



SOT-23 三极管 (SOT-23 TRANSISTORS)

| 型号 TYPE | V _{CB0} V | V _{CEO} V | I _C mA | P _D mW | h _{FE} I _C /V _{CE} | | V _{CE(sat)} I _C /I _B | | f TYPE | 内部 结构 STYLE |
|------------|-----------------------|-----------------------|----------------------|----------------------|---|-----------|---|-----------|-----------|-------------------|
| | | | | | Min/Max | mA/Volts | Max Volts | mA | MHz | |
| FHT20 | 40 | 25 | 25 | 200 | 40 | 7/10 | | | 550 | 6 |
| FHT31 | 30 | 15 | 100 | 200 | 20 | 3/1 | 0.4 | 10/1 | 600 | 6 |
| FHT63 | -110 | -100 | -100 | 225 | 30 | -10/1.0 | -0.25 | -25/-2.5 | 95 | 6 |
| FHT64 | 120 | 80 | 100 | 225 | 20 | 10/1.0 | 0.2 | 50/15 | 60 | 6 |
| FHT599 | 40 | 25 | 25 | 200 | 40 | 7/10 | | | 550 | 6 |
| FHT807-16 | -50 | -45 | -500 | 225 | 100/250 | -100/-1.0 | -0.7 | -500/-50 | 200 | 6 |
| FHT807-25 | -50 | -45 | -500 | 225 | 160/400 | -100/-1.0 | -0.7 | -500/-50 | 200 | 6 |
| FHT807-40 | -50 | -45 | -500 | 225 | 250/600 | -100/-1.0 | -0.7 | -500/-50 | 200 | 6 |
| FHT817-16 | 50 | 45 | 500 | 225 | 100/250 | 100/1.0 | 0.7 | 500/50 | 200 | 6 |
| FHT817-25 | 50 | 45 | 500 | 225 | 160/400 | 100/1.0 | 0.7 | 500/50 | 200 | 6 |
| FHT817-40 | 50 | 45 | 500 | 225 | 250/600 | 100/1.0 | 0.7 | 500/50 | 200 | 6 |
| FHT846A | 80 | 65 | 100 | 225 | 110/220 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT846B | 80 | 65 | 100 | 225 | 200/450 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT847A | 50 | 45 | 100 | 225 | 110/220 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT847B | 50 | 45 | 100 | 225 | 200/450 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT847C | 50 | 45 | 100 | 225 | 420/800 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT848A | 30 | 30 | 100 | 225 | 110/220 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT848B | 30 | 30 | 100 | 225 | 200/450 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT848C | 30 | 30 | 100 | 225 | 420/800 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT849A | 30 | 30 | 100 | 225 | 110/220 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT849B | 30 | 30 | 100 | 225 | 200/450 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT849C | 30 | 30 | 100 | 225 | 420/800 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT850A | 50 | 45 | 100 | 225 | 110/220 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT850B | 50 | 45 | 100 | 225 | 200/450 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT850C | 50 | 45 | 100 | 225 | 420/800 | 2.0/5.0 | 0.6 | 100/5.0 | 100 | 6 |
| FHT856A | -80 | -65 | -100 | 225 | 125/250 | -2.0/-5.0 | -0.65 | -100/-5.0 | 100 | 6 |
| FHT856B | -80 | -65 | -100 | 225 | 220/475 | -2.0/-5.0 | -0.65 | -100/-5.0 | 100 | 6 |
| FHT857A | -50 | -45 | -100 | 225 | 125/250 | -2.0/-5.0 | -0.65 | -100/-5.0 | 100 | 6 |
| FHT857B | -50 | -45 | -100 | 225 | 220/475 | -2.0/-5.0 | -0.65 | -100/-5.0 | 100 | 6 |
| FHT857C | -50 | -45 | -100 | 225 | 420/800 | -2.0/-5.0 | -0.65 | -100/-5.0 | 100 | 6 |
| FHT858A | -30 | -30 | -100 | 225 | 125/250 | -2.0/-5.0 | -0.65 | -100/-5.0 | 100 | 6 |
| FHT858B | -30 | -30 | -100 | 225 | 220/475 | -2.0/-5.0 | -0.65 | -100/-5.0 | 100 | 6 |
| FHT858C | -30 | -30 | -100 | 225 | 420/800 | -2.0/-5.0 | -0.65 | -100/-5.0 | 100 | 6 |
| FHT918 | 30 | 15 | 50 | 225 | 20 | 3.0/1.0 | 0.4 | 10/1.0 | 600 | 6 |
| FHT1298 | -35 | -30 | -800 | 200 | 100/320 | -100/-1 | -0.4 | -500/-20 | 120 | 6 |
| FHT1304 | | 20 | 300 | 200 | 200/800 | 4/2.0 | 0.25 | 100/10 | 60 | 6 |
| FHT1504 | -50 | -50 | -150 | 150 | 70/400 | -2/-6 | -0.3 | -100/-10 | 80 | 6 |
| FHT1505 | | -30 | -500 | 150 | 70/400 | -100/-1 | -0.25 | -100/-10 | 200 | 6 |
| FHT1517 | | -120 | -100 | 150 | 700 | -2/-6 | -0.3 | -10/-1 | | 6 |
| FHT1623 | 60 | 50 | 100 | 300 | 90/600 | 1/6 | 0.3 | 100/10 | 250 | 6 |
| FHT2222 | 60 | 30 | 600 | 200 | 35 | 0.1/10 | 0.4 | 150/15 | 250 | 6 |
| FHT2222A | 75 | 40 | 600 | 200 | 35 | 0.1/10 | 0.3 | 150/15 | 300 | 6 |
| FHT2487 | 60 | 60 | 50 | 225 | 250 | 1.0/5.0 | 0.35 | 10/0.1 | | 6 |
| FHT2875 | | 20 | 300 | 150 | 200/1200 | 4/2.0 | 0.3 | 30/3.0 | 30 | 6 |



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|----------|------|------|------|-----|----------------|-----------|-------|-----------|------|---|
| FHT2907 | -60 | -40 | -600 | 200 | 35 | -0.1/-10 | -0.4 | -150/-15 | 200 | 6 |
| FHT2907A | -60 | -60 | -600 | 200 | 75 | -0.1/-10 | -0.4 | -150/-15 | 200 | 6 |
| FHT3121 | | 15 | 50 | 150 | 60/320 | 8/3.0 | | | 1500 | 6 |
| FHT3265 | 35 | 30 | 800 | 200 | 100/320 | 100/1.0 | 0.5 | 500/20 | 120 | 6 |
| FHT3295 | | 50 | 150 | 150 | 600/3600 | 2.0/6 | 0.25 | 100/10 | 250 | 6 |
| FHT3356 | 20 | 12 | 100 | 300 | 50/300 | 20/10 | 0.5 | 10/5.0 | 7000 | 6 |
| FHT3837 | 30 | 18 | 50 | 300 | 56/390 | 10/10 | 0.5 | 20/4.0 | 1500 | 6 |
| FHT3838 | 20 | 11 | 50 | 300 | 56/390 | 5/10 | 0.5 | 10/5.0 | 3200 | 6 |
| FHT3875 | 60 | 50 | 150 | 150 | 70/700 | 2.0/6 | 0.25 | 100/10 | 80 | 6 |
| FHT3876 | | 30 | 500 | 150 | 70/400 | 100/1 | 0.25 | 100/10 | 300 | 6 |
| FHT3878 | | 30 | 100 | 150 | 40/240 | 2.0/12 | 0.4 | 10/1.0 | 120 | 6 |
| FHT3879 | | 30 | 50 | 150 | 40/240 | 2.0/12 | 0.4 | 10/1.0 | | 6 |
| FHT3880 | 40 | 30 | 20 | 150 | 40/200 | 1.0/6 | | | 550 | 6 |
| FHT3881 | | 25 | 50 | 150 | 20/200 | 10/10.0 | 0.2 | 15/1.5 | 600 | 6 |
| FHT3882 | | 15 | 50 | 150 | 40/200 | 8/3.0 | | | 1100 | 6 |
| FHT3883 | | 15 | 200 | 150 | 55/140 | 10/1.0 | 0.25 | 10/1.0 | | 6 |
| FHT3903 | | 40 | 200 | 200 | 20 | 0.1/1 | 0.2 | 10/1.0 | 300 | 6 |
| FHT3904 | 60 | 40 | 200 | 200 | 40 | 0.1/1 | 0.2 | 10/1.0 | 300 | 6 |
| FHT3905 | | -40 | -200 | 200 | 30 | -0.1/-1 | -0.25 | -10/-1 | 200 | 6 |
| FHT3906 | -40 | -40 | -200 | 200 | 60 | -0.1/-1 | -0.25 | -10/-1 | 250 | 6 |
| FHT3911 | | 120 | 100 | 150 | 700 | 2.0/6 | 0.3 | 10/1.0 | | 6 |
| FHT4400 | | 40 | 600 | 200 | 20 | 1.0/1.0 | 0.4 | 150/15 | 200 | 6 |
| FHT4401 | 60 | 40 | 600 | 200 | 20 | 0.1/1.0 | 0.4 | 150/15 | 250 | 6 |
| FHT4402 | | -40 | -600 | 200 | 30 | -1.0/-1.0 | -0.4 | -150/-15 | 200 | 6 |
| FHT4403 | -40 | -40 | -600 | 200 | 30 | -0.1/-10 | -0.4 | -150/-15 | 200 | 6 |
| FHT5087 | -50 | -50 | -50 | 225 | 250/800 | -0.1/-5.0 | -0.3 | -10/-1.0 | 40 | 6 |
| FHT5088 | 35 | 30 | 50 | 225 | 300/900 | 100/5.0 | 0.5 | 10/1.0 | 50 | 6 |
| FHT5089 | 30 | 25 | 50 | 225 | 400/1200 | 100/5.0 | 0.5 | 10/1.0 | 50 | 6 |
| FHT5400 | | -120 | -600 | 200 | 40/180 | -10/-5 | -0.2 | -10/-1 | | 6 |
| FHT5401 | -160 | -150 | -500 | 225 | 60/360 | -10/-5.0 | -0.5 | -50/-0.5 | 100 | 6 |
| FHT5550 | 160 | 140 | 600 | 225 | 60/250 | 10/5.0 | 0.25 | 50/5.0 | | 6 |
| FHT5551 | 180 | 160 | 600 | 225 | 80/360 | 10/5.0 | 0.2 | 50/5.0 | | 6 |
| FHT6427 | 40 | 40 | 500 | 225 | 10,000/100,000 | 10/5.0 | 1.2 | 50/0.5 | | 6 |
| FHT6428 | 60 | 50 | 200 | 225 | 250/650 | 0.1/0.5 | 0.6 | 100/5.0 | 100 | 6 |
| FHT6429 | 55 | 45 | 200 | 225 | 500/1250 | 0.1/0/5 | 0.6 | 100/5.0 | 100 | 6 |
| FHT6517 | 350 | 350 | 500 | 225 | 30/200 | 30/10 | 1 | 50/5.0 | 40 | 6 |
| FHT6520 | -350 | -350 | -500 | 225 | 30/200 | -30/-10 | -1 | -50/-5.0 | 40 | 6 |
| FHT8050 | 40 | 25 | 800 | 200 | 85/300 | 100/1.0 | 0.6 | 500/50 | 120 | 6 |
| FHT8550 | -40 | -25 | -800 | 200 | 85/300 | -100/-1 | -0.6 | -500/-50 | 120 | 6 |
| FHT8599 | -80 | -80 | -500 | 225 | 100/300 | -1.0/-5.0 | -0.4 | -100/-5.0 | 150 | 6 |
| FHT9011 | 40 | 30 | 50 | 150 | 40/240 | 2.0/12 | 0.4 | 10/1.0 | | 6 |
| FHT9012 | -40 | -30 | -500 | 150 | 70/400 | -100/-1 | -0.6 | -500/-50 | 200 | 6 |
| FHT9013 | 40 | 30 | 500 | 150 | 70/400 | 100/1 | 0.6 | 500/50 | 300 | 6 |
| FHT9014 | 50 | 45 | 150 | 150 | 70/700 | 2.0/6 | 0.6 | 100/5 | 180 | 6 |
| FHT9015 | -50 | -45 | -150 | 150 | 70/400 | -2/-6 | -0.6 | -100/-5 | 200 | 6 |
| FHT9016 | | 19 | 20 | 150 | 40/200 | 1.0/5 | 0.6 | 10/1 | 300 | 6 |
| FHT9018 | 30 | 19 | 50 | 150 | 40/300 | 1.0/5 | 0.6 | 10/1 | 1000 | 6 |
| FHTA05 | 60 | 60 | 500 | 225 | 100 | 10/1.0 | 0.25 | 100/10 | 100 | 6 |



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|---------|------|-----------------------|------|-----|---------|-----------|-------|-----------|------|---|
| FHTA06 | 80 | 80 | 500 | 225 | 100 | 10/1.0 | 0.25 | 100/10 | 100 | 6 |
| FHTA13 | 30 | V _{CES} =30 | 300 | 225 | 5000 | 10/5.0 | 1.5 | 100/0.1 | 125 | 6 |
| FHTA14 | 30 | V _{CES} =30 | 300 | 225 | 10,000 | 10/5.0 | 1.5 | 100/0.1 | 125 | 6 |
| FHTA20 | | 40 | 100 | 225 | 40/400 | 5.0/10 | 0.25 | 10/1.0 | 125 | 6 |
| FHTA42 | 300 | 300 | 500 | 225 | 40 | 10/10 | 0.5 | 20/2 | 50 | 6 |
| FHTA43 | 200 | 200 | 500 | 225 | 40 | 10/10 | 0.5 | 20/2 | 50 | 6 |
| FHTA44 | 400 | 400 | 100 | 225 | 70/200 | 10/10 | 0.5 | 100/10 | 50 | 6 |
| FHTA55 | -60 | -60 | -500 | 225 | 100 | -10/-1.0 | -0.25 | -100/-10 | 50 | 6 |
| FHTA56 | -80 | -80 | -500 | 225 | 100 | -10/-1.0 | -0.25 | -100/-10 | 50 | 6 |
| FHTA63 | -30 | V _{CES} =-30 | -500 | 225 | 5,000 | -10/5.0 | -1.5 | -100/-0.1 | 125 | 6 |
| FHTA64 | -30 | V _{CES} =-30 | -500 | 225 | 10,000 | -10/5.0 | -1.5 | -100/-0.1 | 125 | 6 |
| FHTA70 | | -40 | -100 | 225 | 40/400 | -5.0/-10 | -0.25 | -10/-1.0 | 125 | 6 |
| FHTA92 | -300 | -300 | -500 | 225 | 25 | -30/-10 | -0.5 | -20/-2.0 | 50 | 6 |
| FHTA93 | -200 | -200 | -500 | 225 | 25 | -30/-10 | -0.5 | -20/-2.0 | 50 | 6 |
| FHTA517 | 40 | 30 | 400 | 200 | 30,000 | 100/2 | 1 | 100/1 | 220 | 6 |
| FHTH10 | 30 | 25 | | 225 | 60 | 4.0/10 | 0.5 | 4.0/0.4 | 650 | 6 |
| FHTH24 | 40 | 30 | 50 | 225 | 30 | 8.0/10 | | | 620 | 6 |
| FHTH69 | -15 | -15 | | 225 | 30/300 | -10/-10 | | | 2000 | 6 |
| FHTH81 | -20 | -20 | | 225 | 60 | -5.0/-10 | -0.5 | -5.0/-0.5 | 600 | 6 |
| FHTV71 | 60 | 60 | 100 | 200 | 110/220 | 2/5 | 0.25 | 10/0.5 | 300 | 6 |
| FHTV72 | 60 | 60 | 100 | 200 | 200/450 | 2/5 | 0.25 | 10/0.5 | 300 | 6 |
| FHTW29 | -32 | -32 | -100 | 225 | 120/260 | -2/-5 | -0.3 | -10/-0.5 | | 6 |
| FHTW30 | -32 | -32 | -100 | 225 | 215/500 | -2/-5 | -0.3 | -10/-0.5 | | 6 |
| FHTW31 | 30 | 20 | 100 | 225 | 110/220 | 2/5 | 0.25 | 10/0.5 | | 6 |
| FHTW32 | 30 | 20 | 100 | 225 | 200/450 | 2/5 | 0.25 | 10/0.5 | | 6 |
| FHTW33 | 30 | 20 | 100 | 225 | 420/800 | 2/5 | 0.25 | 10/0.5 | | 6 |
| FHTW60A | 32 | 32 | 100 | 225 | 120/200 | 2/5 | 0.55 | 50/1.25 | 125 | 6 |
| FHTW60B | 32 | 32 | 100 | 225 | 175/310 | 2/5 | 0.55 | 50/1.25 | 125 | 6 |
| FHTW60D | 32 | 32 | 100 | 225 | 380/630 | 2/5 | 0.55 | 50/1.25 | 125 | 6 |
| FHTW61B | -32 | -32 | -100 | 225 | 140/310 | -2/-5 | -0.55 | -50/-1.25 | | 6 |
| FHTW61C | -32 | -32 | -100 | 225 | 250/460 | -2/-5 | -0.55 | -50/-1.25 | | 6 |
| FHTW61D | -32 | -32 | -100 | 225 | 380/630 | -2/-5 | -0.55 | -50/-1.25 | | 6 |
| FHTW65A | 60 | 32 | 800 | 225 | 75/220 | 10/1.0 | 0.7 | 500/50 | 100 | 6 |
| FHTW68F | -60 | -45 | -800 | 225 | 75/250 | -10/-1 | -1.5 | -300/-30 | 100 | 6 |
| FHTW68G | -60 | -45 | -800 | 225 | 120/400 | -10/-1 | -1.5 | -300/-30 | 100 | 6 |
| FHTW69 | -50 | -45 | -100 | 225 | 120/260 | -2.0/-5.0 | -0.3 | -10/-0.5 | | 6 |
| FHTW70 | -50 | -45 | -100 | 225 | 215/500 | -2.0/-5.0 | -0.3 | -10/-0.5 | | 6 |
| FHTW71 | 50 | 45 | 100 | 225 | 110/220 | 2.0/5.0 | 0.25 | 10/0.5 | 300 | 6 |
| FHTW72 | 50 | 45 | 100 | 225 | 200/450 | 2.0/5.0 | 0.25 | 10/0.5 | 300 | 6 |
| FHTW89 | -60 | -60 | -100 | 200 | 120/260 | -2.0/-5.0 | -0.3 | -10/-0.5 | | 6 |
| FHTX17 | -50 | -45 | -800 | 225 | 100/600 | -100/-1.0 | -0.62 | -500/-50 | | 6 |
| FHTX18 | -30 | -25 | -500 | 225 | 100/600 | -100/-1.0 | -0.62 | -500/-50 | | 6 |
| FHTX19 | 50 | 45 | 500 | 225 | 100/600 | 100/1.0 | 0.62 | 500/50 | | 6 |
| FHTX20 | 30 | 25 | 500 | 225 | 100/600 | 100/1.0 | 0.62 | 500/50 | | 6 |
| FHTX70G | 45 | 45 | 200 | 225 | 120/220 | 2.0/5.0 | 0.35 | 10/0.25 | 125 | 6 |
| FHTX70J | 45 | 45 | 500 | 225 | 250/460 | 2.0/5.0 | 0.35 | 10/0.25 | 125 | 6 |
| FHTX70K | 45 | 45 | 500 | 225 | 380/630 | 2.0/5.0 | 0.35 | 10/0.25 | 125 | 6 |



General Purpose Transistors 三极管

PNP Silicon (FHT1015)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ.)$

Low Noise 低噪声: $NF=1dB(Typ.), 10dB(Max.)$

Complementary to FHT1815 与 FHT1815 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -50 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -50 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -150 | mAdc |
| Base Current 基极电流 | I_B | -30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT1015O=TO(70 ~ 140), FHT1015Y=TY(120 ~ 240), FHT1015G=TG(200 ~ 400)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-50V, I_E=0$ | — | — | -0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=-5V, I_C=0$ | — | — | -0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0mA$ | -50 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-100\mu A$ | -50 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-100\mu A$ | -5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=-6V, I_C=-2mA$ | 70 | — | 400 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-100mA, I_B=-10mA$ | — | — | -0.3 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=-5.0V, I_C=-10mA$ | — | — | -0.82 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-5.0V, I_C=-10mA$ | 100 | 200 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=-10V, I_E=0, f=1MHz$ | — | 4.0 | 7.0 | pF |



General Purpose Transistors 三极管

NPN Silicon (FHT1815)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ.)$

High 高 $h_{FE}:h_{FE}=70 \sim 700$

Low Noise 低噪声: $NF=1dB(Typ.), 10dB(Max.)$

Complementary to FHT1015 与 FHT1015 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 50 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 60 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 150 | mAdc |
| Base Current 基极电流 | I_B | 30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT1815O=BO(70 ~ 140), FHT1815Y=BY(120 ~ 240)
 FHT1815G=BG(200 ~ 400), FHT1815L=BL(350 ~ 700)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-----------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=60V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=5V, I_C=0$ | — | — | 0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 50 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 60 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=6V, I_C=2mA$ | 70 | — | 700 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=100mA, I_B=10mA$ | — | — | 0.25 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=5.0V, I_C=10mA$ | — | — | 0.82 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=5.0V, I_C=10mA$ | 100 | 180 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0, f=1MHz$ | — | 4.0 | 7.0 | pF |



General Purpose Transistors 三极管

PNP Silicon (FHT1037)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ.)$

Low Noise 低噪声: $NF=1dB(Typ.), 10dB(Max.)$

Complementary to FHT2412 与 FHT2412 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -50 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -60 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -6.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -150 | mAdc |
| Base Current 基极电流 | I_B | -30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 200 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)FHT1037Q=FQ(120 \sim 270), FHT1037R=FR(180 \sim 390), FHT1037S=FS(270 \sim 560)$

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|---------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-60V, I_E=0$ | — | — | -0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=-6V, I_C=0$ | — | — | -0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0mA$ | -50 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-50\mu A$ | -60 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-50\mu A$ | -6 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=-6V, I_C=-1mA$ | 120 | — | 560 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-50mA, I_B=-5mA$ | — | — | -0.5 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-12V, I_E=2mA, f=30MHz$ | — | 140 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=-12V, I_E=0, f=1MHz$ | — | 4.0 | 5.0 | pF |



General Purpose Transistors 三极管

NPN Silicon (FHT2412)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95$ (Typ.)

Low Noise 低噪声: $NF=1dB$ (Typ.), $10dB$ (Max.).

Complementary to FHT1037 与 FHT1037 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 50 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 60 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 7.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 150 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 200 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT2412Q=BQ(120 ~ 270) , FHT2412R=BR(180 ~ 390) ,
FHT2412S=BS(270 ~ 560)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|---------------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=60V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=7V, I_C=0$ | — | — | 0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 50 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=50\mu A$ | 60 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=50\mu A$ | 7 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=6V, I_C=1mA$ | 120 | — | 560 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=50mA, I_B=5mA$ | — | — | 0.4 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=12V, I_E=-2mA,$ $f=100MHz$ | — | 180 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=12V, I_E=0, f=1MHz$ | — | 2.0 | 3.5 | pF |



General Purpose Transistors 三极管 PNP Silicon (FHT1504)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ.)$

Low Noise 低噪声: $NF=1dB(Typ.), 10dB(Max.)$.

Complementary to FHT3875 与 FHT3875 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -50 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -50 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -150 | mAdc |
| Base Current 基极电流 | I_B | -30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT1504O=SO(70 ~ 140), FHT1504Y=SY(120 ~ 240), FHT1504G=SG(200 ~ 400)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-50V, I_E=0$ | — | — | -0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=-5V, I_C=0$ | — | — | -0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0mA$ | -50 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-100\mu A$ | -50 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-100\mu A$ | -5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=-6V, I_C=-2mA$ | 70 | — | 400 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-100mA, I_B=-10mA$ | — | — | -0.3 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=-5.0V, I_C=-10mA$ | — | — | -0.82 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-5.0V, I_C=-10mA$ | 100 | 200 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=-10V, I_E=0, f=1MHz$ | — | 4.0 | 7.0 | pF |



General Purpose Transistors 三极管

NPN Silicon (FHT3875)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ.)$

High 高 $h_{FE}:h_{FE}=70 \sim 700$

Low Noise 低噪声: $NF=1dB(Typ.), 10dB(Max.)$.

Complementary to FHT1504 与 FHT1504 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 50 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 60 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 150 | mAdc |
| Base Current 基极电流 | I_B | 30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT3875O=AO(70 ~ 140), FHT3875Y=AY(120 ~ 240)
FHT3875G=AG(200 ~ 400), FHT3875L=AL(350 ~ 700)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|----------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=60V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=5V, I_C=0$ | — | — | 0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 50 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 60 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=6V, I_C=2mA$ | 70 | — | 700 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和电压 | $V_{CE(sat)}$ | $I_C=100mA, I_B=10mA$ | — | — | 0.25 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=5.0V, I_C=10mA$ | — | — | 0.82 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=5.0V, I_C=10mA$ | 100 | 180 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0,$ $f=1MHz$ | — | 4.0 | 7.0 | pF |



General Purpose Transistors 三极管

PNP Silicon (FHTA1514)

FEATURES 特点

High Breakdown Voltage ($V_{CE0}=-120V$) 击穿电压高 ($V_{CE0}=-120V$).

Complementary to FHTC3906 与 FHTC3906 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CE0} | -120 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -120 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -50 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHTA1514R=SR(180 ~ 390), FHTA1514S=SS(270 ~ 560)

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|--------------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-100V, I_E=0$ | — | — | -0.5 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=-4V, I_C=0$ | — | — | -0.5 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0mA$ | -120 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-50\mu A$ | -120 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-50\mu A$ | -5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=-6V, I_C=-2mA$ | 180 | — | 560 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-10mA, I_B=-1mA$ | — | — | -0.5 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-12V, I_E=2mA,$ $f=30MHz$ | — | 140 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=-12V, I_E=0,$ $f=1MHz$ | — | 3.2 | — | pF |



General Purpose Transistors 三极管 NPN Silicon (FHTC3906)

FEATURES 特点

High Breakdown Voltage ($BV_{CEO} = 120V$) 击穿电压高 ($BV_{CEO} = 120V$).
Complementary to FHTA1514 与 FHTA1514 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 120 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 120 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 50 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHTC3906R=TR(180 ~ 390), FHTC3906S=TS(270 ~ 560)

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|---|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB} = 100V, I_E = 0$ | — | — | 0.5 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB} = 4V, I_C = 0$ | — | — | 0.5 | μA |
| Collector Base Breakdown Voltage 集电极 基极击穿电压 | $V_{(BR)CBO}$ | $I_C = 50\mu A$ | 120 | — | — | V |
| Collector Emitter Breakdown Voltage 集电极 发射极击穿电压 | $V_{(BR)CEO}$ | $I_C = 1.0mA$ | 120 | — | — | V |
| Emitter Base Breakdown Voltage 发射极 基极击穿电压 | $V_{(BR)EBO}$ | $I_E = 50\mu A$ | 5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE} = 6V, I_C = 2mA$ | 180 | — | 560 | — |
| Collector Emitter Saturation Voltage 集电极 发射极饱和压降 | $V_{CE(sat)}$ | $I_C = 10mA, I_B = 1mA$ | — | — | 0.5 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE} = 12V, I_E = -2mA,$ $f = 100MHz$ | — | 140 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB} = 12V, I_E = 0, f = 1MHz$ | — | 2.5 | — | pF |



General Purpose Transistors 三极管

PNP Silicon (FHT807-16,FHT807-25,FHT807-40)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -45 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -50 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -500 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|---------------------|--------------------|---------|
| Total Device Dissipation 总耗散功率 FR-5Board(1) ($T_A=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_A=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | $T_J,$ T_{stg} | 150 -55 to +150 | |

DEVICE MARKING 打标

FHT807-16=5A(100~250),FHT807-25=5B(160~400),FHT807-40=5C(250~600)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|--|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB} = -20Vdc$ | — | | -100 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C = -10 mAdc, I_B = 0$ | -45 | — | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C = -10 \mu Adc, I_E = 0$ | -50 | — | — | Vdc |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E = -1.0 \mu Adc, I_C = 0$ | -5.0 | — | — | Vdc |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $I_C = -100mAdc, V_{CE} = -1.0Vdc$ | 100 | — | 600 | — |
| | $h_{FE}(2)$ | $I_C = -500mAdc, V_{CE} = -1.0Vdc$ | 40 | — | — | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C = -500mAdc, I_B = -50mAdc$ | — | — | -0.7 | Vdc |
| Base-Emitter On Voltage 基极-发射极导通电压 | $V_{BE(on)}$ | $I_C = -500mAdc, V_{CE} = -1.0Vdc$ | — | — | -1.2 | Vdc |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C = -10mAdc, V_{CE} = -5.0Vdc,$ $f = 100MHz$ | 100 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB} = -10Vdc, I_E = 0, f = 1.0MHz$ | — | — | 10 | pF |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μ s; Duty Cycle 2.0%.



General Purpose Transistors 三极管

NPN Silicon (FHT817-16,FHT817-25,FHT817-40)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 45 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 50 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 500 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|-----------------------|--------------------|---------|
| Total Device Dissipation 总耗散功率 FR-5Board(1) ($T_A=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_A=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | $T_{J,}$ T_{stg} | 150 -55 to +150 | |

DEVICE MARKING 打标

FHT817-16=6A(100~250),FHT817-25=6B(160~400),FHT817-40=6C(250~600)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|--|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB} = 20Vdc$ | — | | 100 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=10\text{ mAdc}, I_B=0$ | 45 | — | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=10\ \mu\text{ Adc}, I_E=0$ | 50 | — | — | Vdc |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=1.0\ \mu\text{ Adc}, I_C=0$ | 5.0 | — | — | Vdc |
| DC Current Gain 直流电流增益 | $h_{FE(1)}$ | $I_C=100\text{mAdc}, V_{CE}=1.0Vdc$ | 100 | — | 600 | — |
| | $h_{FE(2)}$ | $I_C=500\text{mAdc}, V_{CE}=1.0Vdc$ | 40 | — | — | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=500\text{mAdc}, I_B=50\text{mAdc}$ | — | — | 0.7 | Vdc |
| Base-Emitter On Voltage 基极-发射极导通电压 | $V_{BE(on)}$ | $I_C=500\text{mAdc}, V_{CE}=1.0Vdc$ | — | — | 1.2 | Vdc |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C=10\text{mAdc}, V_{CE}=5.0Vdc,$ $f=100\text{MHz}$ | 100 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB}=10Vdc, I_E=0, f=1.0\text{MHz}$ | — | — | 10 | pF |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μ s; Duty Cycle 2.0%.



General Purpose Transistors 三极管

NPN Silicon (FHT846A,FHT846B,FHT847A,FHT847B,FHT847C,FHT848A,FHT848B,FHT848C)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | | Rating 额定值 | Unit 单位 |
|--|-----------|--------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | FHT846 | 65 | Vdc |
| | | FHT847 | 45 | |
| | | FHT848 | 30 | |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | FHT846 | 80 | Vdc |
| | | FHT847 | 50 | |
| | | FHT848 | 30 | |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | FHT846 | 6 | Vdc |
| | | FHT847 | 6 | |
| | | FHT848 | 5 | |
| Collector Current—Continuous 集电极电流-连续 | I_c | | 100 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|-----------|-------------|---------|
| Total Device Dissipation 总耗散功率 FR-5 Board(1) ($T_a=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_a=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | $T_J,$ | 150 | |
| | T_{stg} | -55 to +150 | |

DEVICE MARKING 打标

FHT846A=1M (110~220),FHT846B=1N(200~450),
FHT847A=1E (110~220),FHT847B=1F(200~450),FHT847C=1H(420~800),
FHT848A=1J (110~220),FHT848B=1K(200~450),FHT848C=1T(420~800)

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|---|---------------|---------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB} = 30Vdc$ | — | — | 15 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_c=10$ mAdc, $I_B=0$ | FHT846 | — | — | Vdc |
| | | | FHT847 | 65 | — | |
| | | | FHT848 | 45 | — | |
| | | | 30 | | | |



ELECTRICAL CHARACTERISTICS 电特性 (Continued 续前页)

| | | | | | | | |
|--|---------------|--------|--|-----|-----|------|-----|
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | FHT846 | $I_C=10\mu A_{dc}$, $I_E=0$ | 80 | — | — | Vdc |
| | | FHT847 | | 50 | | | |
| | | FHT848 | | 30 | | | |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | FHT846 | $I_E=10\mu A_{dc}$, $I_C=0$ | 6.0 | — | — | Vdc |
| | | FHT847 | | 6.0 | | | |
| | | FHT848 | | 5.0 | | | |
| DC Current Gain 直流电流增益 | h_{FE} | FHT846 | $I_C=2.0mA_{dc}$, $V_{CE}=5.0V_{dc}$ | 110 | — | 450 | — |
| | | FHT847 | | 110 | | 800 | — |
| | | FHT848 | | 110 | | 800 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | | $I_C=10mA_{dc}$, $I_B=0.5mA_{dc}$ | — | — | 0.25 | Vdc |
| | | | $I_C=100mA_{dc}$, $I_B=5.0mA_{dc}$ | — | | 0.6 | |
| Base-Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | | $I_C=10mA_{dc}$, $I_B=0.5mA_{dc}$ | — | 0.7 | — | Vdc |
| | | | $I_C=100mA_{dc}$, $I_B=5.0mA_{dc}$ | — | 0.9 | — | |
| Base-Emitter On Voltage 基极-发射极导通电压 | $V_{BE(on)}$ | | $I_C=2.0mA_{dc}$, $V_{CE}=5.0V_{dc}$ | 580 | 660 | 700 | mV |
| | | | $I_C=10mA_{dc}$, $V_{CE}=5.0V_{dc}$ | — | — | 770 | |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | | $I_C=10mA_{dc}$, $V_{CE}=5.0V_{dc}$, $f=100MHz$ | 100 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | | $V_{CB}=10V_{dc}$, $I_E=0, f=1.0MHz$ | — | — | 4 | pF |
| Noise Figure 噪声系数 | NF | | $R_S=2.0k\Omega$, BW=200Hz, $V_{CE}=5.0V_{dc}$, $I_C=200\mu A_{dc}$, $f=1.0KHz$ | — | — | 10.0 | dB |

1. FR-5=1.0 × 0.75 × 0.062 in.
2. Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
3. Pulse Width 300 μs; Duty Cycle 2.0%.



General Purpose Transistors 三极管

NPN Silicon (FHT849A,FHT849B,FHT849C)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 30 | Vdc |
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 30 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 100 | mAdc |
| Base Current 基极电流 | I_B | 30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

FHT849A=1E(110~220),FHT849B=1F(200~450),FHT849C=1H(420~800)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-----------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=50V, I_E=0$ | — | — | 15 | nA |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=10mA$ | 30 | — | — | V |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=10\mu A$ | 30 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=1.0\mu A$ | 5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=5V, I_C=2mA$ | 110 | — | 800 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=10mA, I_B=0.5mA$ | — | — | 0.25 | V |
| | | $I_C=100mA, I_B=5mA$ | — | — | 0.6 | |
| Base-Emitter Voltage 基极-发射极电压 | $V_{BE(sat)}$ | $I_B=0.5mA, I_C=10mA$ | — | 0.70 | — | V |
| | | $I_B=5.0mA, I_C=100mA$ | — | 0.90 | — | |
| Base-Emitter on Voltage 基极-发射极导通电压 | $V_{BE(on)}$ | $V_{CE}=5.0V, I_C=2.0mA$ | 580 | 660 | 700 | mV |
| | | $V_{CE}=5.0V, I_C=10mA$ | | | 770 | |
| Transition Frequency 特征频率 | f_T | $V_{CE}=5.0V, I_C=10mA$ | 100 | — | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0, f=1MHz$ | — | 4.0 | 7.0 | pF |



General Purpose Transistors 三极管

PNP Silicon (FHT856A,FHT856B,FHT857A,FHT857B,FHT857C,FHT858A,FHT858B,FHT858C)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | | Rating 额定值 | Unit 单位 |
|--|-----------|--------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | FHT856 | -65 | Vdc |
| | | FHT857 | -45 | |
| | | FHT858 | -30 | |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | FHT856 | -80 | Vdc |
| | | FHT857 | -50 | |
| | | FHT858 | -30 | |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | FHT856 | -5 | Vdc |
| | | FHT857 | -5 | |
| | | FHT858 | -5 | |
| Collector Current—Continuous 集电极电流-连续 | I_c | | -100 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|-----------|-------------|---------|
| Total Device Dissipation 总耗散功率 FR-5 Board(1) ($T_a=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_a=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | $T_J,$ | 150 | |
| | T_{stg} | -55 to +150 | |

DEVICE MARKING 打标

FHT856A=3A (110~220),FHT856B=3B(200~450),
FHT857A=3E (110~220),FHT857B=3F(200~450),FHT857C=3H(420~800),
FHT858A=3J (110~220),FHT858B=3K(200~450),FHT858C=3T(420~800)

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|---|---------------|--------|--------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | | $V_{CB} = -30Vdc$ | — | — | -15 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | FHT856 | $I_c = -10$ mAdc, $I_B = 0$ | -65 | — | — | Vdc |



ELECTRICAL CHARACTERISTICS 电特性 (Continued 续前页)

| | | | | | | | |
|---|---------------|--------|---|------|------|-------|-----|
| | | FHT857 | | -45 | | | |
| | | FHT858 | | -30 | | | |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | FHT856 | $I_C = -10 \mu A_{dc}$, $I_E = 0$ | -80 | — | — | Vdc |
| | | FHT857 | | -50 | | | |
| | | FHT858 | | -30 | | | |
| | | | | | | | |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | FHT856 | $I_E = -10 \mu A_{dc}$, $I_C = 0$ | -5.0 | — | — | Vdc |
| | | FHT857 | | -5.0 | | | |
| | | FHT858 | | -5.0 | | | |
| DC Current Gain 直流电流增益 | h_{FE} | FHT856 | $I_C = -2.0 mA_{dc}$, $V_{CE} = -5.0 V_{dc}$ | 110 | — | 450 | — |
| | | FHT857 | | 110 | | 800 | — |
| | | FHT858 | | 110 | | 800 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | | $I_C = -10 mA_{dc}$, $I_B = -0.5 mA_{dc}$ | — | — | -0.3 | Vdc |
| | | | $I_C = -100 mA_{dc}$, $I_B = -5.0 mA_{dc}$ | — | — | -0.65 | |
| Base-Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | | $I_C = -10 mA_{dc}$, $I_B = -0.5 mA_{dc}$ | — | -0.7 | — | Vdc |
| | | | $I_C = -100 mA_{dc}$, $I_B = -5.0 mA_{dc}$ | — | -0.9 | — | |
| Base-Emitter On Voltage 基极-发射极导通电压 | $V_{BE(on)}$ | | $I_C = -2.0 mA_{dc}$, $V_{CE} = -5.0 V_{dc}$ | -600 | — | -750 | mV |
| | | | $I_C = -10 mA_{dc}$, $V_{CE} = -5.0 V_{dc}$ | — | — | -820 | |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | | $I_C = -10 mA_{dc}$, $V_{CE} = -5.0 V_{dc}$, $f = 100 MHz$ | 100 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | | $V_{CB} = -10 V_{dc}$, $I_E = 0, f = 1.0 MHz$ | — | — | 4 | pF |
| Noise Figure 噪声系数 | NF | | $R_S = 2.0 k \Omega$, $BW = 200 Hz$, $V_{CE} = -5.0 V_{dc}$, $I_C = -200 \mu A_{dc}$, $f = 1.0 KHz$ | — | — | 10.0 | dB |

1. FR-5=1.0 × 0.75 × 0.062 in.
2. Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
3. Pulse Width 300 μs; Duty Cycle 2.0%.



General Purpose Transistors 三极管

NPN Silicon (FHTA06)

FEATURES 特点

Complementary to FHTA56 与 FHTA56 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 80 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 80 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 4.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 500 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHTA06=1GM

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|---|---------------|--------------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=80V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{CEO} | $V_{CE}=60V, I_C=0$ | — | — | 0.1 | μA |
| Collector Emitter Breakdown Voltage 集电极发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 80 | — | — | V |
| Emitter Base Breakdown Voltage 发射极基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 4.0 | — | — | V |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $V_{CE}=1V, I_C=10mA$ | 100 | — | — | — |
| | $h_{FE}(2)$ | $V_{CE}=1V, I_C=100mA$ | 100 | — | — | |
| Collector Emitter Saturation Voltage 集电极发射极饱和压降 | $V_{CE(sat)}$ | $I_C=100mA, I_B=10mA$ | — | — | 0.25 | V |
| Base Emitter Voltage 基极发射极电压 | V_{BE} | $V_{CE}=1V, I_C=100mA$ | — | — | 1.2 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=2V, I_C=10mA,$ $f=100MHz$ | 100 | — | — | MHz |



General Purpose Transistors 三极管

NPN Silicon (FHTA06R)

FEATURES 特点

Complementary to FHTA56R 与 FHTA56R 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 80 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 80 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 4.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 500 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHTA06R=1GM

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|---|---------------|--------------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=80V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{CEO} | $V_{CE}=60V, I_C=0$ | — | — | 1 | μA |
| Collector Emitter Breakdown Voltage 集电极发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 80 | — | — | V |
| Emitter Base Breakdown Voltage 发射极基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 4.0 | — | — | V |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $V_{CE}=1V, I_C=10mA$ | 100 | — | — | — |
| | $h_{FE}(2)$ | $V_{CE}=1V, I_C=100mA$ | 100 | — | — | |
| Collector Emitter Saturation Voltage 集电极发射极饱和压降 | $V_{CE(sat)}$ | $I_C=100mA, I_B=10mA$ | — | — | 0.25 | V |
| Base Emitter Voltage 基极发射极电压 | V_{BE} | $V_{CE}=1V, I_C=100mA$ | — | — | 1.2 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=2V, I_C=10mA,$ $f=100MHz$ | 100 | — | — | MHz |



General Purpose Transistors 三极管

PNP Silicon (FHTA56)

FEATURES 特点

Complementary to FHTA06 与 FHTA06 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -80 | Vdc |
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -80 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -4.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -500 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHTA56=2GM

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|---|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-80V, I_E=0$ | — | | -0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{CEO} | $V_{CE}=-60V, I_C=0$ | — | | -0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0mA$ | -80 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-1.0 mA$ | -80 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-100\mu A$ | -4.0 | — | — | V |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $V_{CE}=-1V, I_C=-10mA$ | 100 | — | — | — |
| | $h_{FE}(2)$ | $V_{CE}=-1V, I_C=-100mA$ | 100 | — | — | |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-100mA, I_B=-10mA$ | — | — | 0.25 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=-1V, I_C=-100mA$ | — | — | -1.2 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-1V, I_C=-100mA,$ $f=100MHz$ | 50 | — | — | MHz |



General Purpose Transistors 三极管

PNP Silicon (FHTA56R)

FEATURES 特点

Complementary to FHTA06R 与 FHTA06R 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -80 | Vdc |
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -80 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -4.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -500 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

| |
|-------------------------|
| $h_{FE}(1)$ FHTA56R=R2G |
|-------------------------|

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|------------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-80V, I_E=0$ | — | — | -0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{CEO} | $V_{CE}=-80V, I_C=0$ | — | — | -1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0mA$ | -80 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-1.0mA$ | -80 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-100\mu A$ | -4.0 | — | — | V |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $V_{CE}=-1V, I_C=-10mA$ | 100 | — | — | — |
| | $h_{FE}(2)$ | $V_{CE}=-1V, I_C=-100mA$ | 100 | — | — | |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-100mA, I_B=-10mA$ | — | — | 0.25 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=-1V, I_C=-100mA$ | — | — | -1.2 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-1V, I_C=-100mA, f=100MHz$ | 50 | — | — | MHZ |



High Voltage Transistors 高压三极管

PNP Silicon (FHT5401)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|-------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -150 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -160 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5.0 | mAdc |
| Collector Current 集电极电流 | I_C | -500 | mAdc |

THERMAL CHARACTERISTICS 热特性

| CHARACTERISTIC 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|---------------|----------|---------|
| Total power dissipation 总耗散功率 ($T_{amb} \leq 25$ C; note 1) | P_D | 225 | mW |
| storage temperature 储存温度 | T_{stg} | -65 +150 | |
| junction temperature 结温 | T_j | 150 | |
| operating ambient temperature 工作环境温度 | T_{amb} | -65 +150 | |
| Thermal resistance from junction to ambient 热阻 (note 1) | $R_{th\ j-a}$ | 556 | K/W |

1. Transistor mounted on an FR-5 printed-circuit board.

DEVICE MARKING 打标

FHT5401=2L

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Max 最大值 | Unit 单位 |
|---|---------------|------------------------------------|---------|---------|---------|
| Collector cut-off current 集电极截止电流 | I_{CBO} | $V_{CB} = -120Vdc, I_E = 0$ | — | -50 | nA |
| Emitter cut-off current 发射极截止电流 | I_{EBO} | $V_{EB} = -4.0Vdc, I_C = 0$ | — | -50 | nA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C = -1.0\ mAdc, I_B = 0$ | -150 | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C = -100\ \mu\ Adc, I_E = 0$ | -160 | — | Vdc |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E = -10\ \mu\ Adc, I_C = 0$ | -5.0 | — | Vdc |
| DC current gain 直流电流增益 | h_{FE} | $I_C = -1.0mAdc, V_{CE} = -5.0Vdc$ | 50 | — | — |
| | | $I_C = -10mAdc, V_{CE} = -5.0Vdc$ | 60 | 360 | — |
| | | $I_C = -50mAdc, V_{CE} = -5.0Vdc$ | 50 | — | — |
| Collector-emitter saturation voltage 集电极-发射极饱和压降 | V_{CEsat} | $I_C = -10mAdc, I_B = -1.0mAdc$ | — | -0.2 | Vdc |
| | | $I_C = -50mAdc, I_B = -5.0mAdc$ | — | -0.5 | Vdc |
| Base-Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | $I_C = -10mAdc, I_B = -1.0mAdc$ | — | -1.0 | Vdc |
| | | $I_C = -50mAdc, I_B = -5.0mAdc$ | — | -1.0 | Vdc |



SMALL-SIGNAL CHARACTERISTICS 小信号特性

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|---|-----------|--|---------|----------|---------|---------|
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C=-10\text{mA dc}, V_{CE}=-10\text{V dc},$ $f=100\text{MHz}$ | 100 | — | 300 | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB}=-10.0\text{V dc},$ $I_E=0, f=1.0\text{MHz}$ | — | — | 6.0 | pF |
| Small-Signal Current Gain 小信号电流增益 | h_{fe} | $V_{CE}=-10\text{V dc},$ $I_C=-1.0\text{mA dc}, f=1.0\text{KHz}$ | 40 | — | 300 | — |
| Noise Figure 噪声系数 | NF | $V_{CE}=-5.0\text{V dc}, I_C=-200$ $\mu\text{A dc}, R_S=1.0\text{k}$ $f=1.0\text{KHz}$ | — | — | 8.0 | dB |



High Voltage Transistors 高压三极管

NPN Silicon (FHT5551)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|-------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 160 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 180 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 6.0 | mAdc |
| Collector Current 集电极电流 | I_C | 600 | mAdc |

THERMAL CHARACTERISTICS 热特性

| CHARACTERISTIC 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|---------------|----------|---------|
| Total power dissipation 总耗散功率 ($T_{amb} \leq 25$ C; note 1) | P_D | 225 | mW |
| storage temperature 储存温度 | T_{stg} | -65 +150 | |
| junction temperature 结温 | T_j | 150 | |
| operating ambient temperature 工作环境温度 | T_{amb} | -65 +150 | |
| thermal resistance from junction to ambient 热阻 (note 1) | $R_{th\ j-a}$ | 556 | K/W |

1. Transistor mounted on an FR-5 printed-circuit board.

DEVICE MARKING 打标

FHT5551=G1`

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Max 最大值 | Unit 单位 |
|---|---------------|------------------------------------|---------|---------|---------|
| collector cut-off current 集电极截止电流 | I_{CBO} | $V_{CB} = 120Vdc, I_E = 0$ | — | 50 | nA |
| emitter cut-off current 发射极截止电流 | I_{EBO} | $V_{EB} = 4.0Vdc, I_C = 0$ | — | 50 | nA |
| Collector Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C = 1.0\ mAdc, I_B = 0$ | 160 | — | Vdc |
| Collector Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C = 100\ \mu\ Adc, I_E = 0$ | 180 | — | Vdc |
| Emitter Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E = 10\ \mu\ Adc, I_C = 0$ | 6.0 | — | Vdc |
| DC current gain 直流电流增益 | h_{FE} | $I_C = 1.0\ mAdc, V_{CE} = 5.0Vdc$ | 80 | — | — |
| | | $I_C = 10\ mAdc, V_{CE} = 5.0Vdc$ | 80 | 360 | — |
| | | $I_C = 50\ mAdc, V_{CE} = 5.0Vdc$ | 30 | — | — |
| collector-emitter saturation voltage 集电极-发射极饱和压降 | V_{CEsat} | $I_C = 10\ mAdc, I_B = 1.0\ mAdc$ | — | 0.15 | Vdc |
| | | $I_C = 50\ mAdc, I_B = 5.0\ mAdc$ | — | 0.2 | Vdc |
| Base Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | $I_C = 10\ mAdc, I_B = 1.0\ mAdc$ | — | 1.0 | Vdc |
| | | $I_C = 50\ mAdc, I_B = 5.0\ mAdc$ | — | 1.0 | Vdc |



High Voltage Transistors 高压三极管

NPN Silicon (FHTA42)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 300 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 300 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 6.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 500 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|---------------------|--------------------|---------|
| Total Device Dissipation 总耗散功率 FR-5Board(1) ($T_A=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_A=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | $T_J,$ T_{stg} | 150 -55 to +150 | |

DEVICE MARKING 打标

FHTA42=1D

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|--|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=200Vdc, I_E=0$ | — | — | 100 | nAdc |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=6.0Vdc, I_C=0$ | — | — | 100 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0\text{ mAdc}, I_B=0$ | 300 | — | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\ \mu\text{ Adc}, I_E=0$ | 300 | — | — | Vdc |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\ \mu\text{ Adc}, I_C=0$ | 6.0 | — | — | Vdc |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $I_C=1.0\text{ mAdc}, V_{CE}=10Vdc$ | 25 | — | — | — |
| | $h_{FE}(2)$ | $I_C=10\text{ mAdc}, V_{CE}=10Vdc$ | 40 | — | — | — |
| | $h_{FE}(3)$ | $I_C=30\text{ mAdc}, V_{CE}=10Vdc$ | 40 | — | — | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=20\text{ mAdc}, I_B=2.0\text{ mAdc}$ | — | — | 0.5 | Vdc |
| Base-Emitter On Voltage 基极-发射极导通电压 | $V_{BE(sat)}$ | $I_C=20\text{ mAdc}, I_B=2.0\text{ mAdc}$ | — | — | 0.9 | Vdc |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C=10\text{ mAdc}, V_{CE}=20Vdc$ $f=100\text{ MHz}$ | 50 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB}=20.0Vdc, I_E=0,$ $f=1.0\text{ MHz}$ | — | — | 3.0 | pF |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μ s; Duty Cycle 2.0%.



High Voltage Transistors 高压三极管

NPN Silicon (FHTA44)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 400 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 400 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 100 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|---------------------|--------------------|---------|
| Total Device Dissipation 总耗散功率 FR-5 Board(1) ($T_A=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_A=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | $T_J,$ T_{stg} | 150 -55 to +150 | |

DEVICE MARKING 打标

FHTA44=1Z

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|---|---------------|--|---------|----------|---------|---------|
| Collector-Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=200Vdc, I_E=0$ | — | — | 100 | nAdc |
| Emitter-Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=5.0Vdc, I_C=0$ | — | — | 100 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0\text{ mAdc}, I_B=0$ | 400 | — | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\ \mu\text{ Adc}, I_E=0$ | 400 | — | — | Vdc |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\ \mu\text{ Adc}, I_C=0$ | 5.0 | — | — | Vdc |
| DC Current Gain 直流电流增益 | h_{FE} | $I_C=10\text{mAdc}, V_{CE}=10Vdc$ | 70 | — | 200 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=100\text{mAdc}, I_B=10\text{mAdc}$ | — | — | 0.5 | Vdc |
| Base-Emitter On Voltage 基极-发射极导通电压 | $V_{BE(sat)}$ | $I_C=20\text{mAdc}, I_B=2.0\text{mAdc}$ | — | — | 0.9 | Vdc |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C=10\text{mAdc}, V_{CE}=20Vdc$ $f=100\text{MHz}$ | 50 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB}=20.0Vdc, I_E=0, f=1.0\text{MHz}$ | — | — | 6.0 | pF |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μ s; Duty Cycle 2.0%.



High Voltage Transistors 高压三极管

PNP Silicon (FHTA92)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -300 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -300 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -500 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|---------------------|--------------------|---------|
| Total Device Dissipation 总耗散功率 FR-5Board(1) ($T_A=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_A=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | $T_J,$ T_{stg} | 150 -55 to +150 | |

DEVICE MARKING 打标

FHTA92=2D

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|---|---------------|--|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB} = -200Vdc, I_E = 0$ | — | — | -250 | nAdc |
| Emitter-Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB} = -3.0Vdc, I_C = 0$ | — | — | -100 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C = -1.0 mAdc, I_B = 0$ | -300 | — | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C = -100 \mu Adc, I_E = 0$ | -300 | — | — | Vdc |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E = -100 \mu Adc, I_C = 0$ | -5.0 | — | — | Vdc |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $I_C = -10mAdc, V_{CE} = -10Vdc$ | 40 | — | — | — |
| | $h_{FE}(2)$ | $I_C = -30mAdc, V_{CE} = -10Vdc$ | 25 | — | — | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C = -20mAdc, I_B = -2.0mAdc$ | — | — | -0.5 | Vdc |
| Base-Emitter On Voltage 基极-发射极导通电压 | $V_{BE(sat)}$ | $I_C = -20mAdc, I_B = -2.0mAdc$ | — | — | -0.9 | Vdc |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C = -10mAdc, V_{CE} = -20Vdc$ $f = 100MHz$ | 50 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB} = -20.0Vdc, I_E = 0,$ $f = 1.0MHz$ | — | — | 6.0 | pF |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μ s; Duty Cycle 2.0%.



General Purpose Transistors 三极管 NPN Silicon (FHTA94)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -450 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -450 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -100 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|----------------------|--------------------|---------|
| Total Device Dissipation 总耗散功率 FR-5 Board(1) ($T_A=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_A=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | T_J , T_{stg} | 150 -55 to +150 | |

DEVICE MARKING 打标

| |
|-----------|
| FHTA94=2Z |
|-----------|

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|--|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB} = -200Vdc, I_E = 0$ | — | — | -250 | nAdc |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB} = -3.0Vdc, I_C = 0$ | — | — | -100 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C = -1.0 mAdc, I_B = 0$ | -450 | — | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C = -100 \mu Adc, I_E = 0$ | -450 | — | — | Vdc |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E = -100 \mu Adc, I_C = 0$ | -5.0 | — | — | Vdc |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $I_C = -10mAdc, V_{CE} = -10Vdc$ | 60 | — | 300 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C = -20mAdc, I_B = -2.0mAdc$ | — | — | -0.6 | Vdc |
| Base-Emitter On Voltage 基极-发射极导通电压 | $V_{BE(sat)}$ | $I_C = -20mAdc, I_B = -2.0mAdc$ | — | — | -0.9 | Vdc |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C = -10mAdc, V_{CE} = -20Vdc$ $f = 100MHz$ | 50 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB} = -20.0Vdc, I_E = 0,$ $f = 1.0MHz$ | — | — | 6.0 | pF |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μ s; Duty Cycle 2.0%.



High Voltage Transistors 高压三极管

NPN Silicon (FHBF822)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|-------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 250 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 250 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | mAdc |
| Collector Current 集电极电流 | I_C | 50 | mAdc |
| peak collector current 集电极峰值电流 | I_{CM} | 100 | mA |
| peak base current 基极峰值电流 | I_{BM} | 50 | mA |

THERMAL CHARACTERISTICS 热特性

| CHARACTERISTIC 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|---------------|----------|---------|
| total power dissipation 总耗散功率 ($T_{amb} \leq 25$ C; note 1) | P_{tot} | 250 | mW |
| storage temperature 储存温度 | T_{stg} | -65 +150 | |
| junction temperature 结温 | T_j | 150 | |
| operating ambient temperature 工作环境温度 | T_{amb} | -65 +150 | |
| Thermal resistance from junction to ambient 热阻 (note 1) | $R_{th\ j-a}$ | 500 | K/W |

1. Transistor mounted on an FR4 printed-circuit board.

DEVICE MARKING 打标

FHBF822=1X

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Max 最大值 | Unit 单位 |
|---|-------------|--|---------|---------|---------|
| Collector cut-off current 集电极截止电流 | I_{CBO} | $I_E = 0; V_{CB} = 200$ V | - | 10 | nA |
| | | $I_E = 0; V_{CB} = 200$ V; $T_j = 150$ | - | 10 | μ A |
| Emitter cut-off current 发射极截止电流 | I_{EBO} | $I_C = 0; V_{EB} = 5$ V | - | 50 | nA |
| DC current gain 直流电流增益 | h_{FE} | $I_C = 25$ mA; $V_{CE} = 20$ V | 50 | - | - |
| Collector-Emitter saturation voltage 集电极-发射极饱和压降 | V_{CEsat} | $I_C = 30$ mA; $I_B = 5$ mA | - | 600 | mV |
| feedback capacitance 反馈电容 | C_{re} | $I_C = I_C = 0; V_{CB} = 30$ V; $f = 1$ MHz | - | 1.6 | pF |
| f_T transition frequency 特征频率 | f_T | $I_C = 10$ mA; $V_{CE} = 10$ V; $f = 100$ MHz | 60 | - | MHz |



General Purpose Transistors 三极管

NPN Silicon (FHT9011/FHT3879)

FEATURES 特点

HF,VHF BAND AMPLIFICATION

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 30 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 35 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 4.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 50 | mAdc |
| Emitter Current 发射极电流 | I_E | -50 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT9011R=RR(40 ~ 80), FHT9011O=RO(70 ~ 140), FHT9011Y=RY(120 ~ 240)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-----------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=35V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=4V, I_C=0$ | — | — | 1.0 | μA |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=12V, I_C=2mA$ | 40 | — | 240 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=10mA, I_B=1mA$ | — | — | 0.4 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $I_C=10mA, I_B=1mA$ | — | — | 1.0 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=10V, I_C=1mA$ | 100 | — | 400 | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0, f=1MHz$ | 1.4 | 2.0 | 3.2 | pF |



General Purpose Transistors 三极管

PNP Silicon (FHT9012)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(2)=25(\text{Min.})$ at $V_{CE}=-6V, I_C=-400\text{mA}$.

Complementary to FHT9013 与 FHT9013 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -30 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -40 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -500 | mAdc |
| Base Current 基极电流 | I_B | -50 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT9012O=5O(70 ~ 140), FHT9012Y=5Y(120 ~ 240), FHT9012G=5G(200 ~ 400)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|---------------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-35V, I_E=0$ | — | — | -0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=-5V, I_C=0$ | — | — | -0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0\text{mA}$ | -30 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-100\mu A$ | -40 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-100\mu A$ | -5 | — | — | V |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $V_{CE}=-1V, I_C=-100\text{mA}$ | 70 | — | 400 | — |
| | $h_{FE}(2)$ | $V_{CE}=-6V, I_C=-400\text{mA}$ | 25 | — | — | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-500\text{mA}, I_B=-50\text{mA}$ | — | — | -0.6 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=-1V, I_C=-100\text{mA}$ | — | -0.8 | -1.0 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-6V, I_C=-20\text{mA}$ | 150 | 200 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=-6V, I_E=0, f=1\text{MHz}$ | — | 13 | — | pF |



General Purpose Transistors 三极管

NPN Silicon (FHT9013)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(2)=25(\text{Min.})$ at $V_{CE}=6V, I_C=400\text{mA}$.

Complementary to FHT9012 与 FHT9012 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 30 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 40 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 500 | mAdc |
| Base Current 基极电流 | I_B | 50 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT9013O=6O(70 ~ 140), FHT9013Y=6Y(120 ~ 240), FHT9013G=6G(200 ~ 400)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-------------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=35V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=5V, I_C=0$ | — | — | 0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0\text{mA}$ | 30 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 40 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 5 | — | — | V |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $V_{CE}=1V, I_C=100\text{mA}$ | 70 | — | 400 | — |
| | $h_{FE}(2)$ | $V_{CE}=6V, I_C=400\text{mA}$ | 25 | — | — | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=500\text{mA}, I_B=50\text{mA}$ | — | — | 0.6 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=1V, I_C=100\text{mA}$ | — | 0.8 | 1.0 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=6V, I_C=20\text{mA}$ | 150 | 300 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=6V, I_E=0, f=1\text{MHz}$ | — | 7.0 | 10 | pF |



General Purpose Transistors 三极管

NPN Silicon (FH9014)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ)$

High 高 $h_{FE}:h_{FE}=70 \sim 700$

Low Noise 低噪声: $NF=1dB(Typ), 10dB(Max)$.

Complementary to FHT9015 与 FHT9015 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 45 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 50 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 150 | mAdc |
| Base Current 基极电流 | I_B | 30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT9014O=1O(70 ~ 140), FHT9014Y=1Y(120 ~ 240)
 FHT9014G=1G(200 ~ 400), FHT9014L=1L(350 ~ 700)

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-----------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=50V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=5V, I_C=0$ | — | — | 0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 45 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 50 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=6V, I_C=2mA$ | 70 | — | 700 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=100mA, I_B=5mA$ | — | — | 0.6 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=5.0V, I_C=10mA$ | — | — | 0.82 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=5.0V, I_C=10mA$ | 100 | 180 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0, f=1MHz$ | — | 4.0 | 7.0 | pF |



General Purpose Transistors 三极管

PNP Silicon (FHT9015)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ.)$

Low Noise 低噪声: $NF=1dB(Typ.), 10dB(Max.)$.

Complementary to FHT9014 与 FHT9014 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -50 | Vdc |
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -45 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -150 | mAdc |
| Base Current 基极电流 | I_B | -30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT9015O=3O(70 ~ 140), FHT9015Y=3Y(120 ~ 240),
FHT9015G=3G(200 ~ 400), FHT9015L=3L(350 ~ 700)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-----------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-50V, I_E=0$ | — | — | -0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=-5V, I_C=0$ | — | — | -0.1 | μA |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-100\mu A$ | -50 | — | — | V |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0mA$ | -45 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-100\mu A$ | -5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=-6V, I_C=-2mA$ | 70 | — | 400 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-100mA, I_B=-5mA$ | — | — | 0.6 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=-5.0V, I_C=-10mA$ | — | — | -0.82 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-5.0V, I_C=-10mA$ | 100 | 200 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=-10V, I_E=0,$ $f=1MHz$ | — | 4.0 | 7.0 | pF |



General Purpose Transistors 三极管

NPN Silicon (FHT9018)

FEATURES 特点

High Frequency Low Noise Amplifier

高频低噪声放大

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 19 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 30 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 50 | mAdc |
| Base Current 基极电流 | I_B | 50 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT9018R=8R(40 ~ 80), FHT9018O=8O(70 ~ 140),
FHT9018Y=8Y(100 ~ 200), FHT9018G=8G(160 ~ 300)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-----------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=20V, I_E=0$ | — | — | 0.5 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=3V, I_C=0$ | — | — | 0.5 | μA |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 30 | — | — | V |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 19 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 4 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=5V, I_C=1mA$ | 40 | — | 200 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=10mA, I_B=1mA$ | — | — | 0.6 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $I_B=10mA$ | — | — | 1.0 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=5V, I_C=10mA$ | 600 | 1100 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0, f=1MHz$ | — | 1.2 | 1.5 | pF |



General Purpose Transistors 三极管

NPN Silicon (FHT3880)

FEATURES 特点

High Frequency Low Noise Amplifier

高频低噪声放大

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 30 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 40 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 4.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 20 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT3880R=QR(40 ~ 80), FHT3880O=QO(70 ~ 140), FHT3880Y=QY(100 ~ 200)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|--------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=18V, I_E=0$ | — | — | 0.5 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=4V, I_C=0$ | — | — | 0.5 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 30 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 40 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 4.0 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=6V, I_C=1mA$ | 40 | — | 200 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=10mA, I_B=1mA$ | — | — | 0.6 | V |
| Reverse Transfer Capacitance 反馈电容 | C_{re} | $V_{CB}=6V, I_E=0, f=1MHz$ | — | 0.7 | — | pF |
| Transition Frequency 特征频率 | f_T | $V_{CE}=6V, I_C=1mA$ | — | 550 | — | MHz |
| Noise Figure 噪声系数 | NF | $V_{CE}=6V, I_C=1mA, f=100MHz$ | — | 2.5 | 5.0 | dB |



General Purpose Transistors 三极管

NPN Silicon (FHTH10)

FEATURES 特点

High Frequency Low Noise Amplifier

高频低噪声放大

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 25 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 30 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 3.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 50 | mAdc |
| Base Current 基极电流 | I_B | 50 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

FHTH10=3M

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-----------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=25V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=2V, I_C=0$ | — | — | 0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 25 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 30 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=10\mu A$ | 3 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=10V, I_C=4mA$ | 60 | — | — | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=4mA, I_B=0.4mA$ | — | — | 0.5 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=10V, I_C=4mA$ | — | — | 0.95 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=10V, I_C=4mA$ | 650 | 1100 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0, f=1MHz$ | — | — | 0.7 | pF |



General Purpose Transistors 三极管

NPN Silicon (FHT2223)

FEATURES 特点

High Frequency Low Noise Amplifier

高频低噪声放大

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 20 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 30 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 4.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 50 | mAdc |
| Base Current 基极电流 | I_B | 50 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT2223R=FT(40 ~ 80), FHT2223O=FO(60 ~ 120), FHT2223Y=FY(90 ~ 180)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|----------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=20V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=3V, I_C=0$ | — | — | 0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 20 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 30 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 4 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=6V, I_C=1mA$ | 40 | 90 | 180 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=10mA, I_B=1mA$ | — | 0.1 | 0.3 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=6V, I_C=1mA$ | — | 0.72 | — | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=6V, I_E=-1mA$ | 400 | 600 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=6V, I_E=0, f=1MHz$ | — | 1.0 | — | pF |



General Purpose Transistors 三极管

PNP Silicon (FHT5087)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ)$

Low Noise 低噪声

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -50 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -50 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -3.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -50 | mAdc |
| Base Current 基极电流 | I_B | -30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

FHT5087=2Q

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|---|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-10V, I_E=0$ | — | — | -10 | nA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0mA$ | -50 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-100\mu A$ | -50 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-100\mu A$ | -3 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=-5V, I_C=-100\mu A$ | 250 | — | 800 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-10mA, I_B=-1.0mA$ | — | — | -0.3 | V |
| Base-Emitter Voltage 基极-发射极电压 | $V_{BE(sat)}$ | $I_C=-10mA, I_B=-1.0mA$ | — | — | -0.85 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-5.0V, I_C=-500\mu A$ | 40 | 200 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=-5V, I_E=0, f=1MHz$ | — | 2.0 | 4.0 | pF |
| Noise Figure 噪声系数 | NF | $R_S=3.0kV_{CE}=-5.0Vdc, I_C=-100\mu A, f=1.0KHz$ | — | 1.0 | 2.0 | dB |



General Purpose Transistors 三极管

NPN Silicon (FHT5088)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ.)$

Low Noise 低噪声.

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 30 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 35 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 4.5 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 50 | mAdc |
| Base Current 基极电流 | I_B | 30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

FHT5088=1Q

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|--|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=20V, I_E=0$ | — | — | 50 | nA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=3V, I_C=0$ | — | — | 50 | nA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 30 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 35 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 4.5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=5V, I_C=100\mu A$ | 300 | — | 900 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=10mA, I_B=1mA$ | — | — | 0.5 | V |
| Base-Emitter Voltage 基极-发射极电压 | $V_{BE(sat)}$ | $I_C=10mA, I_B=1mA$ | — | — | 0.8 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=5.0V, I_C=500\mu A$ | 50 | 180 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=5V, I_E=0, f=1MHz$ | — | 2.0 | 4.0 | pF |
| Noise Figure 噪声系数 | NF | $R_S=10k, V_{CE}=5.0Vdc$ $I_C=100\mu A, f=1.0KHz$ | — | 1.0 | 3.0 | dB |



General Purpose Transistors 三极管

NPN Silicon (FHT1623)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ.)$

High 高 $h_{FE}:h_{FE}=90 \sim 600$

Low Noise 低噪声: $NF=1dB(Typ.), 10dB(Max)$

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 50 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 60 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 100 | mAdc |
| Base Current 基极电流 | I_B | 30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT1623L4=L4(90 ~ 180), FHT1623L5=L5(135 ~ 270)
 FHT1623L6=L6(200 ~ 400), FHT1623L7=L7(300 ~ 600)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|----------------------------|---------|----------|---------|---------|
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=5V, I_C=0$ | — | — | 0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 50 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 60 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=6V, I_C=1mA$ | 90 | — | 600 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=100mA, I_B=10mA$ | — | 0.15 | 0.3 | V |
| Base-Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | $I_C=100mA, I_B=10mA$ | — | 0.86 | 1.0 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=6.0V, I_C=1mA$ | 0.55 | 0.62 | 0.65 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=6.0V, I_C=10mA$ | — | 250 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=6V, I_E=0, f=1MHz$ | — | 3.0 | — | pF |



General Purpose Transistors 三极管

NPN Silicon (FHT945)

FEATURES 特点

Excellent h_{FE} Linearity h_{FE} 线性特性极好

$h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ)$

High 高 $h_{FE}:h_{FE}=70 \sim 700$

Low Noise 低噪声: $NF=1dB(Typ.), 10dB(Max).$

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 50 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 60 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 150 | mAdc |
| Base Current 基极电流 | I_B | 30 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT9450=CO(70 ~ 140), FHT945Y=CY(120 ~ 240)
 FHT945G=CG(200 ~ 400), FHT945L=CL(350 ~ 700)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-----------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=60V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=5V, I_C=0$ | — | — | 0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 50 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 60 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 5 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=6V, I_C=2mA$ | 70 | — | 700 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=100mA, I_B=10mA$ | — | — | 0.25 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=5.0V, I_C=10mA$ | — | — | 0.82 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=5.0V, I_C=10mA$ | 100 | 180 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0, f=1MHz$ | — | 4.0 | 7.0 | pF |



General Purpose Transistors 三极管

NPN Silicon (FHT3356)

FEATURES 特点

High Frequency Low Noise Amplifier

高频低噪声放大

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 12 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 20 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 3.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 100 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT3356R23=R23(50 ~ 100), FHT3356R24=R24(80 ~ 160),
FHT3356R25=R25(125 ~ 250)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|---|---------------|---------------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=10V, I_E=0$ | — | — | 1.0 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=1V, I_C=0$ | — | — | 1.0 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 12 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=10\mu A$ | 20 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=10\mu A$ | 3.0 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=10V, I_C=20mA$ | 50 | 120 | 300 | — |
| Transition Frequency 特征频率 | f_T | $V_{CE}=10V, I_C=20mA$ | — | 7 | — | GHz |
| Feed-Back Capacitance 反馈电容 | C_{re} | $V_{CB}=10V, I_E=0,$ $f=1MHz$ | — | 0.55 | 1.0 | pF |
| Insertion Power Gain 插入功率增益 | $ S_{21e} ^2$ | $V_{CE}=10V, I_C=20mA,$ $f=1.0GHz$ | — | 11.5 | — | dB |
| Noise Factor 噪声系数 | NF | $V_{CE}=10V, I_C=7mA,$ $f=1.0GHz$ | — | 1.1 | 2.0 | dB |



General Purpose Transistors 三极管

NPN Silicon (FHT3837)

FEATURES 特点

High Frequency Low Noise Amplifier
高频低噪声放大

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 18 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 30 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 3.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 50 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT3837N=CN(56 ~ 120), FHT3837P=CP(80 ~ 180), FHT3837Q=CQ(120 ~ 270),
FHT3837R=CR(180 ~ 390)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------------|---|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=10V, I_E=0$ | — | — | 0.5 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=2V, I_C=0$ | — | — | 0.5 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 18 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=10\mu A$ | 30 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=10\mu A$ | 3 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=10V, I_C=10mA$ | 56 | — | 390 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=20mA, I_B=4mA$ | — | — | 0.5 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=10V, I_E=10mA, f=200MHz$ | 600 | 1500 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0, f=1MHz$ | — | 0.9 | 1.5 | pF |
| Collector-Base Time Constant 集电极-基极时间常数 | $r_{bb'} \cdot C_C$ | $V_{CB}=10V, I_C=10mA, f=31.8MHz$ | | 6 | 13 | ps |
| Noise Factor 噪声系数 | NF | $V_{CE}=12V, I_C=2mA, f=200MHz, R_g=50$ | | 4.5 | | dB |



General Purpose Transistors 三极管

NPN Silicon (FHT3838)

FEATURES 特点

High Frequency Low Noise Amplifier
高频低噪声放大

MAXIMUM RATINGS($T_a=25$) 最大额定值

| CHARACTERISTIC 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 11 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 20 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 3.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 50 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT3838N=AN(56 ~ 120), FHT3838P=AP(80 ~ 180), FHT3838Q=AQ(120 ~ 270),
FHT3838R=AR(180 ~ 390)

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------------|--|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=10V, I_E=0$ | — | — | 0.5 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=2V, I_C=0$ | — | — | 0.5 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0mA$ | 11 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=10\mu A$ | 20 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=10\mu A$ | 3 | — | — | V |
| DC Current Gain 直流电流增益 | h_{FE} | $V_{CE}=10V, I_C=5mA$ | 56 | — | 390 | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=10mA, I_B=5mA$ | — | — | 0.5 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=10V, I_E=10mA, f=500MHz$ | 1.4 | 3.2 | — | GHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0, f=1MHz$ | — | 0.8 | 1.5 | pF |
| Collector-Base Time Constant 集电极-基极时间常数 | $r_{bb'} \cdot C_C$ | $V_{CB}=10V, I_C=10mA, f=31.8MHz$ | | 4 | 12 | ps |
| Noise Factor 噪声系数 | NF | $V_{CE}=6V, I_C=2mA, f=500MHz, R_g=50$ | | 3.5 | | dB |



General Purpose Transistors 三极管

Darlington Transistors

NPN Silicon (FHTA14)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|--------------------------------------|-----------|------------|---------|
| Collector Emitter Voltage 集电极发射极电压 | V_{CEO} | 30 | Vdc |
| Collector Base Voltage 集电极基极电压 | V_{CBO} | 30 | Vdc |
| Emitter Base Voltage 发射极基极电压 | V_{EBO} | 10 | Vdc |
| Collector Current—Continuous 集电极电流连续 | I_C | 300 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | 55 ~ 150 | |

DEVICE MARKING 打标

FHTA14=1V

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|---|---------------|------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=30V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=10V, I_C=0$ | — | — | 0.1 | μA |
| Collector Emitter Breakdown Voltage 集电极发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=100\mu A$ | 30 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 30 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=1.00\mu A$ | 10 | — | — | V |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $V_{CE}=5V, I_C=10mA$ | 10,000 | — | — | — |
| | $h_{FE}(2)$ | $V_{CE}=5V, I_C=100mA$ | 20,000 | — | — | |
| Collector Emitter Saturation Voltage 集电极发射极饱和压降 | $V_{CE(sat)}$ | $I_C=100mA, I_B=0.1mA$ | — | — | 1.5 | V |
| Base Emitter Voltage 基极发射极电压 | V_{BE} | $V_{CE}=5V, I_C=100mA$ | — | — | 2.0 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=5V, I_C=10mA$ | 125 | 200 | — | MHz |



General Purpose Transistors 三极管

Darlington Transistors

PNP Silicon (FHTA64)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -30 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -30 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -10 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -500 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHTA64=2V

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|--------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-30V, I_E=0$ | — | — | -0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=-10V, I_C=0$ | — | — | -0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-100\mu A$ | -30 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-100\mu A$ | -30 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-1.0\mu A$ | -10 | — | — | V |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $V_{CE}=-5V, I_C=-10mA$ | 10,000 | — | — | — |
| | $h_{FE}(2)$ | $V_{CE}=-5V, I_C=-100mA$ | 20,000 | — | — | |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-100mA, I_B=-0.1mA$ | — | — | -1.5 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=-5V, I_C=-100mA$ | — | — | -2.0 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-5V, I_C=-10mA$ | 125 | 200 | — | MHz |



Low Frequency Power Amplifier Transistors

低频功率放大三极管 NPN Silicon (FHT8050)

FEATURES 特点

Suitable for Driver Stage of Small Motor 小马达驱动

Complementary to FHT8550 与 FHT8550 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 25 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 40 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 800 | mAdc |
| Base Current 基极电流 | I_B | 160 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT8050O=7O(85 ~ 200), FHT8050Y=7Y(160 ~ 300), **FHT8050G=7G(280 ~ 360)**

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-----------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=30V, I_E=0$ | — | — | 0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=5V, I_C=0$ | — | — | 0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=10mA$ | 25 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\mu A$ | 40 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu A$ | 5 | — | — | V |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $V_{CE}=1V, I_C=100mA$ | 85 | — | 360 | — |
| | $h_{FE}(2)$ | $V_{CE}=1V, I_C=800mA$ | 40 | — | — | — |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=500mA, I_B=50mA$ | — | — | 0.6 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=1V, I_C=10mA$ | — | 0.8 | 1.0 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=5V, I_C=10mA$ | 100 | 120 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=10V, I_E=0, f=1MHz$ | — | 13 | 30 | pF |



Low Frequency Power Amplifier Transistors

低频功率放大三极管

PNP Silicon (FHT8550)

FEATURES 特点

Suitable for Driver Stage of Small Motor 小马达驱动

Complementary to FHT8050 与 FHT8050 互补

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|---------------------------------------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -25 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -40 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5.0 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -800 | mAdc |
| Base Current 基极电流 | I_B | -160 | mAdc |
| Collector Power Dissipation 集电极耗散功率 | P_C | 300 | mW |
| Junction Temperature 结温 | T_j | 150 | |
| Storage Temperature Range 储存温度 | T_{stg} | -55 ~ 150 | |

DEVICE MARKING 打标

$h_{FE}(1)$ FHT8550O=9O(85 ~ 200), FHT8550Y=9Y(160 ~ 300), **FHT8550G=9G(280 ~ 360)**

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|-----------------------------------|---------|----------|------------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | $V_{CB}=-30V, I_E=0$ | — | — | -0.1 | μA |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | $V_{EB}=-5V, I_C=0$ | — | — | -0.1 | μA |
| Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-10mA$ | -25 | — | — | V |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-100\mu A$ | -40 | — | — | V |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-100\mu A$ | -5 | — | — | V |
| DC Current Gain 直流电流增益 | $h_{FE}(1)$ | $V_{CE}=-1V, I_C=-100mA$ | 85 | — | 360 | — |
| | $h_{FE}(2)$ | $V_{CE}=-1V, I_C=-800mA$ | 40 | — | — | |
| Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-500mA, I_B=-50mA$ | — | — | -0.6 | V |
| Base-Emitter Voltage 基极-发射极电压 | V_{BE} | $V_{CE}=-1V, I_C=-10mA$ | — | -0.8 | -1.0 | V |
| Transition Frequency 特征频率 | f_T | $V_{CE}=-5V, I_C=-10mA$ | 100 | 120 | — | MHz |
| Collector Output Capacitance 输出电容 | C_{ob} | $V_{CB}=-10V, I_E=0,$ $f=1MHz$ | — | 13 | 30 | pF |



General Purpose Transistors 三极管

NPN Silicon (FHS2222/A)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | | Rating 额定值 | Unit 单位 |
|--|-----------|----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | FHS2222 | 30 | Vdc |
| | | FHS2222A | 40 | |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | FHS2222 | 60 | Vdc |
| | | FHS2222A | 75 | |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | FHS2222 | 5 | Vdc |
| | | FHS2222A | 6 | |
| Collector Current—Continuous 集电极电流-连续 | I_C | | 600 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|-----------|-------------|---------|
| Total Device Dissipation 总耗散功率 FR-5 Board(1) ($T_A=25$ 环境温度 25) Derate above 25 超过 25 递减 | P_D | 225 | mW |
| | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_A=25$ Derate above 25 超过 25 递减 | P_D | 300 | mW |
| | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | T_J | 150 | |
| | T_{stg} | -55 to +150 | |

DEVICE MARKING 打标

FHS2222=1B,FHS2222A=1P

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 | |
|-------------------------------------|-----------|---------------------|---|----------|---------|---------|-----------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | FHS2222 | $V_{CB}=50Vdc$ | — | — | 0.01 | μAdc |
| | | FHS2222A | $V_{CB}=60Vdc$ | — | — | 0.01 | |
| | | FHS2222 | $V_{CB}=50Vdc$, $I_E=0, T_A=125$ | — | — | 10 | |
| | | FHS2222A | $V_{CB}=60Vdc$, $I_E=0, T_A=125$ | — | — | 10 | |
| Emitter Cutoff Current 发射极截止电流 | I_{EBO} | FHS2222A | $V_{EB}=3.0Vdc$, $I_C=0$ | — | — | 100 | nAdc |
| Collector Cutoff Current 集电极截止电流 | I_{CEX} | FHS2222A | $V_{CE}=60Vdc$, $I_{EB(off)}=3.0 Vdc$ | — | — | 10 | nAdc |



ELECTRICAL CHARACTERISTICS 电特性(Continued 续前页)

| | | | | | | | | |
|---|---------------|-----------|--|-----|---|-----|------|-----|
| Base Cutoff Current 基极截止电流 | I_{BEX} | FHS2222A | $V_{CE}=60Vdc,$ $V_{EB}=3.0Vdc$ | — | — | 20 | nAdc | |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | FHS2222 | $I_C=10\text{ mAdc},$ $I_B=0$ | 65 | — | — | Vdc | |
| | | FHS2222A | | 45 | | | | |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | FHS2222 | $I_C=10\ \mu\text{ Adc},$ $I_E=0$ | 80 | — | — | Vdc | |
| | | FHS2222A | | 50 | | | | |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | FHS2222 | $I_E=10\ \mu\text{ Adc},$ $I_C=0$ | 5 | — | — | Vdc | |
| | | FHS2222A | | 6 | | | | |
| DC Current Gain 直流电流增益 | h_{FE} | FHS2222/A | $I_C=0.1\text{mAdc},$ $V_{CE}=10Vdc$ | 35 | — | — | — | |
| | | FHS2222/A | $I_C=1\text{mAdc},$ $V_{CE}=10Vdc$ | 50 | | | | |
| | | FHS2222/A | $I_C=10\text{mAdc},$ $V_{CE}=10Vdc$ | 75 | | | | |
| | | FHS2222A | $I_C=10\text{mAdc},$ $V_{CE}=10Vdc$ $T_A=-55$ | 35 | | | | |
| | | FHS2222/A | $I_C=150\text{mAdc},$ $V_{CE}=10Vdc$ | 100 | | | | 300 |
| | | FHS2222/A | $I_C=150\text{mAdc},$ $V_{CE}=10Vdc$ | 50 | | | | — |
| | | FHS2222 | $I_C=500\text{mAdc},$ $V_{CE}=10Vdc$ | 30 | | | | — |
| | | FHS2222A | $V_{CE}=10Vdc$ | 40 | | | | — |
| Collector-Emitter Saturation Voltage(3) 集电极-发射极饱和压降 | $V_{CE(sat)}$ | FHS2222 | $I_C=150\text{mAdc},$ $I_B=15\text{mAdc}$ | — | — | — | Vdc | |
| | | FHS2222A | | 0.4 | | | | |
| | | FHS2222 | $I_C=500\text{mAdc},$ $I_B=50\text{mAdc}$ | — | | | | 0.3 |
| | | FHS2222A | | 1.6 | | | | |
| Base-Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | FHS2222 | $I_C=150\text{mAdc},$ $I_B=15\text{mAdc}$ | — | — | — | Vdc | |
| | | FHS2222A | | 1.3 | | | | |
| | | FHS2222 | $I_C=500\text{mAdc},$ $I_B=50\text{mAdc}$ | 0.6 | | | | 1.2 |
| | | FHS2222A | | 2.6 | | | | |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | FHS2222 | $I_C=10\text{mAdc},$ $V_{CE}=20Vdc,$ $f=100\text{MHz}$ | 250 | — | — | MHz | |
| | | FHS2222A | | 300 | | | | |
| Output Capacitance 输出电容 | C_{obo} | FHS2222/A | $V_{CB}=10Vdc,$ $I_E=0, f=1.0\text{MHz}$ | — | — | 8.0 | pF | |
| Input Capacitance 输入电容 | C_{ibo} | FHS2222 | $V_{EB}=0.5Vdc,$ $I_C=0,$ $f=1.0\text{MHz}$ | — | — | 30 | pF | |
| | | FHS2222A | | — | — | 25 | | |

SWITCHING CHARACTERISTICS 开关特性

| | | | | | | |
|-------------------|-------|---|---|---|-----|----|
| Delay Time 延迟时间 | t_d | $V_{CC}=30Vdc, V_{BE}=-0.5Vdc,$ $I_C=150\text{mAdc}, I_{B1}=15\text{mAdc}$ | — | — | 10 | nS |
| Rise Time 上升时间 | t_r | | — | — | 25 | |
| Storage Time 储存时间 | t_s | $V_{CC}=30Vdc, I_C=150\text{mAdc},$ $I_{B1}=I_{B2}=15\text{mAdc}$ | — | — | 225 | nS |
| Fall Time 下降时间 | t_f | | — | — | 60 | |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μs; Duty Cycle 2.0%.



General Purpose Transistors 三极管

PNP Silicon (FHS2907/A)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | | Rating 额定值 | Unit 单位 |
|--|-----------|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | FHS2907 | -40 | Vdc |
| | | FHS2907A | -60 | |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | FHS2907/A | -60 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | FHS2907/A | -5 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | | -600 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|-----------|-------------|---------|
| Total Device Dissipation 总耗散功率 FR-5 Board(1) ($T_a=25$ 环境温度 25) Derate above 25 超过 25 递减 | P_D | 225 | mW |
| | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_a=25$ Derate above 25 超过 25 递减 | P_D | 300 | mW |
| | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | T_J | 150 | |
| | T_{stg} | -55 to +150 | |

DEVICE MARKING 打标

FHS2907=2B,FHS2907A=2F

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|---|---------------|---------------------|--|----------|---------|-----------|
| Collector Cutoff Current 集电极截止电流 | I_{CBO} | FHS2907 | $V_{CB} = -50Vdc$ | — | -0.02 | μAdc |
| | | FHS2907A | | — | -0.01 | |
| | | FHS2907 | $V_{CB} = -50Vdc,$ $I_E = 0, T_a = 125$ | — | -20 | |
| | | FHS2907A | | — | -10 | |
| Collector Cutoff Current 集电极截止电流 | I_{CEX} | FHS2907A | $V_{CE} = -30Vdc,$ $I_{EB} = -0.5Vdc$ | — | -50 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | FHS2907 | $I_C = -10 mAdc,$ $I_B = 0$ | -40 | — | Vdc |
| | | FHS2907A | | -60 | | |



ELECTRICAL CHARACTERISTICS 电特性(Continued 续前页)

| | | | | | | | |
|---|---------------|-----------|---|------|---|------|-----|
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | FHS2907 | $I_C=-10\mu\text{A}$, $I_E=0$ | -60 | — | — | Vdc |
| | | FHS2907A | | | | | |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | FHS2907 | $I_E=-10\mu\text{A}$, $I_C=0$ | -5.0 | — | — | Vdc |
| | | FHS2907A | | | | | |
| DC Current Gain 直流电流增益 | h_{FE} | FHS2907 | $I_C=-0.1\text{mA}$, $V_{CE}=-10\text{Vdc}$ | 35 | — | — | — |
| | | FHS2907A | | 75 | — | — | |
| | | FHS2907 | $I_C=-1\text{mA}$, $V_{CE}=-10\text{Vdc}$ | 50 | — | — | |
| | | FHS2907A | | 100 | — | — | |
| | | FHS2907 | $I_C=-10\text{mA}$, $V_{CE}=-10\text{Vdc}$ | 75 | — | — | |
| | | FHS2907A | | 100 | — | — | |
| | | FHS2907 | $I_C=-150\text{mA}$, $V_{CE}=-10\text{Vdc}$ | 100 | — | 300 | |
| | | FHS2907A | | 100 | — | 300 | |
| | | FHS2907 | $I_C=-500\text{mA}$, $V_{CE}=-10\text{Vdc}$ | 30 | — | — | |
| | | FHS2907A | | 50 | — | — | |
| Collector-Emitter Saturation Voltage(3) 集电极-发射极饱和压降 | $V_{CE(sat)}$ | FHS2907/A | $I_C=-150\text{mA}$, $I_B=-15\text{mA}$ | — | — | -0.4 | Vdc |
| | | | $I_C=-500\text{mA}$, $I_B=-50\text{mA}$ | — | — | -1.6 | |
| Base-Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | FHS2907/A | $I_C=-150\text{mA}$, $I_B=-15\text{mA}$ | — | — | -1.3 | Vdc |
| | | | $I_C=-500\text{mA}$, $I_B=-50\text{mA}$ | — | — | -2.6 | |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | FHS2907/A | $I_C=-50\text{mA}$, $V_{CE}=-20\text{Vdc}$, $f=100\text{MHz}$ | 200 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | FHS2907/A | $V_{CB}=-10\text{Vdc}$, $I_E=0, f=1.0\text{MHz}$ | — | — | 8.0 | pF |
| Input Capacitance 输入电容 | C_{ibo} | FHS2907/A | $V_{EB}=-2.0\text{Vdc}$, $I_C=0$, $f=1.0\text{MHz}$ | — | — | 30 | pF |

SWITCHING CHARACTERISTICS 开关特性

| | | | | | | |
|--------------------|-----------|---|---|---|-----|----|
| Turn-On Time 开启时间 | t_{on} | $V_{CC}=-30\text{Vdc}$, $I_C=-150\text{mA}$, $I_{B1}=-15\text{mA}$ | — | — | 45 | nS |
| Delay Time 延迟时间 | t_d | | — | — | 10 | |
| Rise Time 上升时间 | t_r | | — | — | 40 | |
| Storage Time 储存时间 | t_s | $V_{CC}=-6.0\text{Vdc}$, $I_C=-150\text{mA}$, $I_{B1}=I_{B2}=-15\text{mA}$ | — | — | 80 | nS |
| Fall Time 下降时间 | t_f | | — | — | 30 | |
| Turn-Off Time 关断时间 | t_{off} | | — | — | 100 | |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μs; Duty Cycle 2.0%.



General Purpose Transistors 三极管

NPN Silicon (FHS3904)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|--|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 40 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 60 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 5 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 200 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|--------------------|--------------------|---------|
| Total Device Dissipation 总耗散功率 FR-5 Board(1) ($T_a=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_a=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | T_J T_{stg} | 150 -55 to +150 | |

DEVICE MARKING 打标

FHS3904=1AM

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|---------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CEX} | $V_{CE}=30Vdc, V_{EB}=3.0Vdc$ | — | — | 50 | nAdc |
| Base Cutoff Current 基极截止电流 | I_{BEX} | $V_{CE}=30Vdc, V_{EB}=3.0Vdc$ | — | — | 50 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0\text{ mAdc}, I_B=0$ | 40 | — | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=10\ \mu\text{ Adc}, I_E=0$ | 60 | — | — | Vdc |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=10\ \mu\text{ Adc}, I_C=0$ | 5 | — | — | Vdc |



ELECTRICAL CHARACTERISTICS 电特性(Continued 续前页)

| | | | | | | |
|--|---------------|--|------|---|------|------------------|
| DC Current Gain 直流电流增益 | h_{FE} | $I_C=0.1mA_{dc}, V_{CE}=1.0V_{dc}$ | 40 | — | — | — |
| | | $I_C=1.0mA_{dc}, V_{CE}=1.0V_{dc}$ | 70 | — | — | |
| | | $I_C=10mA_{dc}, V_{CE}=1.0V_{dc}$ | 100 | — | 300 | |
| | | $I_C=50mA_{dc}, V_{CE}=1.0V_{dc}$ | 60 | — | — | |
| | | $I_C=100mA_{dc}, V_{CE}=1.0V_{dc}$ | 30 | — | — | |
| Collector-Emitter Saturation Voltage(3) 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=10mA_{dc}, I_B=1.0mA_{dc}$ | — | — | 0.2 | Vdc |
| | | $I_C=50mA_{dc}, I_B=5.0mA_{dc}$ | — | — | 0.3 | |
| Base-Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | $I_C=10mA_{dc}, I_B=1.0mA_{dc}$ | 0.65 | — | 0.85 | Vdc |
| | | $I_C=50mA_{dc}, I_B=5.0mA_{dc}$ | — | — | 0.95 | |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C=10mA_{dc}, V_{CE}=20V_{dc}, f=100MHz$ | 300 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB}=5.0V_{dc}, I_E=0, f=1.0MHz$ | — | — | 4.0 | pF |
| Input Capacitance 输入电容 | C_{ibo} | $V_{EB}=0.5V_{dc}, I_C=0, f=1.0MHz$ | — | — | 8.0 | pF |
| Input Impedance 输入阻抗 | h_{ie} | $V_{CE}=10V_{dc}, I_C=1.0mA_{dc}, f=1.0KHz$ | 1.0 | — | 10 | k |
| Voltage Feedback Ratio 电压反馈系数 | h_{re} | $V_{CE}=10V_{dc}, I_C=1.0mA_{dc}, f=1.0KHz$ | 0.5 | — | 8.0 | $\times 10^{-4}$ |
| Small-Signal Current Gain 小信号电流增益 | h_{fe} | $V_{CE}=10V_{dc}, I_C=1.0mA_{dc}, f=1.0KHz$ | 100 | — | 400 | |
| Output Admittance 输出导纳 | $*h_{oe}$ | $V_{CE}=10V_{dc}, I_C=1.0mA_{dc}, f=1.0KHz$ | 1.0 | — | 40 | $\mu mhos$ |
| Noise Figure 噪声系数 | NF | $V_{CE}=5.0V_{dc}, I_C=100 \mu A_{dc}, f=1.0KHz$ | — | — | 5.0 | dB |

SWITCHING CHARACTERISTICS 开关特性

| | | | | | | |
|----------------------|-------|---|---|---|-----|----|
| Delay Time 延迟时间 | t_d | $V_{CC}=3.0V_{dc}, V_{BE}=-0.5V_{dc}, I_C=10mA_{dc}, I_{B1}=1.0mA_{dc}$ | — | — | 35 | nS |
| Rise Time 上升时间 | t_r | | — | — | 35 | |
| Storage Time 储存时间 | t_s | $V_{CC}=3.0V_{dc}, I_C=10mA_{dc}, I_{B1}=I_{B2}=1.0mA_{dc}$ | — | — | 200 | nS |
| Fall Time 下降时间 | t_f | | — | — | 50 | |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μs ; Duty Cycle 2.0%.



General Purpose Transistors 三极管

PNP Silicon (FHS3906)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|--|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -40 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -40 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -200 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|--------------------|--------------------|---------|
| Total Device Dissipation 总耗散功率 FR-5 Board(1) ($T_A=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_A=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | T_J T_{stg} | 150 -55 to +150 | |

DEVICE MARKING 打标

FHS3906=2A

ELECTRICAL CHARACTERISTICS 电特性

($T_A=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|---------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CEX} | $V_{CE}=-30Vdc, V_{EB}=-3.0Vdc$ | — | — | -50 | nAdc |
| Base Cutoff Current 基极截止电流 | I_{BEX} | $V_{CE}=-30Vdc, V_{EB}=-3.0Vdc$ | — | — | -50 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0 mAdc, I_B=0$ | -40 | — | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-10 \mu Adc, I_E=0$ | -40 | — | — | Vdc |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-10 \mu Adc, I_C=0$ | -5 | — | — | Vdc |



ELECTRICAL CHARACTERISTICS 电特性(Continued 续前页)

| | | | | | | |
|--|---------------|---|-------|---|-------|------------------|
| DC Current Gain 直流电流增益 | h_{FE} | $I_C=-0.1mA, V_{CE}=-1.0Vdc$ | 60 | — | — | — |
| | | $I_C=-1.0mA, V_{CE}=-1.0Vdc$ | 80 | — | — | |
| | | $I_C=-10mA, V_{CE}=-1.0Vdc$ | 100 | — | 300 | |
| | | $I_C=-50mA, V_{CE}=-1.0Vdc$ | 60 | — | — | |
| | | $I_C=-100mA, V_{CE}=-1.0Vdc$ | 30 | — | — | |
| Collector-Emitter Saturation Voltage(3) 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-10mA, I_B=-1.0mA$ | — | — | -0.25 | Vdc |
| | | $I_C=-50mA, I_B=-5.0mA$ | — | — | -0.4 | |
| Base-Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | $I_C=-10mA, I_B=-1.0mA$ | -0.65 | — | -0.85 | Vdc |
| | | $I_C=-50mA, I_B=-5.0mA$ | — | — | -0.95 | |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C=-10mA, V_{CE}=-20Vdc, f=100MHz$ | 250 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB}=-5.0Vdc, I_E=0, f=1.0MHz$ | — | — | 4.5 | pF |
| Input Capacitance 输入电容 | C_{ibo} | $V_{EB}=-0.5Vdc, I_C=0, f=1.0MHz$ | — | — | 10 | pF |
| Input Impedance 输入阻抗 | h_{ie} | $V_{CE}=-10Vdc, I_C=-1.0mA, f=1.0KHz$ | 1.0 | — | 10 | k |
| Voltage Feedback Ratio 电压反馈系数 | h_{re} | $V_{CE}=-10Vdc, I_C=-1.0mA, f=1.0KHz$ | 0.5 | — | 8.0 | $\times 10^{-4}$ |
| Small-Signal Current Gain 小信号电流增益 | h_{fe} | $V_{CE}=-10Vdc, I_C=-1.0mA, f=1.0KHz$ | 100 | — | 400 | |
| Output Admittance 输出导纳 | $*h_{oe}$ | $V_{CE}=-10Vdc, I_C=-1.0mA, f=1.0KHz$ | 1.0 | — | 60 | $\mu mhos$ |
| Noise Figure 噪声系数 | NF | $V_{CE}=-5.0Vdc, I_C=-100\mu A, R_S=1.0K, f=1.0KHz$ | — | — | 4.0 | dB |

SWITCHING CHARACTERISTICS 开关特性

| | | | | | | |
|----------------------|-------|---|---|---|-----|----|
| Delay Time 延迟时间 | t_d | $V_{CC}=-3.0Vdc, V_{BE}=0.5Vdc, I_C=-10mA, I_{B1}=-1.0mA$ | — | — | 35 | nS |
| Rise Time 上升时间 | t_r | | — | — | 35 | |
| Storage Time 储存时间 | t_s | $V_{CC}=-3.0Vdc, I_C=-10mA, I_{B1}=I_{B2}=-1.0mA$ | — | — | 225 | nS |
| Fall Time 下降时间 | t_f | | — | — | 75 | |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μs ; Duty Cycle 2.0%.



General Purpose Transistors 三极管

NPN Silicon (FHS4401)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|--|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | 40 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | 60 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | 6 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | 600 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|----------------------|--------------------|---------|
| Total Device Dissipation 总耗散功率 FR-5 Board(1) ($T_a=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_a=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | T_J , T_{stg} | 150 -55 to +150 | |

DEVICE MARKING 打标

FHS4401=2X

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|----------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CEX} | $V_{CE}=35Vdc, V_{EB}=0.4Vdc$ | — | — | 100 | nAdc |
| Base Cutoff Current 基极截止电流 | I_{BEX} | $V_{CE}=35Vdc, V_{EB}=0.4Vdc$ | — | — | 100 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=1.0\text{ mAdc}, I_B=0$ | 40 | — | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=100\ \mu\text{ Adc}, I_E=0$ | 60 | — | — | Vdc |



ELECTRICAL CHARACTERISTICS 电特性(Continued 续前页)

| | | | | | | |
|--|---------------|---|------|---|------|------------------|
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=100\mu\text{A dc}, I_C=0$ | 6 | — | — | Vdc |
| DC Current Gain 直流电流增益 | h_{FE} | $I_C=0.1\text{mA dc}, V_{CE}=1.0\text{Vdc}$ | 20 | — | — | — |
| | | $I_C=1.0\text{mA dc}, V_{CE}=1.0\text{Vdc}$ | 40 | — | — | |
| | | $I_C=10\text{mA dc}, V_{CE}=1.0\text{Vdc}$ | 80 | — | — | |
| | | $I_C=150\text{mA dc}, V_{CE}=2.0\text{Vdc}$ | 100 | — | 300 | |
| | | $I_C=500\text{mA dc}, V_{CE}=2.0\text{Vdc}$ | 40 | — | — | |
| Collector-Emitter Saturation Voltage(3) 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=150\text{mA dc}, I_B=15\text{mA dc}$ | — | — | 0.4 | Vdc |
| | | $I_C=500\text{mA dc}, I_B=50\text{mA dc}$ | — | — | 0.75 | |
| Base-Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | $I_C=150\text{mA dc}, I_B=15\text{mA dc}$ | 0.75 | — | 0.95 | Vdc |
| | | $I_C=500\text{mA dc}, I_B=50\text{mA dc}$ | — | — | 1.2 | |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C=20\text{mA dc}, V_{CE}=10\text{Vdc}, f=100\text{MHz}$ | 250 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB}=5.0\text{Vdc}, I_E=0, f=1.0\text{MHz}$ | — | — | 6.5 | pF |
| Input Capacitance 输入电容 | C_{ibo} | $V_{EB}=0.5\text{Vdc}, I_C=0, f=1.0\text{MHz}$ | — | — | 30 | pF |
| Input Impedance 输入阻抗 | h_{ie} | $V_{CE}=10\text{Vdc}, I_C=1.0\text{mA dc}, f=1.0\text{KHz}$ | 1.0 | — | 15 | k |
| Voltage Feedback Ratio 电压反馈系数 | h_{re} | $V_{CE}=10\text{Vdc}, I_C=1.0\text{mA dc}, f=1.0\text{KHz}$ | 0.5 | — | 8.0 | $\times 10^{-4}$ |
| Small-Signal Current Gain 小信号电流增益 | h_{fe} | $V_{CE}=10\text{Vdc}, I_C=1.0\text{mA dc}, f=1.0\text{KHz}$ | 100 | — | 500 | — |
| Output Admittance 输出导纳 | h_{oe} | $V_{CE}=10\text{Vdc}, I_C=1.0\text{mA dc}, f=1.0\text{KHz}$ | 1.0 | — | 100 | μmhos |

SWITCHING CHARACTERISTICS 开关特性

| | | | | | | |
|----------------------|-------|---|---|---|-----|----|
| Delay Time 延迟时间 | t_d | $V_{CC}=30\text{Vdc}, V_{BE}=2.0\text{Vdc}, I_C=150\text{mA dc}, I_{B1}=15\text{mA dc}$ | — | — | 15 | nS |
| Rise Time 上升时间 | t_r | | — | — | 20 | |
| Storage Time 储存时间 | t_s | $V_{CC}=30\text{Vdc}, I_C=150\text{mA dc}, I_{B1}=I_{B2}=15\text{mA dc}$ | — | — | 225 | nS |
| Fall Time 下降时间 | t_f | | — | — | 30 | |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μs ; Duty Cycle 2.0%.



General Purpose Transistors 三极管

PNP Silicon (FHS4403)

MAXIMUM RATINGS($T_a=25$) 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rating 额定值 | Unit 单位 |
|--|-----------|------------|---------|
| Collector-Emitter Voltage 集电极-发射极电压 | V_{CEO} | -40 | Vdc |
| Collector-Base Voltage 集电极-基极电压 | V_{CBO} | -40 | Vdc |
| Emitter-Base Voltage 发射极-基极电压 | V_{EBO} | -5 | Vdc |
| Collector Current—Continuous 集电极电流-连续 | I_C | -600 | mAdc |

THERMAL CHARACTERISTICS 热特性

| Characteristic 特性参数 | Symbol 符号 | Max 最大值 | Unit 单位 |
|--|--------------------|--------------------|---------|
| Total Device Dissipation 总耗散功率 FR-5 Board(1) ($T_a=25$ 环境温度 25) | P_D | 225 | mW |
| Derate above 25 超过 25 递减 | | 1.8 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 556 | /W |
| Total Device Dissipation 总耗散功率 Alumina Substrate 氧化铝衬底,(2) $T_a=25$ | P_D | 300 | mW |
| Derate above 25 超过 25 递减 | | 2.4 | mW/ |
| Thermal Resistance Junction to Ambient 热阻 | R_{JA} | 417 | /W |
| Junction and Storage Temperature 结温和储存温度 | T_J T_{stg} | 150 -55 to +150 | |

DEVICE MARKING 打标

FHS4403=2T

ELECTRICAL CHARACTERISTICS 电特性

($T_a=25$ unless otherwise noted 如无特殊说明, 温度为 25)

| Characteristic 特性参数 | Symbol 符号 | Test Condition 测试条件 | Min 最小值 | Type 典型值 | Max 最大值 | Unit 单位 |
|--|---------------|---------------------------------------|---------|----------|---------|---------|
| Collector Cutoff Current 集电极截止电流 | I_{CEX} | $V_{CE}=-35Vdc$, $V_{EB}=-0.4Vdc$ | — | — | -100 | nAdc |
| Base Cutoff Current 基极截止电流 | I_{BEX} | $V_{CE}=-35Vdc$, $V_{EB}=-0.4Vdc$ | — | — | -100 | nAdc |
| Collector-Emitter Breakdown Voltage (3) 集电极-发射极击穿电压 | $V_{(BR)CEO}$ | $I_C=-1.0 mAdc$, $I_B=0$ | -40 | — | — | Vdc |
| Collector-Base Breakdown Voltage 集电极-基极击穿电压 | $V_{(BR)CBO}$ | $I_C=-100 \mu Adc$, $I_E=0$ | -40 | — | — | Vdc |
| Emitter-Base Breakdown Voltage 发射极-基极击穿电压 | $V_{(BR)EBO}$ | $I_E=-100 \mu Adc$, $I_C=0$ | -5 | — | — | Vdc |



ELECTRICAL CHARACTERISTICS 电特性(Continued 续前页)

| | | | | | | |
|--|---------------|---------------------------------------|-------|---|-------|------------------|
| DC Current Gain 直流电流增益 | h_{FE} | $I_C=-0.1mA, V_{CE}=-1.0Vdc$ | 30 | — | — | — |
| | | $I_C=-1.0mA, V_{CE}=-1.0Vdc$ | 30 | — | — | |
| | | $I_C=-10mA, V_{CE}=-1.0Vdc$ | 100 | — | — | |
| | | $I_C=-150mA, V_{CE}=-2.0Vdc$ | 100 | — | 300 | |
| | | $I_C=-500mA, V_{CE}=-2.0Vdc$ | 20 | — | — | |
| Collector-Emitter Saturation Voltage(3) 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_C=-150mA, I_B=-15mA$ | — | — | -0.4 | Vdc |
| | | $I_C=-500mA, I_B=-50mA$ | — | — | -0.75 | |
| Base-Emitter Saturation Voltage 基极-发射极饱和压降 | $V_{BE(sat)}$ | $I_C=-150mA, I_B=-15mA$ | -0.75 | — | -0.95 | Vdc |
| | | $I_C=-500mA, I_B=-50mA$ | — | — | -1.3 | |
| Current-Gain-Bandwidth Product 电流增益-带宽乘积 | f_T | $I_C=-20mA, V_{CE}=-10Vdc, f=100MHz$ | 200 | — | — | MHz |
| Output Capacitance 输出电容 | C_{obo} | $V_{CB}=-10Vdc, I_E=0, f=1.0MHz$ | — | — | 8.5 | pF |
| Input Capacitance 输入电容 | C_{ibo} | $V_{EB}=-0.5Vdc, I_C=0, f=1.0MHz$ | — | — | 30 | pF |
| Input Impedance 输入阻抗 | h_{ie} | $V_{CE}=-10Vdc, I_C=-1.0mA, f=1.0KHz$ | 1.0 | — | 15 | k |
| Voltage Feedback Ratio 电压反馈系数 | h_{re} | $V_{CE}=-10Vdc, I_C=-1.0mA, f=1.0KHz$ | 0.5 | — | 8.0 | $\times 10^{-4}$ |
| Small-Signal Current Gain 小信号电流增益 | h_{fe} | $V_{CE}=-10Vdc, I_C=-1.0mA, f=1.0KHz$ | 100 | — | 500 | |
| Output Admittance 输出导纳 | h_{oe} | $V_{CE}=-10Vdc, I_C=-1.0mA, f=1.0KHz$ | 1.0 | — | 100 | $\mu mhos$ |

SWITCHING CHARACTERISTICS 开关特性

| | | | | | | |
|-------------------|-------|---|---|---|-----|----|
| Delay Time 延迟时间 | t_d | $V_{CC}=-30Vdc, V_{BE}=-2.0Vdc, I_C=-150mA, I_{B1}=-15mA$ | — | — | 15 | nS |
| Rise Time 上升时间 | t_r | | — | — | 20 | |
| Storage Time 储存时间 | t_s | $V_{CC}=-30Vdc, I_C=-150mA, I_{B1}=I_{B2}=-15mA$ | — | — | 225 | nS |
| Fall Time 下降时间 | t_f | | — | — | 30 | |

- FR-5=1.0 × 0.75 × 0.062 in.
- Alumina=0.4 × 0.3 × 0.024 in. 99.5% alumina.
- Pulse Width 300 μs ; Duty Cycle 2.0%.

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