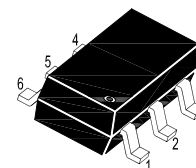
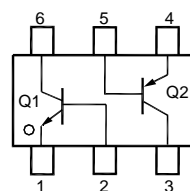


NPN / PNP Silicon Epitaxial Planar Transistors

■ Features

- Complementary Pair
- One 4401-Type NPN
One 4403-Type PNP
- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching



1. Emitter 2. Base 3. Collector
4. Emitter 5. Base 6. Collector

■ Simplified outline(SOT-363)

■ Maximum Ratings $T_a = 25^\circ\text{C}$ NPN 4401 Section

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	0.6	A
P_C	Collector Power Dissipation	0.2	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	625	$^\circ\text{C}/\text{W}$
T_J, T_{stg}	Operation Junction and Storage Temperature Range	-55 ~ +150	$^\circ\text{C}$

■ Electrical Characteristics $T_a = 25^\circ\text{C}$ NPN 4401 Section

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 100 \mu\text{A}, I_E = 0$	60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_B = 0$	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 100 \mu\text{A}, I_C = 0$	6		V
Collector cut-off current	I_{CBO}	$V_{CB} = 50\text{V}, I_E = 0$		0.1	μA
Collector cut-off current	I_{CEO}	$V_{CE} = 35\text{V}, I_B = 0$		0.5	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$		0.1	μA
DC current gain	$h_{FE(1)}$	$V_{CE} = 1\text{V}, I_C = 0.1\text{mA}$	20		
	$h_{FE(2)}$	$V_{CE} = 1\text{V}, I_C = 1\text{mA}$	40		
	$h_{FE(3)}$	$V_{CE} = 1\text{V}, I_C = 10\text{mA}$	80		
	$h_{FE(4)}$	$V_{CE} = 1\text{V}, I_C = 150\text{mA}$	100	300	
	$h_{FE(5)}$	$V_{CE} = 2\text{V}, I_C = 500\text{mA}$	40		
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$		0.4	V
	$V_{CE(sat)2}$	$I_C = 500\text{mA}, I_B = 50\text{mA}$		0.75	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	0.75	0.95	V
	$V_{BE(sat)2}$	$I_C = 500\text{mA}, I_B = 50\text{mA}$		1.2	V
Transition frequency	f_T	$V_{CE} = 10\text{V}, I_C = 20\text{mA}, f = 100\text{MHz}$	250		MHz
Output Capacitance	C_{ob}	$V_{CB} = 5\text{V}, I_E = 0, f = 1\text{MHz}$		6.5	pF
Delay time	t_d	$V_{CC} = 30\text{V},$ $V_{BE} = 2.0\text{V}, I_C = 150\text{mA}, I_{B1} = 15\text{mA}$		15	nS
Rise time	t_r			20	nS
Storage time	t_s	$V_{CC} = 30\text{V}, I_C = 150\text{mA}, I_{B1} = -I_{B2} = 15\text{mA}$		225	nS
Fall time	t_f			30	nS

■ Maximum Ratings Ta = 25°C PNP 4403 Section

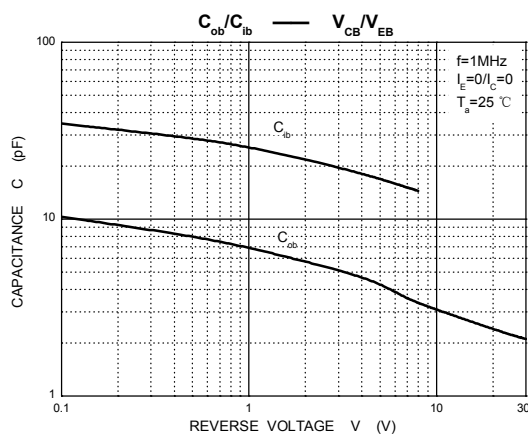
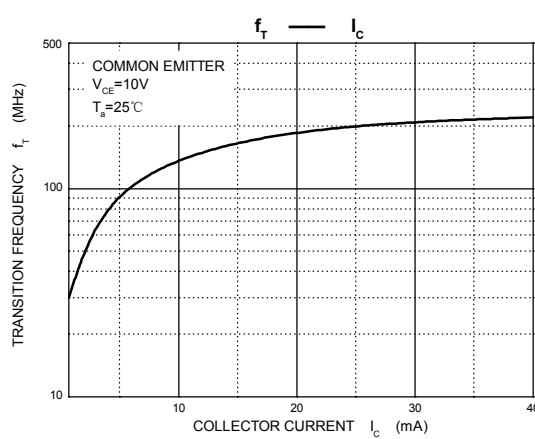
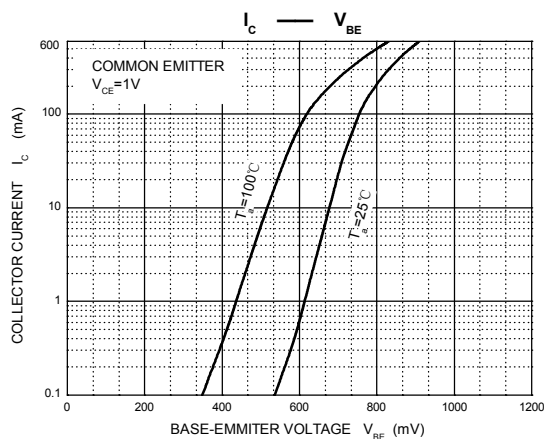
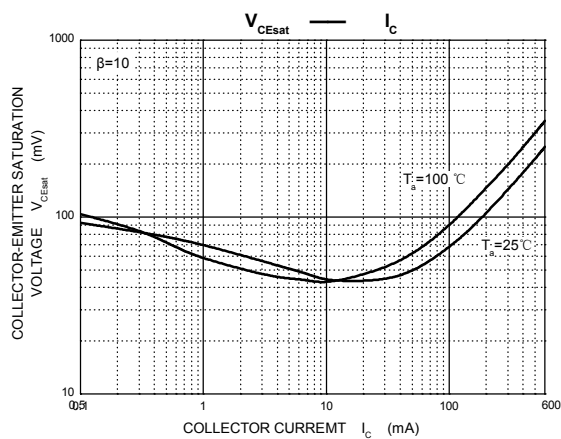
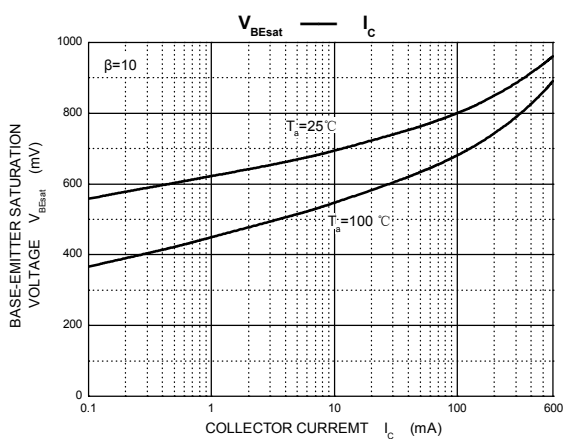
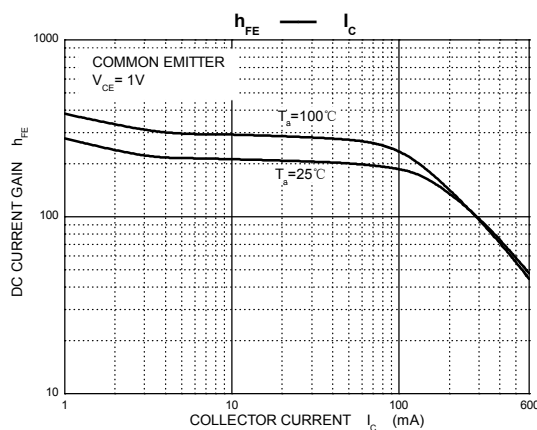
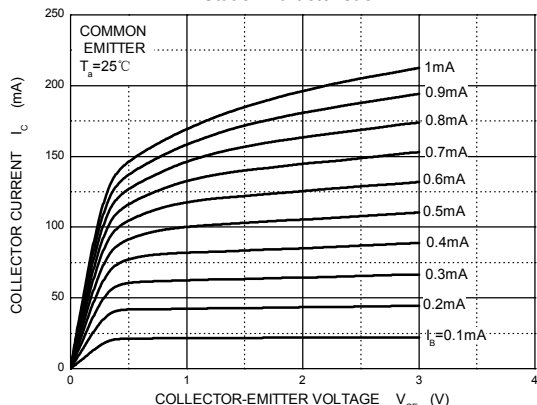
Symbol	Parameter	Value	Units
V _{CBO}	Collector-Base Voltage	-40	V
V _{CEO}	Collector-Emitter Voltage	-40	V
V _{EBO}	Emitter-Base Voltage	-5	V
I _C	Collector Current -Continuous	-0.6	A
P _C	Collector Power Dissipation	0.2	W
R _{θJA}	Thermal Resistance from Junction to Ambient	625	°C/W
T _J , T _{stg}	Operation Junction and Storage Temperature Range	-55 ~ +150	°C

■ Electrical Characteristics Ta = 25°C PNP 4403 Section

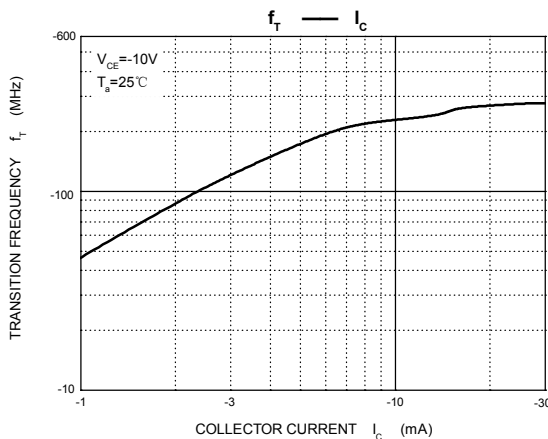
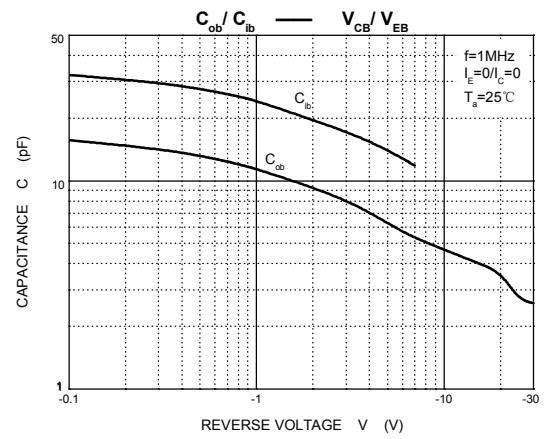
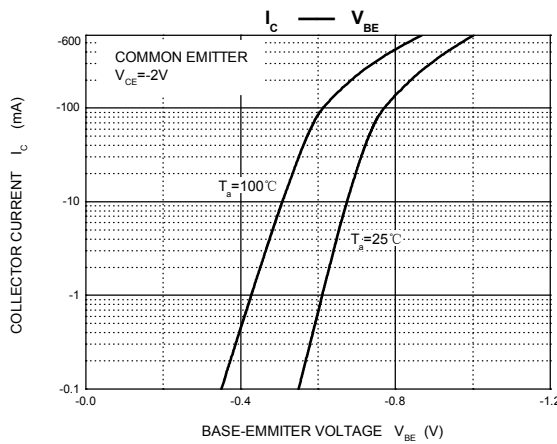
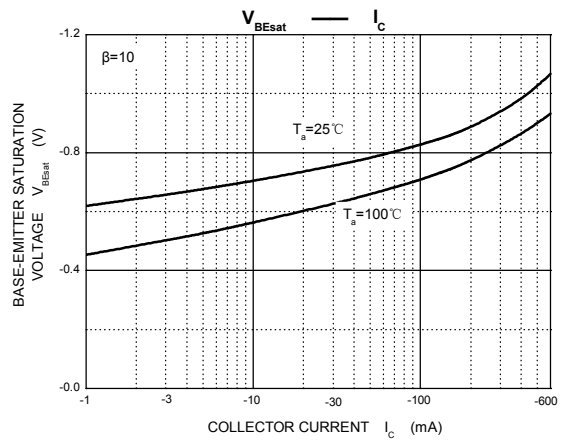
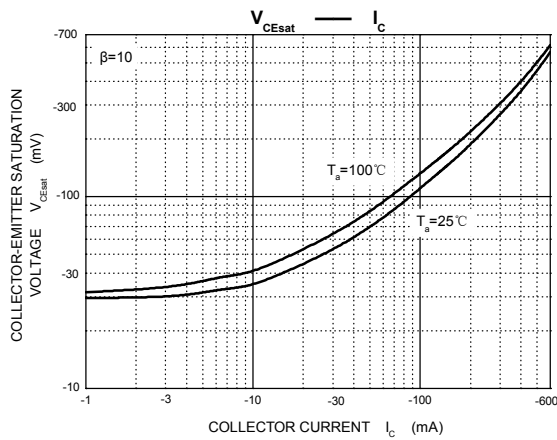
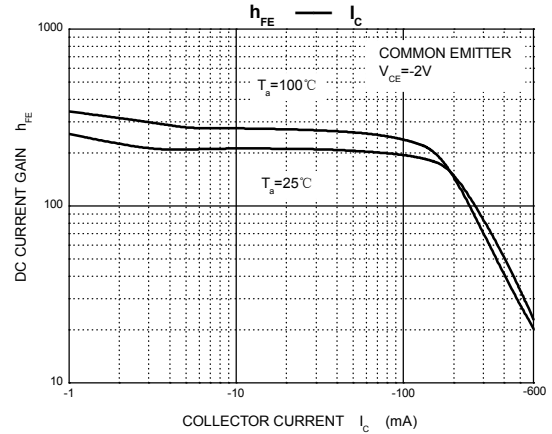
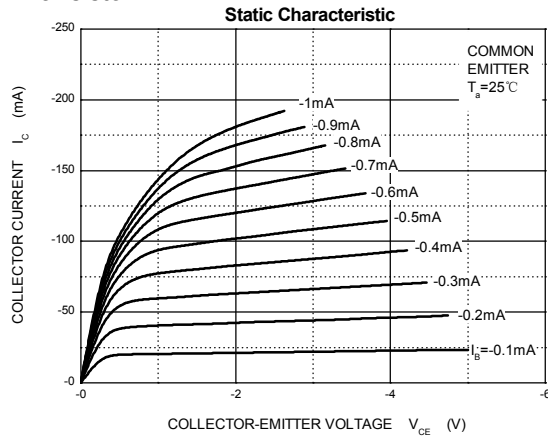
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C = -100μA, I _E = 0	-40			V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C = -1mA, I _B = 0	-40			V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E = -100μA, I _C = 0	-5			V
Collector cut-off current	I _{CBO}	V _{CB} = -50 V, I _E = 0			-0.1	μA
Collector cut-off current	I _{CEO}	V _{CE} = -35 V, I _B = 0			-0.5	μA
Emitter cut-off current	I _{EBO}	V _{EB} = -5V, I _C = 0			-0.1	μA
DC current gain	h _{FE(1)}	V _{CE} = -1 V, I _C = -0.1mA	30			
	h _{FE(2)}	V _{CE} = -1 V, I _C = -1mA	60			
	h _{FE(3)}	V _{CE} = -1 V, I _C = -10mA	100			
	h _{FE(4)}	V _{CE} = -2 V, I _C = -150mA	100		300	
	h _{FE(5)}	V _{CE} = -2 V, I _C = -500mA	20			
Collector-emitter saturation voltage	V _{CE(sat)1}	I _C = -150 mA, I _B = -15mA			-0.4	V
	V _{CE(sat)2}	I _C = -500 mA, I _B = -50mA			-0.75	V
Base-emitter saturation voltage	V _{BE(sat)1}	I _C = -150 mA, I _B = -15mA	-0.75		-0.95	V
	V _{BE(sat)2}	I _C = -500 mA, I _B = -50mA			-1.3	V
Transition frequency	f _T	V _{CE} = -10V, I _C = -20mA f = 100MHz	200			MHz
Output Capacitance	C _{ob}	V _{CB} = -10V, I _E = 0 f = 1MHz			8.5	pF
Delay time	t _d	V _{CC} = -30V, V _{BE} = -2V			15	nS
Rise time	t _r	I _C = -150mA, I _{B1} = -15mA			20	nS
Storage time	t _s	V _{CC} = -30V, I _C = -150mA			225	nS
Fall time	t _f	I _{B1} = -I _{B2} = -15mA			30	nS

NPN Transistor

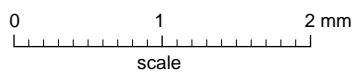
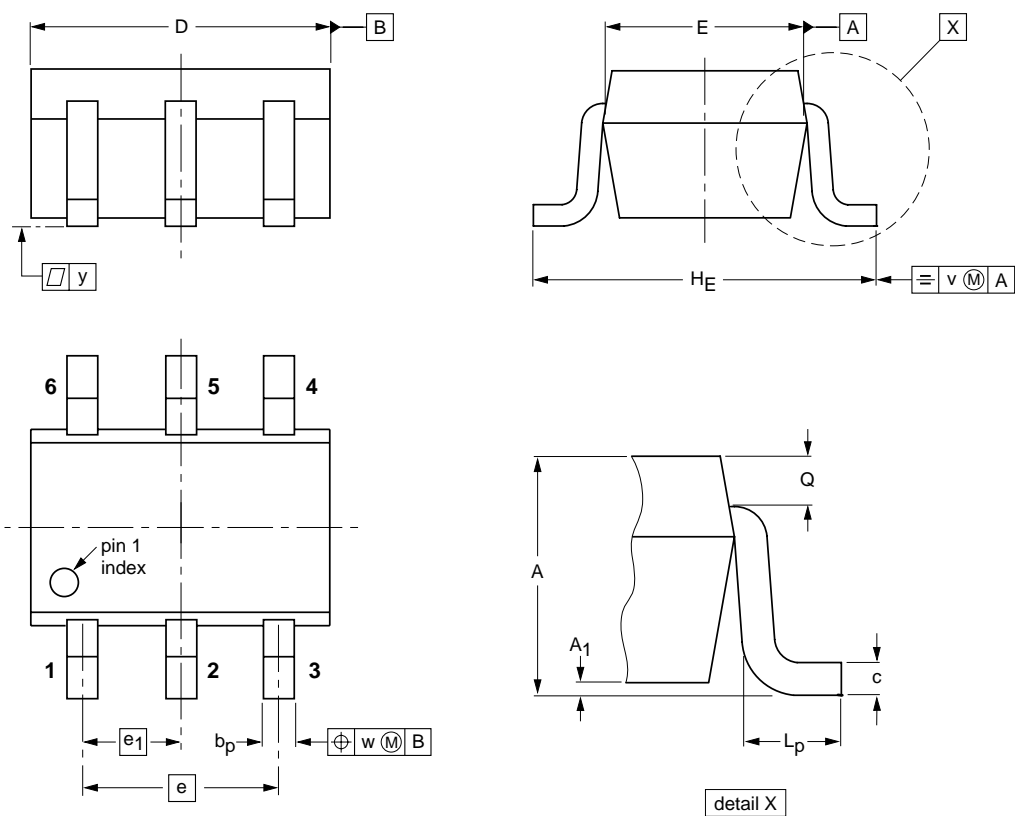
Static Characteristic



PNP Transistor



■ SOT-363



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

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