

# 2N3766, 2N3767

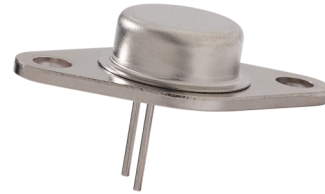


## NPN Power Silicon Transistor

Rev. V4

### Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/518
- TO-66 Package
- Designed for High Speed Switching and High Voltage Amplifier Applications



### Electrical Characteristics (25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Off Characteristics</b>					
Collector - Emitter Breakdown Voltage	$I_C = 100 \text{ mA dc, 2N3766}$ $I_C = 100 \text{ mA dc, 2N3767}$	$V_{(BR)CEO}$	V dc	60 80	—
Collector - Base Cutoff Current	$V_{CB} = 80 \text{ Vdc 2N3766}$ $V_{CB} = 100 \text{ V dc 2N3767}$	$I_{CBO}$	$\mu\text{A dc}$	—	10 10
Collector - Emitter Cutoff Current	$V_{CE} = 60 \text{ V dc 2N3766}$ $V_{CE} = 80 \text{ V dc 2N3767}$	$I_{CEO}$	$\mu\text{A dc}$	—	500
Collector - Emitter Cutoff Current	$V_{CE} = 80 \text{ V dc, } V_{BE} = 1.5 \text{ Vdc, 2N3766}$ $V_{CE} = 100 \text{ Vdc, } V_{BE} = 1.5 \text{ Vdc, 2N3767}$	$I_{CEX1}$	$\mu\text{A dc}$	—	10 10
Collector - Emitter Cutoff Current	$T_A = +150^\circ\text{C}$ $V_{BE} = 1.5 \text{ V dc}$ $V_{CE} = 50 \text{ V dc, 2N3766}$ $V_{CE} = 70 \text{ V dc, 2N3767}$	$I_{CEX2}$	$\text{mA dc}$	—	1.0 1.0
Emitter - Base Cutoff Current	$V_{EB} = 6 \text{ V dc}$	$I_{EBO}$	$\mu\text{A dc}$	—	500
<b>On Characteristics</b>					
Forward Current Transfer Ratio	$V_{CE} = 5 \text{ V dc, } I_C = 50 \text{ mA dc}$ $V_{CE} = 5 \text{ V dc, } I_C = 500 \text{ mA dc}$ $V_{CE} = 10 \text{ V dc, } I_C = 1 \text{ A dc}$	$h_{FE1}$ $h_{FE2}$ $h_{FE3}$	-	30 40 20	160
Forward Current Transfer Ratio	$T_A = -55^\circ\text{C}$ $V_{CE} = 5.0 \text{ V dc, } I_C = 0.5 \text{ A dc}$	$h_{FE4}$	-	13	
Base - Emitter Voltage (non-saturated)	$V_{CE} = 10 \text{ V dc, } I_C = 1.0 \text{ A dc}$	$V_{BE}$	V dc	—	1.5
Collector - Emitter Voltage (saturated)	$I_C = 1.0 \text{ A dc, } I_B = 0.1 \text{ A dc}$	$V_{CE(SAT)1}$	V dc	—	2.5
Collector - Emitter Voltage (saturated)	$I_C = 0.5 \text{ A dc, } I_B = 0.05 \text{ A dc}$	$V_{CE(SAT)2}$	V dc	—	1.0
Base - Emitter Voltage (saturated)	$I_C = 1.0 \text{ A dc, } I_B = 0.1 \text{ A dc}$	$V_{BE(SAT)1}$	V dc	—	1.5

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Dynamic Characteristics					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$V_{CE} = 10 \text{ V dc}, I_C = 500 \text{ mA dc}, f = 10 \text{ MHz}$	$ h_{FE} $	-	1	8
Open Capacitance (Open Circuit)	$V_{CB} = 10 \text{ V dc}, I_E = 0, 0.1 \text{ MHz} \leq f \leq 1 \text{ MHz}$	$C_{obo}$	pF	—	50

### Absolute Maximum Ratings (25°C unless otherwise specified)

Ratings	Symbol	Value
Collector - Emitter Voltage 2N3766 2N3767	$V_{CEO}$	60 V dc 80 V dc
Collector - Base Voltage 2N3766 2N3767	$V_{CBO}$	80 V dc 100 V dc
Emitter - Base Voltage	$V_{EBO}$	6.0 V dc
Base Current	$I_B$	2.0 A dc
Collector Current	$I_C$	4.0 A dc
Total Power Dissipation @ $T_C = +25^\circ\text{C}^1$	$P_T$	25 W
Junction & Storage Temperature Range	$T_J, T_{STG}$	-65°C to +200°C

1. Between  $T_C = +25^\circ\text{C}$  and  $T_C = +200^\circ\text{C}$ , linear derating factor (average) = 143m/W°C.

### Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	7.0°C/W

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## Electrical Characteristics (25°C unless otherwise specified)

Pulse Response	Test Conditions	Symbol	Units	Min.	Max.
Turn-On Time	$V_{CC} = 30 \text{ V dc}, I_C = 0.5 \text{ A dc}, I_{B1} = 0.05 \text{ A dc}$	$t_{on}$	$\mu\text{s}$	—	0.25
Turn-Off Time	$V_{CC} = 30 \text{ Vdc}, I_C = 0.5 \text{ A dc}, I_{B1} = I_{B2} = .05 \text{ A dc}$	$t_{off}$	$\mu\text{s}$	—	2.5
Safe Operating Area					
DC Tests:	$T_C = +25 \text{ }^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$				
Test 1:	$V_{CE} = 6.25 \text{ V dc}, I_C = 4 \text{ A dc}$				
Test 2:	$V_{CE} = 20 \text{ V dc}, I_C = 1.25 \text{ A dc}$				
Test 3:	$V_{CE} = 50 \text{ V dc}, I_C = 150 \text{ mA dc}, 2\text{N}3766$ $V_{CE} = 65 \text{ V dc}, I_C = 150 \text{ mA dc}, 2\text{N}3767$				

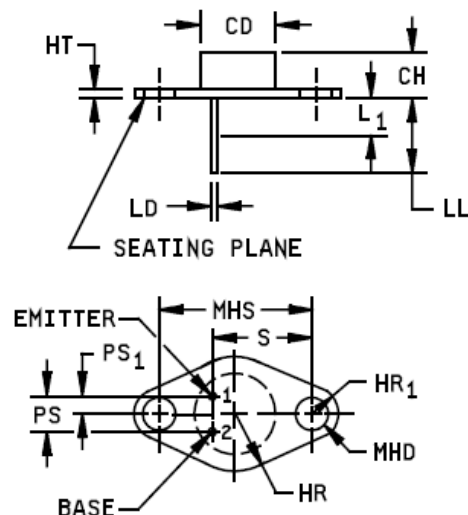
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### Outline Drawing (TO-66)

Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.620		15.76	
CH	.250	.340	6.35	8.64	
HR		.350		8.89	4
HT	.050	.075	1.27	1.91	
HR <sub>1</sub>	.115	.145	2.92	3.68	4
LD	.028	.034	0.71	0.86	4, 6
LL	.360	.500	9.14	12.70	
L <sub>1</sub>		.050		1.27	6
MHD	.142	.152	3.61	3.86	4
MHS	.958	.962	24.33	24.43	
PS	.190	.210	4.83	5.33	3
PS <sub>1</sub>	.093	.107	2.36	2.72	3
S	.570	.590	14.48	14.99	



#### NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. These dimensions should be measured at points .050 inch (1.27 mm) +.005 inch (0.13 mm) -.000 inch (0.00 mm) below seating plane. When gauge is not used, measurement will be made at the seating plane.
4. Two places.
5. The seating plane of the header shall be flat within .001 inch (0.03 mm) concave to .004 inch (0.10 mm) convex inside a .930 inch (23.62 mm) diameter circle on the center of the header and flat within .001 inch (0.03 mm) concave to .006 inch (0.15 mm) convex overall.
6. Lead diameter shall not exceed twice LD within L<sub>1</sub>.
7. Lead number 1 is the emitter, lead 2 is the base, case is the collector.
8. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi$ x symbology.

FIGURE 1. Physical dimensions (similar to TO-66).

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