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.
Off Characteristics					
Collector - Emitter Breakdown Voltage	I_C = 100 mA dc, 2N3766 I_C = 100 mA dc, 2N3767	$V_{(BR)CEO}$	V dc	60 80	—
Collector - Base Cutoff Current	VCB = 80 Vdc 2N3766 VCB = 100 V dc 2N3767	I_{CBO}	µA dc	—	10 10
Collector - Emitter Cutoff Current	V_{CE} = 60 V dc 2N3766 V_{CE} = 80 V dc 2N3767	I_{CEO}	µA dc	—	500
Collector - Emitter Cutoff Current	V_{CE} = 80 V dc, V_{BE} = 1.5 Vdc, 2N3766 V_{CE} = 100 Vdc, V_{BE} = 1.5 Vdc, 2N3767	I_{CEX1}	µA dc	—	10 10
Collector - Emitter Cutoff Current	T_A = +150°C V_{BE} = 1.5 V dc V_{CE} = 50 V dc, 2N3766 V_{CE} = 70 V dc, 2N3767	I_{CEX2}	mA dc	—	1.0 1.0
Emitter - Base Cutoff Current	V_{EB} = 6 V dc	I_{EBO}	µA dc	—	500
On Characteristics					
Forward Current Transfer Ratio	V_{CE} = 5 V dc, I_C = 50 mA dc V_{CE} = 5 V dc, I_C = 500 mA dc V_{CE} = 10 V dc, I_C = 1 A dc	h_{FE1} h_{FE2} h_{FE3}	-	30 40 20	160
Forward Current Transfer Ratio	T_A = -55°C V_{CE} = 5.0 V dc, I_C = 0.5 A dc	h_{FE4}	-	13	
Base - Emitter Voltage (non-saturated)	V_{CE} = 10 V dc, I_C = 1.0 A dc	V_{BE}	V dc	—	1.5
Collector - Emitter Voltage (saturated)	I_C = 1.0 A dc, I_B = 0.1 A dc	$V_{CE(SAT)1}$	V dc	—	2.5
Collector - Emitter Voltage (saturated)	I_C = 0.5 A dc, I_B = 0.05 A dc	$V_{CE(SAT)2}$	V dc	—	1.0
Base - Emitter Voltage (saturated)	I_C = 1.0 A dc, I_B = 0.1 A dc	$V_{BE(SAT)1}$	V dc	—	1.5

1.

Dynamic Characteristics					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	V_{CE} = 10 V dc, I_C = 500 mA dc, f = 10 MHz	$\lvert h_{FE} \rvert$	-	1	8
Open Capacitance (Open Circuit)	V_{CB} = 10 V dc, I_E = 0, 0.1 MHz ≤ f ≤ 1 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°C[1]	P_T	25 W
Junction & Storage Temperature Range	T_J, T_{STG}	-65°C to +200°C

1. Between T_C = +25°C and T_C = +200°C, linear derating factor (average) = 143m/W°C.

Thermal Characteristics

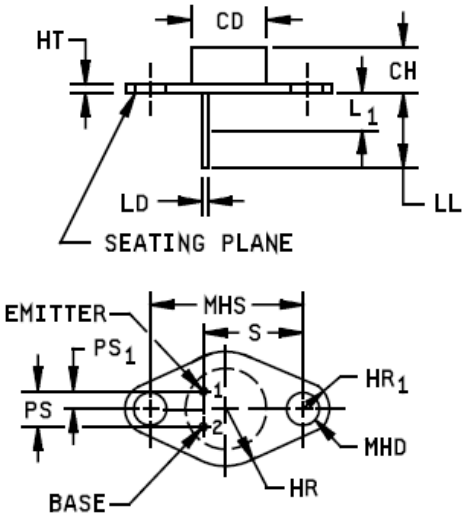
Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	7.0°C/W

Electrical Characteristics (25°C unless otherwise specified)

Pulse Response	Test Conditions	Symbol	Units	Min.	Max.
Turn-On Time	V_{CC} = 30 V dc, I_C = 0.5 A dc, I_{B1} = 0.05 A dc	t_{on}	µs	—	0.25
Turn-Off Time	V_{CC} = 30 Vdc, I_C = 0.5 A dc, I_{B1} = I_{B2} = .05 A dc	t_{off}	µs	—	2.5
Safe Operating Area					
DC Tests:	T_C = +25 °C, I Cycle, t = 1.0 s				
Test 1:	V_{CE} = 6.25 V dc, I_C = 4 A dc				
Test 2:	V_{CE} = 20 V dc, I_C = 1.25 A dc				
Test 3:	V_{CE} = 50 V dc, I_C = 150 mA dc, 2N3766 V_{CE} = 65 V dc, I_C = 150 mA dc, 2N3767				

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_1	.115	.145	2.92	3.68	4
LD	.028	.034	0.71	0.86	4, 6
LL	.360	.500	9.14	12.70	
L_1		.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_1	.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_1.
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 ϕx symbology.

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

Safe Operating Area

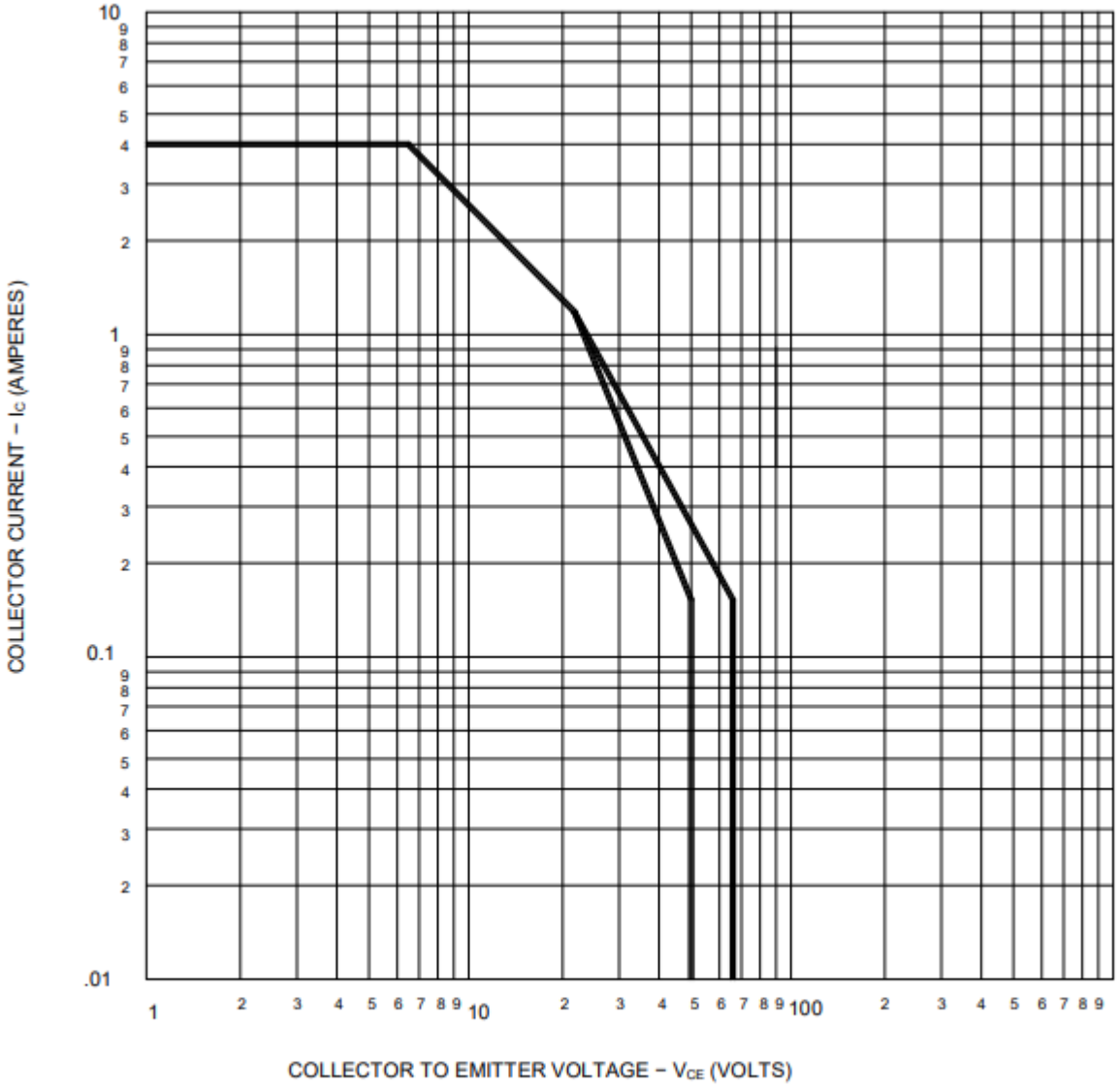


FIGURE 3. Maximum safe operating area graph (continuous dc) for types 2N3766 and 2N3767.