

2N3584, 2N3585



NPN Power Silicon Transistor

Rev. V1

Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/384
- 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	$I_C = 10 \text{ mA dc}$, 2N3584 $I_C = 10 \text{ mA dc}$, 2N3585	$V_{(BR)CEO}$	V dc	250 300	—
Collector - Base Breakdown Voltage	$I_C = 15 \text{ mA dc}$	$V_{(BR)CBO}$	V dc	375 500	—
Collector - Emitter Cutoff Current	$V_{CE} = 150 \text{ V dc}$	I_{CEO}	mA dc	—	5.0
Collector - Emitter Cutoff Current	$V_{CE} = 300 \text{ V dc}$, $V_{BE} = -1.5 \text{ Vdc}$, 2N3584 $V_{CE} = 400 \text{ Vdc}$, $V_{BE} = -1.5 \text{ Vdc}$, 2N3585	I_{CEX1}	mA dc	—	1.0 1.0
Collector - Emitter Cutoff Current	$T_A = +150^\circ\text{C}$ $V_{BE} = -1.5 \text{ V dc}$ $V_{CE} = 300 \text{ V dc}$, 2N3584 $V_{CE} = 400 \text{ V dc}$, 2N3585	I_{CEX2}	mA dc	—	2.0 2.0
Emitter - Base Cutoff Current	$V_{EB} = 6 \text{ V dc}$	I_{EBO}	mA dc	—	0.5
On Characteristics					
Forward Current Transfer Ratio	$V_{CE} = 10 \text{ V dc}$, $I_C = 1 \text{ A dc}$ $V_{CE} = 10 \text{ V dc}$, $I_C = 100 \text{ mA dc}$	h_{FE1} h_{FE2}	-	25 40	100 —
Collector - Emitter Voltage (saturated)	$I_C = 1 \text{ A dc}$, $I_B = 0.125 \text{ A dc}$	$V_{CE(SAT)}$	V dc	—	0.75
Emitter - Base Voltage (saturated)	$I_C = 1 \text{ A dc}$, $I_B = 0.1 \text{ A dc}$	$V_{BE(SAT)}$	Vdc	—	1.4
Dynamic Characteristics					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 200 \text{ mA dc}$, $V_{CE} = 10 \text{ V dc}$, $f = 5 \text{ MHz}$	$ h_{FE} $	-	3.0	15
Open Circuit Output Capacitance	$V_{CB} = 10 \text{ V dc}$, $I_E = 0$, $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	C_{obo}	pF	—	120
Small-Signal, Short-Circuit Forward-Current Transfer Ratio	$V_{CE} = 10 \text{ V dc}$, $I_C = 1 \text{ A dc}$, $f = 1 \text{ kHz}$	h_{fe}		25	200
Second Breakdown, Collector Current, Base Forward Biased	$V_{CE} = 100 \text{ V dc}$	SBIC	mA dc	350	—

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Absolute Maximum Ratings

Ratings	Symbol	Value
Collector - Emitter Voltage 2N3584 2N3585	V_{CEO}	250 V dc 300 V dc
Collector - Base Voltage 2N3584 2N3585	V_{CBO}	375 V dc 500 V dc
Emitter - Base Voltage	V_{EBO}	6.0 V dc
Collector - Emitter Voltage 2N3584 2N3585	V_{CER}	300 V dc 400 V dc
Base Current	I_B	1.0 A dc
Collector Current	I_C	2.0 A dc
Total Power Dissipation @ $T_A = +25^\circ\text{C}$	P_T	2.5 W
Total Power Dissipation @ $T_C = +25^\circ\text{C}^1$	P_T	35 W
Junction & Storage Temperature Range	T_J, T_{STG}	-65°C to $+200^\circ\text{C}$

1. Derate linearly, 200 mW / °C between $T_C > 25^\circ\text{C}$

Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	5.0°C/W

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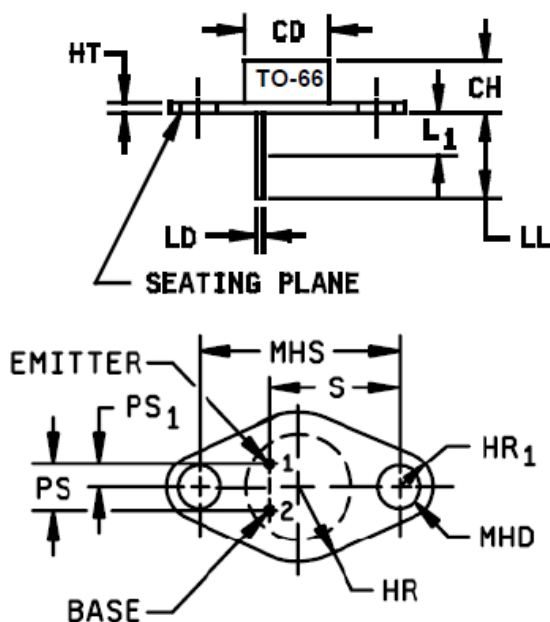
Pulse Response	Test Conditions	Symbol	Units	Min.	Max.
Turn-On Time	$V_{CC} = 30 \text{ V dc}; I_C = 1 \text{ A dc};$ $I_B = 100 \text{ mA dc}; R_C = 29\Omega$	t_{on}	μs	—	3.0
Turn-Off Time	$V_{CC} = 30 \text{ Vdc}; I_C = 1 \text{ A dc};$ $I_{B1} = -I_{B2} = 100 \text{ mA dc}; R_C = 29\Omega$	t_{off}	μs	—	7.0
Safe Operating Area					
DC Tests:	$T_C = +25 \text{ }^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$				
Test 1:	$V_{CE} = 17.5 \text{ V dc}, I_C = 2 \text{ A dc}$				
Test 2:	$V_{CE} = 100 \text{ V dc}, I_C = 350 \text{ mA dc}$				
Test 3:	$V_{CE} = 250 \text{ V dc}, I_C = 37 \text{ mA dc}, 2\text{N}3584$ $V_{CE} = 300 \text{ V dc}, I_C = 17 \text{ mA dc}, 2\text{N}3585$				

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Outline Drawing (TO-66)



Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.620		15.75	3
CH	.250	.340	6.35	8.64	
HT	.050	.075	1.27	1.91	3
HR		.350		8.89	
HR ₁	.115	.145	2.92	3.68	6
LD	.028	.034	0.71	0.86	5, 9
LL	.360	.500	9.14	12.70	5
L ₁		.050		1.27	5, 9
MHD	.142	.152	3.61	3.86	7
MHS	.958	.962	24.33	24.43	
PS	.190	.210	4.83	5.33	4
PS ₁	.093	.107	2.36	2.72	4
S	.570	.590	14.48	14.99	4

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Body contour is optional within zone defined by CD.
4. These dimensions should be measured at points .050 inch (1.27 mm) to .055 inch (1.40 mm) below seating plane. When gauge is not used, measurement will be made at seating plane.
5. Both terminals.
6. At both ends.
7. Two holes.
8. The collector shall be electrically connected to the case.
9. LD applies between L₁ and LL. Lead diameter shall not exceed twice LD within L₁.
10. Pin 1 is the emitter, pin 2 is the base. The collector shall be electrically connected to the case.
11. In accordance with ASME Y14.5M, diameters are equivalent to \varnothing x symbology.

FIGURE 1. Physical dimensions (TO-66).

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