

NPN DARLINGTON POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/523

Devices

2N6383

2N6384

2N6385

Qualified Level

JAN, JANTX
JANTXV

MAXIMUM RATINGS

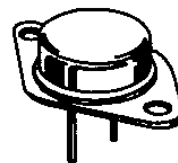
Ratings	Symbol	2N6383	2N6384	2N6385	Unit
Collector-Emitter Voltage	V_{CEO}	40	60	80	Vdc
Collector-Base Voltage	V_{CBO}	40	60	80	Vdc
Emitter-Base Voltage	V_{EBO}	5.0			Vdc
Base Current	I_B	0.25			Adc
Collector Current	I_C	10			Adc
Total Power Dissipation @ $T_A = +25^{\circ}\text{C}$ ⁽¹⁾ @ $T_C = +25^{\circ}\text{C}$ ⁽²⁾	P_T	6.0 100			W W
Operating & Storage Temperature	T_{op}, T_{stg}	-55 to +175			$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.75	$^{\circ}\text{C/W}$

1) Derate linearly 34.2 mW/ $^{\circ}\text{C}$ above $T_A > +25^{\circ}\text{C}$

2) Derate linearly 571 mW/ $^{\circ}\text{C}$ above $T_C > +25^{\circ}\text{C}$



TO-3* (TO-204AA)

*See Appendix A for package outline

ELECTRICAL CHARACTERISTICS ($T_C = +25^{\circ}\text{C}$ unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}$	2N6383 2N6384 2N6385	$V_{(BR)CEO}$	40 60 80	Vdc
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, R_{BB} = 100 \Omega$	2N6383 2N6384 2N6385	$V_{(BR)CER}$	40 60 80	Vdc
Collector-Base Cutoff Current $V_{CE} = 40 \text{ Vdc}$ $V_{CE} = 60 \text{ Vdc}$ $V_{CE} = 80 \text{ Vdc}$	2N6383 2N6384 2N6385	I_{CBO}	1.0 1.0 1.0	mAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{ Vdc}$	I_{EBO}		5.0	mAdc
Collector-Emitter Cutoff Current $V_{CE} = 40 \text{ Vdc}$ 2N6383 $V_{CE} = 60 \text{ Vdc}$ 2N6384 $V_{CE} = 80 \text{ Vdc}$ 2N6385	I_{CEO}		1.0 1.0 1.0	mAdc
Collector-Emitter Cutoff Current $V_{CE} = 40 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$ 2N6383 $V_{CE} = 60 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$ 2N6384 $V_{CE} = 80 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$ 2N6385	I_{CEX}		0.3 0.3 0.3	mAdc

ON CHARACTERISTICS ⁽³⁾

Forward-Current Transfer Ratio $I_C = 5.0 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$ $I_C = 10 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$	h_{FE}	1,000 100	20,000	
Collector-Emitter Saturation Voltage $I_C = 5.0 \text{ Adc}, I_B = 10 \text{ mAdc}$ $I_C = 10 \text{ Adc}, I_B = 0.1 \text{ Adc}$	$V_{CE(sat)}$		2.0 3.0	Vdc
Base-Emitter Voltage $I_C = 5.0 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$ $I_C = 10 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$	$V_{BE(on)}$		2.8 4.5	Vdc

DYNAMIC CHARACTERISTICS

Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}, f = 1.0 \text{ MHz}$	$ h_{fe} $	20	300	
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}		200	pF

SWITCHING CHARACTERISTICS

Turn-On Time $V_{CC} = 30 \text{ Vdc}; I_C = 5.0 \text{ Adc}; I_{B1} = 20 \text{ mAdc}$	t_{on}		2.5	μs
Turn-Off Time $V_{CC} = 30 \text{ Vdc}; I_C = 5.0 \text{ Adc}; I_{B1} = -I_{B2} = 20 \text{ mAdc}$	t_{off}		10	μs

SAFE OPERATING AREA

DC Tests $T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$				
Test 1 $V_{CE} = 10 \text{ Vdc}, I_C = 10 \text{ Adc}$ All Types				
Test 2 $V_{CE} = 30 \text{ Vdc}, I_C = 3.33 \text{ Adc}$ All Types				
Test 3 $V_{CE} = 40 \text{ Vdc}, I_C = 1.5 \text{ Adc}$ 2N6383 $V_{CE} = 60 \text{ Vdc}, I_C = 0.4 \text{ Adc}$ 2N6384 $V_{CE} = 80 \text{ Vdc}, I_C = 0.16 \text{ Adc}$ 2N6385				

(3) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.