TECHNICAL DATA

NPN DARLINGTON POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/472

Devices				***Qualified Level***
2N6350	**2N6351**	**2N6352**	**2N6353**	**JAN** **JANTX** **JANTXV**

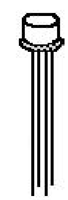
MAXIMUM RATINGS

Ratings	Symbol	2N6350 2N6352	2N6351 2N6353	Units
Collector-Emitter Voltage	V_{CER}	80	150	Vdc
Collector-Base Voltage	V_{CBO}	80	150	Vdc
Emitter-Base Voltage	V_{EBO}	12 6.0		Vdc Vdc
Base Current	I_B	0.5		Adc
Collector Current	I_C	5.0 10 (1)		Adc Adc
		2N6350 2N6351	**2N6352 2N6353**	
Total Power Dissipation @ $T_A = 25^0C$ @ $T_C = 100^0C$	P_T	1.0 (2) 5.0 (3)	2.0 (4) 25 (5)	W W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		^0C

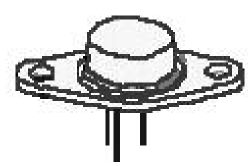
THERMAL CHARACTERISTICS

Characteristics	Symbol	2N6350 2N6351	2N6352 2N6353	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	20	4.0	$^0C/W$

1) Applies for $t_p \leq 10$ ms, Duty cycle $\leq 50\%$
2) Derate linearly @ 5.72 mW/^0C above $T_A > 25^0C$
3) Derate linearly @ 50 mW/^0C above $T_C > 100^0C$
4) Derate linearly @ 11.4 mW/^0C above $T_A > 25^0C$
5) Derate linearly @ 250 mW/^0C above $T_C > 100^0C$



2N6350, 2N6351
TO-33*



2N6352, 2N6353
TO-24* (TO-213AA)

*See Appendix A for package outline

ELECTRICAL CHARACTERISTICS ($T_C = 25^0C$ unless otherwise noted)

Characteristics		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage $I_C = 25$ mAdc, $R_{B1E} = 2.2$ kΩ, $R_{B2E} = 100$ Ω	2N6350, 2N6352 2N6351, 2N6353	$V_{(BR)CER}$	80 150		Vdc

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ELECTRICAL CHARACTERISTICS (con't)

Characteristics		Symbol	Min.	Max.	Unit
Emitter-Base Breakdown Voltage I_{EB} = 12 mAdc, Base 1 Open I_{EB} = 12 mAdc, Base 2 Open		$V_{(BR)EBO}$	6.0 12		Vdc
Collector-Emitter Cutoff Current V_{EB1} = 2.0 Vdc, R_{B2E} = 100 Ω, V_{CE} = 80 Vdc V_{EB1} = 2.0 Vdc, R_{B2E} = 100 Ω, V_{CE} = 150 Vdc	 2N6350, 2N6352 2N6351, 2N6353	I_{CEX}		1.0 1.0	μAdc

ON CHARACTERISTICS (6)

Characteristics		Symbol	Min.	Max.	Unit
Forward-Current Transfer Ratio I_C = 1.0 Adc, V_{CE} = 5.0 Vdc, R_{B2E} = 1.0 Ω I_C = 5.0 Adc, V_{CE} = 5.0 Vdc, R_{B2E} = 100 Ω I_C = 10 Adc, V_{CE} = 5.0 Vdc, R_{B2E} = 100 Ω	 2N6350, 2N6352	h_{FE}	2,000 2,000 400	 10,000 	
I_C = 1.0 Adc, V_{CE} = 5.0 Vdc, R_{B2E} = 1.0 Ω I_C = 5.0 Adc, V_{CE} = 5.0 Vdc, R_{B2E} = 100 Ω I_C = 10 Adc, V_{CE} = 5.0 Vdc, R_{B2E} = 100 Ω	2N6351, 2N6353		1,000 1,000 200	 10,000 	
Collector-Emitter Saturation Voltage I_C = 5.0 Adc, R_{B2E} = 100 Ω, I_{B1} = 5.0 mAdc I_C = 5.0 Adc, R_{B2E} = 100 Ω, I_{B1} = 10 mAdc	 2N6350, 2N6352 2N6351, 2N6353	$V_{CE(sat)}$		1.5 2.5	Vdc
Base-Emitter Voltage I_C = 5.0 Adc, V_{CE} = 5.0 Vdc, R_{B2E} = 100 Ω		$V_{BE1(on)}$		2.5	Vdc

DYNAMIC CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I_C = 1.0 Adc, V_{CE} = 10 Vdc, R_{B2E} = 100 Ω; f = 10 MHz	$\lvert h_{fe} \rvert$	5.0	25	
Output Capacitance V_{CB1} = 10 Vdc, 100 kHz ≤ f ≤ 1.0 MHz, Base 2 Open	C_{obo}		120	pF

SWITCHING CHARACTERISTICS

Characteristics		Symbol	Min.	Max.	Unit
Turn-On Time V_{CC} = 30 Vdc; I_C = 5.0 Adc	 (See fig 4 for 2N6350, 2N6352) (See fig 5 for 2N6350, 2N6352)	t_{on}		0.5	μs
Turn-Off Time V_{CC} = 30 Vdc; I_C = 5.0 Adc	 (See fig 4 for 2N6350, 2N6352) (See fig 5 for 2N6350, 2N6352)	t_{off}		1.2	μs

SAFE OPERATING AREA

DC Tests

T_C = +100^{0}C, 1 Cycle, t ≥ 1.0 s, $t_r + t_f$ = 10 μs, R_{B2E} = 100 Ω (See fig 6 for 2N6350, 2N6351)

Test 1
V_{CE} = 1.5Vdc, I_C = 3.3 Adc — 2N6350, 2N6351

Test 2
V_{CE} = 30 Vdc, I_C = 167 mAdc — 2N6350, 2N6351

Test 3
V_{CE} = 80 Vdc, I_C = 35 mAdc — 2N6350

Test 4
V_{CE} = 150 Vdc, I_C = 13 mAdc — 2N6351

T_C = +100^{0}C, 1 Cycle, t ≥ 1.0 s, $t_r + t_f$ = 10 μs, R_{B2E} = 100 Ω (See fig 7 for 2N6352, 2N6353)

Test 1
V_{CE} = 5.0Vdc, I_C = 5.0 Adc — 2N6352, 2N6353

Test 2
V_{CE} = 10 Vdc, I_C = 2.5 Adc — 2N6352, 2N6353

Test 3
V_{CE} = 80 Vdc, I_C = 95 mAdc — 2N6352

Test 4
V_{CE} = 150 Vdc, I_C = 35 mAdc — 2N6353

(6) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤ 2.0%.