Microsemi LAWRENCE

TECHNICAL DATA

PNP DARLINGTON POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/527

Devices			*Qualified Level*
2N6648	**2N6649**	**2N6650**	**JANTX JANTXV**

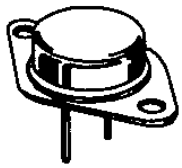
MAXIMUM RATINGS

Ratings	Symbol	2N6648	2N6649	2N6650	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 @ $T_A = +25^0C$ (1) @ $T_C = +25^0C$ (2)	P_T	5.0 85			W W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +175			^0C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.76	$^0C/W$

1) Derate linearly 33.3 mW/^{0}C for $T_A > +25^0C$
2) Derate linearly 567 mW/^{0}C for $T_C > +25^0C$



TO-3* (TO-204AA)

*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 = 200 mAdc	2N6648	$V_{(BR)CEO}$	-40		Vdc
	2N6649		-60		
	2N6650		-80		
Collector-Emitter Breakdown Voltage					
I_C = 200 mAdc, R_{BB} = 100 Ω	2N6648	$V_{(BR)CER}$	-40		Vdc
	2N6649		-60		
	2N6650		-80		
Collector-Base Cutoff Current					
V_{CB} = -40 Vdc	2N6648	I_{CBO}		-1.0	mAdc
V_{CB} = -60 Vdc	2N6649			-1.0	
V_{CB} = -80 Vdc	2N6650			-1.0	

ELECTRICAL CHARACTERISTICS (con't)

Characteristics		Symbol	Min.	Max.	Unit
Emitter-Base Cutoff Current V_{EB} = 5.0 Vdc		I_{EBO}		-10	mAdc
Collector-Emitter Cutoff Current V_{CE} = -40 Vdc V_{CE} = -60 Vdc V_{CE} = -80 Vdc	 2N6648 2N6649 2N6650	I_{CEO}		 -1.0 -1.0 -1.0	mAdc
Collector-Emitter Cutoff Current V_{CE} = -40 Vdc, V_{BE} = 1.5 Vdc V_{CE} = -60 Vdc, V_{BE} = 1.5 Vdc V_{CE} = -80 Vdc, V_{BE} = 1.5 Vdc	 2N6648 2N6649 2N6650	I_{CEX}		 -0.3 -0.3 -0.3	mAdc
ON CHARACTERISTICS (3)					
Forward-Current Transfer Ratio I_C = -1.0 Adc, V_{CE} = 3.0 Vdc I_C = -5.0 Adc, V_{CE} = 3.0 Vdc I_C = -10 Adc, V_{CE} = 3.0 Vdc		h_{FE}	 300 1,000 100	 20,000	
Collector-Emitter Saturation Voltage I_C =-5 .0 Adc, I_B = -10 mAdc I_C = -10 Adc, I_B = -0.1 Adc		$V_{CE(sat)}$		-2.0 -3.0	Vdc
Base-Emitter Voltage I_C = -5.0 Adc, V_{CE} = -3.0 Vdc I_C = -10 Adc, V_{CE} = -3.0 Vdc		$V_{BE(on)}$		-2.8 -4.5	Vdc
DYNAMIC CHARACTERISTICS					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I_C =- 1.0 Adc, V_{CE} = -5.0 Vdc, f = 1.0 MHz		$\lvert h_{fe} \rvert$	50	400	
Output Capacitance V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz		C_{obo}		300	pF
SWITCHING CHARACTERISTICS					
Turn-On Time V_{CC} = -30 Vdc; I_C = -5.0 Adc; I_{B1} =- 20 mAdc		t_{on}		2.5	µs
Turn-Off Time V_{CC} = -30 Vdc; I_C = -5.0 Adc; I_{B1} = -I_{B2} = 20 mAdc		t_{off}		10	µs

SAFE OPERATING AREA

DC Tests

T_C = +25^{0}C, 1 Cycle, t = 1.0 s

Test 1

V_{CE} = -8.5 Vdc, I_C = -10 Adc

Test 2

V_{CE} = -25 Vdc, I_C = -3.4 Adc

Test 3

V_{CE} = -40 Vdc, I_C = -0.9 Adc	2N6648
V_{CE} = -60 Vdc, I_C = -0.3 Adc	2N6449
V_{CE} = -80 Vdc, I_C = -0.14 Adc	2N6650

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