Microsemi LAWRENCE

TECHNICAL DATA

NPN HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/456

Devices		*Qualified Level*
2N5302	**2N5303**	**JANTX JANTXV**

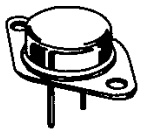
MAXIMUM RATINGS

Ratings	Symbol	2N5302	2N5303	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Collector-Base Voltage	V_{CBO}	60	80	Vdc
Emitter-Base Voltage	V_{EBO}	5.0		Vdc
Collector Current	I_C	30	20	Adc
Base Current	I_B	7.5		Adc
Total Power Dissipation @ $T_A = +25^0C$(1) @ $T_C = +100^0C$(2)	P_T	5.0 115		W $W/^0C$
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		^0C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.875	$^0C/W$

1) Derate linearly 28.57 $mW/^0C$ for $T_A = +25^0C$
2) Derate linearly 1.14 $W/^0C$ for $T_C = +100^0C$



TO-3*
(TO-204AA)

*See appendix A for package outline

ELECTRICAL CHARACTERISTICS

Characteristics		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Current I_C = 200 mAdc, I_B = 0	2N5302 2N5303	$V_{(BR)CEO}$	60 80		Vdc
Collector-Emitter Cutoff Current V_{CE} = 60 Vdc, I_B = 0 V_{CE} = 80 Vdc, I_B = 0	2N5302 2N5303	I_{CEO}		10 10	µAdc
Emitter-Base Cutoff Current V_{EB} = 5.0 Vdc, I_C = 0		I_{EBO}		5.0	µAdc
Collector-Emitter Cutoff Current V_{BE} = 1.5 Vdc, V_{CE} = 60 Vdc V_{BE} = 1.5 Vdc, V_{CE} = 80 Vdc	2N5302 2N5303	I_{CEX}		5.0 5.0	µAdc
Collector-Emitter Cutoff Current V_{CE} = 60 Vdc V_{CE} = 80 Vdc	2N5302 2N5303	I_{CBO}		5.0 5.0	µAdc

ELECTRICAL CHARACTERISTICS

Characteristics		Symbol	Min.	Max.	Unit
ON CHARACTERISTICS					
Forward-Current Transfer Ratio					
I_C = 1.0 Adc, V_{CE} = 2.0 Vdc	All Types	h_{FE}	40	60	
I_C = 15 Adc, V_{CE} = 2.0 Vdc	2N5302		15		
I_C = 10 Adc, V_{CE} = 2.0 Vdc	2N5303		15		
I_C = 30 Adc, V_{CE} = 4.0 Vdc	2N5302		5.0		
I_C = 20 Adc, V_{CE} = 4.0 Vdc	2N5303		5.0		
Base-Emitter Saturation Voltage					
I_C = 10 Adc, I_B = 1.0 Adc	All Types	$V_{BE(sat)}$		1.7	Vdc
I_C = 15 Adc, I_B = 1.5 Adc	2N5302			1.8	
I_C = 15 Adc, I_B = 1.5 Adc	2N5303			2.0	
I_C = 20 Adc, I_B = 2.0 Adc	2N5302			2.5	
I_C = 20 Adc, I_B = 4.0 Adc	2N5303			2.5	
Base-Emitter Non-Saturation Voltage					
V_{CE} = 2.0 Vdc; I_C = 15 Adc	2N5302	V_{BE}		1.8	Vdc
V_{CE} = 2.0 Vdc; I_C = 10 Adc	2N5303			1.5	
V_{CE} = 4.0 Vdc; I_C = 30 Adc	2N5302			3.0	
V_{CE} = 4.0 Vdc; I_C = 20 Adc	2N5303			2.5	
Collector-Emitter Saturation Voltage					
I_C = 10 Adc, I_B = 1.0 Adc	2N5302	$V_{CE(sat)}$		0.75	Vdc
I_C = 10 Adc, I_B = 1.0 Adc	2N5303			1.0	
I_C = 15 Adc, I_B = 1.5 Adc	2N5302			1.0	
I_C = 15 Adc, I_B = 1.5 Adc	2N5303			1.5	
I_C = 20 Adc, I_B = 2.0 Adc	2N5302			2.0	
I_C = 20 Adc, I_B = 4.0 Adc	2N5303			2.0	
I_C = 30Adc, I_B = 6.0 Adc	2N5302			3.0	
DYNAMIC CHARACTERISTICS					
Magnitude of Small-Signal Short Circuit Forward Current Transfer Ratio I_C = 1.0 Adc, V_{CE} = 10 Vdc, f = 1.0 MHz		$\lvert h_{fe} \rvert$	2.0	40	
Output Capacitance V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz		C_{obo}		800	pF

SWITCHING CHARACTERISTICS

Delay Time	V_{CC} = 30 Vdc; I_C = 10 Adc; I_B = 1.0 Adc	t_d		0.2	µs
Rise Time		t_r		0.9	µs
Storage Time		t_s		2.0	µs
Fall Time		t_f		1.0	µs

SAFE OPERATING AREA

DC Tests: $T_C = 25^0$C, 1 Cycle, t ≥ 1.0 s

Test 1

V_{CE} = 6.67 Vdc, I_C = 30 Adc 2N5302

V_{CE} = 10 Vdc, I_C = 20 Adc 2N5303

Test 2

V_{CE} = 20 Vdc, I_C = 10 Adc 2N5302; 2N5303

Test 3

V_{CE} = 40 Vdc, I_C = 3.0Adc 2N5302; 2N5303

Test 4

V_{CE} = 50 Vdc, I_C = 600 mAdc 2N5302

V_{CE} = 60 Vdc, I_C = 600 mAdc 2N5303

Clamped Switching: $T_A = 25^0$C, V_{CE} = 15 Vdc

Clamp Voltage = 60 Vdc, I_C = 30 Adc 2N5302

Clamp Voltage = 80 Vdc, I_C = 20 Adc 2N5303