Microsemi LAWRENCE

TECHNICAL DATA

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/538

Devices				*Qualified Level*
2N6676	**2N6678**	**2N6691**	**2N6693**	**JAN JANTX JANTXV**

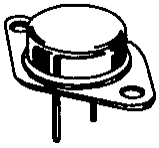
MAXIMUM RATINGS

Ratings	Symbol	2N6676 2N6691	2N6678 2N6693	Unit
Collector-Emitter Voltage	V_{CEO}	300	400	Vdc
Collector-Base Voltage	V_{CBO}	450	650	Vdc
Collector-Base Voltage	V_{CEX}	450	650	Vdc
Emitter-Base Voltage	V_{EBO}	8.0		Vdc
Base Current	I_B	5.0		Adc
Collector Current	I_C	15		Adc
		2N6676 2N6678	**2N6691 2N6693**	
Total Power Dissipation @ $T_A = 25^0C$ @ $T_C = 25^0C$(1)	P_T	6.0(2) 175	3.0(3) 175	W W
Operating & Storage Junction Temperature Range	T_{op}; T_{stg}	-65 to +200		^0C

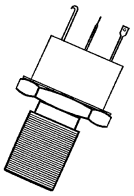
THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.0	$^0C/W$

1) Derate linearly 1.0 W/^{0}C for $T_C > 25^0C$
2) Derate linearly 34.2 mW/^{0}C for $T_A > 25^0C$
3) Derate linearly 17.1 mW/^{0}C for $T_A > 25^0C$



2N6676, 2N6678
TO-3 (TO-204AA)*



2N6691, 2N6693
TO-61*

* 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	2N6676, 2N6691 2N6678, 2N6693	$V_{(BR)CEO}$	300 400		Vdc
Collector-Emitter Cutoff Current V_{CE} = 450 Vdc, V_{BE} = 1.5 Vdc V_{CE} = 650 Vdc, V_{BE} = 1.5 Vdc	2N6676, 2N6691 2N6678, 2N6693	I_{CEX}		0.1 0.1	mAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics		Symbol	Min.	Max.	Unit
Emitter-Base Cutoff Current V_{EB} = 8.0 Vdc		I_{EBO}		2.0	mAdc
Collector-Base Cutoff Current V_{CB} = 450 Vdc V_{CB} = 650 Vdc	 2N6676, 2N6691 2N6678, 2N6693	I_{CBO}		 1.0 1.0	mAdc

ON CHARACTERISTICS (4)

Forward-Current Transfer Ratio I_C = 1.0 Adc; V_{CE} = 3.0 Vdc I_C = 15 Adc; V_{CE} = 3.0 Vdc	h_{FE}	 15 8.0	 40 20	
Collector-Emitter Saturation Voltage I_C = 15 Adc; I_B = 3.0 Adc	$V_{CE(sat)}$		1.0	Vdc
Base-Emitter Saturation Voltage I_C = 15 Adc; I_B = 3.0 Adc	$V_{BE(sat)}$		1.5	Vdc

DYNAMIC CHARACTERISTICS

Small-Signal Short-Circuit Forward Current Transfer Ratio I_C = 1.0 Adc; V_{CE} = 10 Vdc, f = 5 MHz	$\lvert h_{fe} \rvert$	3.0	10	
Output Capacitance V_{CB} = 10 Vdc; I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz	C_{obo}	150	500	pF

SWITCHING CHARACTERISTICS

Delay Time	See Figure 3 of MIL-PRF-19500/538	t_d		0.1	µs
Rise Time		t_r		0.6	µs
Storage Time		t_s		2.5	µs
Fall Time		t_f		0.5	µs
Cross-Over Time		t_c		0.5	µs

SAFE OPERATING AREA

DC Tests

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

Test 1	
V_{CE} = 11.7 Vdc, I_C = 15 Adc	All Types
Test 2	
V_{CE} = 30 Vdc, I_C = 5.9 Adc	2N6676, 2N6678
Test 3	
V_{CE} = 100 Vdc, I_C = 0.25 Adc	All Types
Test 4	
V_{CE} = 25 Vdc, I_C = 7.0 Adc	2N6691, 2N6693
Test 5	
V_{CE} = 300 Vdc, I_C = 20 mAdc	2N6676, 2N6691
V_{CE} = 400 Vdc, I_C = 10 mAdc	2N6678, 2N6693

Clamped Switching

T_A = 25^{0}C; V_{CC} = 15 Vdc

I_C = 15 Adc; Clamped Voltage = 350 Vdc	2N6676, 2N6691
I_C = 15 Adc; Clamped Voltage = 450 Vdc	2N6678, 2N6693

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

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