NEW ENGLAND SEMICONDUCTOR

TECHNICAL DATA

2N6676 JAN, JTX, JTXV
2N6678 JAN, JTX, JTXV
2N6691 JAN, JTX, JTXV
2N6693 JAN, JTX, JTXV

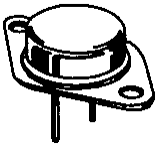
MIL-PRF QPL DEVICES

Processed per MIL-PRF-19500/538

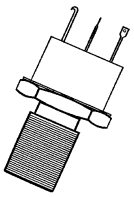
NPN POWER SWITCHING SILICON TRANSISTOR

MAXIMUM RATINGS

Ratings	Symbol	2N6676 2N6691	2N6678 2N6693	Units
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



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



2N6691, 2N6693
TO-61

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 $T_A > 25^0C$

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

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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					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I_C = 1.0 Adc, V_{CE} = 10 Vdc, f = 5.0 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

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

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