NEW ENGLAND SEMICONDUCTOR

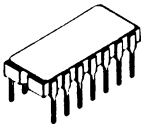
TECHNICAL DATA

2N6989 JAN, JTX, JTXV, JANS
2N6989U JAN, JTX, JTXV, JANS
2N6990 JAN, JTX, JTXV, JANS

MIL-PRF QML DEVICES

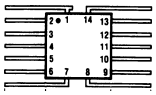
Processed per MIL-PRF-19500/559

MULTIPLE (QUAD) NPN SILICON DUAL-IN-LINE AND FLATPACK TRANSISTOR



2N6989
TO- 116

2N6989U
20 PIN LEADLESS



2N6990
14 PIN FLAT PACK

MAXIMUM RATINGS (1)

Ratings	Symbol	Value	Units
Collector-Emitter Voltage(3)	V_{CEO}	50	Vdc
Collector-Base Voltage(3)	V_{CBO}	75	Vdc
Emitter-Base Voltage(3)	V_{EBO}	6.0	Vdc
Collector Current (3)	I_C	800	mAdc
Total Power Dissipation @ $T_A = +25^0C$ 2N6989(2) 2N6989U(2) 2N6990(2)	P_D	 1.5 1.0 0.4	W
Operating & Storage Junction Temperature Range	T_{op}, T_{stg}	-65 to +200	^0C

1) Maximum voltage between transistors shall be ≥ 500 Vdc
2) Derate linearly 8.57 mW/^{0}C above $T_A = +25^0C$ for 2N6989 and 2N6989U
   Derate linearly 2.286 mW/^{0}C above $T_A = +25^0C$ for 2N6990
   Ratings apply to total package.
3) Ratings apply to each transistor in the array.

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

Characteristics	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage I_C = 10 mAdc	$V_{(BR)CEO}$	50		Vdc

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ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
Collector-Base Cutoff Current				
V_{CB} = 60 Vdc	I_{CBO}		10	ηAdc
V_{CB} = 75 Vdc; I_c= 10 μAdc			10	μAdc
Emitter-Base Cutoff Current				
V_{EB} = 4.0Vdc	I_{EBO}		10	ηAdc
V_{EB} = 6.0Vdc; I_c= 10 μAdc			10	μAdc
ON CHARACTERISTICS				
Forward-Current Transfer Ratio				
I_C = 0.1 mAdc, V_{CE} = 10 Vdc	h_{FE}	50		
I_C = 1.0 mAdc, V_{CE} = 10 Vdc		75	325	
I_C = 10 mAdc, V_{CE} = 10 Vdc		100		
I_C = 150 mAdc, V_{CE} = 10 Vdc		100	300	
I_C = 500 mAdc, V_{CE} = 10 Vdc		30		
Collector-Emitter Saturation Voltage				
I_C = 150 mAdc, I_B = 15 mAdc	$V_{CE(sat)}$		0.3	Vdc
I_C = 500 mAdc, I_B = 50 mAdc			1.0	
Base-Emitter Saturation Voltage				
I_C = 150 mAdc, I_B = 15 mAdc	$V_{BE(sat)}$	0.6	1.2	Vdc
I_C = 500 mAdc, I_B = 50 mAdc			2.0	
DYNAMIC CHARACTERISTICS				
Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio	$\lvert h_{fe} \rvert$	2.5	10	
I_C = 20 mAdc, V_{CE} = 10 Vdc, f = 100 MHz				
Forward Current Transfer Ratio	h_{fe}	50		
I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz				
Output Capacitance	C_{obo}		8.0	pF
V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz				
Input Capacitance	C_{ibo}		25	pF
V_{EB} = 0.5 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz				