



TECHNICAL DATA

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

Qualified per MIL-PRF-19500/559

Devices

2N6989
2N6989U

2N6990

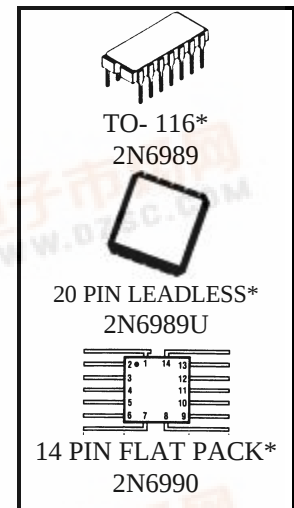
Qualified Level

JAN
JANTX
JANTXV
JANS

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	mA _{dc}
Total Power Dissipation @ $T_A = +25^{\circ}\text{C}$ 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	$^{\circ}\text{C}$

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



*See appendix A for package outline

ELECTRICAL CHARACTERISTICS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage $I_C = 10 \text{ mA}_{dc}$	$V_{(BR)CEO}$	50		Vdc
Collector-Base Cutoff Current $V_{CB} = 60 \text{ Vdc}$ $V_{CB} = 75 \text{ Vdc}; I_C = 10 \mu\text{A}_{dc}$	I_{CBO}		10 10	ηA_{dc} μA_{dc}
Emitter-Base Cutoff Current $V_{EB} = 4.0 \text{ Vdc}$ $V_{EB} = 6.0 \text{ Vdc}; I_C = 10 \mu\text{A}_{dc}$	I_{EBO}		10 10	ηA_{dc} μA_{dc}

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS ⁽⁴⁾				
Forward-Current Transfer Ratio $I_C = 0.1 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 150 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 500 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	h_{FE}	50 75 100 100 30	325 300	
Collector-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$ $I_C = 500 \text{ mAdc}, I_B = 50 \text{ mAdc}$	$V_{CE(sat)}$		0.3 1.0	Vdc
Base-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$ $I_C = 500 \text{ mAdc}, I_B = 50 \text{ mAdc}$	$V_{BE(sat)}$	0.6	1.2 2.0	Vdc

DYNAMIC CHARACTERISTICS

Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 20 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 100 \text{ MHz}$	$ h_{fe} $	2.5	8.0	
Forward Current Transfer Ratio $I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	h_{fe}	50		
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}		8.0	pF
Input Capacitance $V_{EB} = 0.5 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{ibo}		25	pF

(4) Pulse Test: Pulse Width = 300 μ s, Duty Cycle $\leq$ 2.0%.