2N6989
2N6990

CRYSTALONICS
2805 Veterans Highway
Suite 14
Ronkonkoma, N.Y. 11779

Multiple (Quad) NPN Silicon Dual-In-Line and Flatpack Small-Signal Transistors

. . .designed for general-purpose switching circuits and DC to VHF amplifier applications. Similar to 2N2222AJAN electrical devices. Complementary devices available (2N6987/88).

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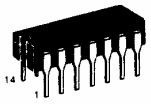
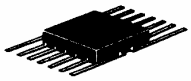
MAXIMUM RATINGS				
Rating		**Symbol**	**Value**	**Unit**
Collector-Emitter Voltage		V_{CEO}	50	Vdc
Collector-Base Voltage		V_{CB}	75	Vdc
Emitter-Base Voltage		V_{EB}	6.0	Vdc
Collector Current — Continuous		I_C	800	mAdc
			Total Device	
Total Power Dissipation		P_D		Watts
@ T_A = 25°C	2N6989		1.5	
	2N6990		0.4	mW/°C
Derate above 25°C	2N6989		8.57	
	2N6990		2.29	
Operating and Storage Junction		T_J, T_{stg}	−65 to +200	°C



CASE 632-08, STYLE 1 (TO-116) 2N6989



CASE 607-04, STYLE 1 (CERAMIC) 2N6988

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)				
Characteristic	**Symbol**	**Min**	**Max**	**Unit**
OFF CHARACTERISTICS(1)				
Collector-Emitter Breakdown Voltage (I_C = 10 mAdc)	$V_{(BR)CEO}$	50	—	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc)	$V_{(BR)CBO}$	75	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc)	$V_{(BR)EBO}$	6.0	—	Vdc
Collector Cutoff Current (V_{CB} = 60 Vdc)	I_{CBO}	—	10	nAdc
(V_{CB} = 60 Vdc, T_A = 150°C)		—	10	μAdc
Emitter-Cutoff Current (V_{BE} = 4.0 Vdc)	I_{EBO}	—	10	nAdc

(continued)

(1) Pulsed. Pulse Width ≤ 300 μs. Duty Cycle ≤ 2.0%.

ELECTRICAL CHARACTERISTICS — continued (T_A = 25°C unless otherwise noted.)				
Characteristic	**Symbol**	**Min**	**Max**	**Unit**
ON CHARACTERISTICS(1)				
DC Current Gain (V_{CE} = 10 Vdc, I_C = 0.1 mAdc) (V_{CE} = 10 Vdc, I_C = 1.0 mAdc) (V_{CE} = 10 Vdc, I_C = 10 mAdc)(1) (V_{CE} = 10 Vdc, I_C = 150 mAdc)(1) (V_{CE} = 10 Vdc, I_C = 500 mAdc)(1) (V_{CE} = 10 Vdc, I_C = 1.0 mAdc, T_A = −55°C)	h_{FE}	 50 75 100 100 30 35	 — 325 — 300 — —	—
Collector-Emitter Saturation Voltage (I_C = 150 mAdc, I_B = 15 mAdc) (I_C = 500 mAdc, I_B = 50 mAdc)	$V_{CE(sat)}$	 — —	 0.3 1.0	Vdc
Base-Emitter Saturation Voltage (I_C = 150 mAdc, I_B = 15 mAdc) (I_C = 500 mAdc, I_B = 50 mAdc)	$V_{BE(sat)}$	 0.6 —	 1.2 2.0	Vdc
DYNAMIC CHARACTERISTICS				
Small-Signal Current Gain (V_{CE} = 10 Vdc, I_C = 1.0 mAdc, f = 1.0 kHz)	h_{fe}	50	—	—
Small-Signal Current Transfer Ratio, Magnitude (V_{CE} = 10 Vdc, I_C = 20 mAdc, f = 100 MHz)	$\|h_{fe}\|$	2.5	8.0	—
Output Capacitance (V_{CB} = 10 Vdc, f = 0.1 to 1.0 MHz)	C_{obo}	—	8.0	pF
Input Capacitance (V_{BE} = 0.5 Vdc, f = 0.1 to 1.0 MHz)	C_{ibo}	—	25	pF
SWITCHING CHARACTERISTICS				
Turn-On Time (per 12MRB44836B)	t_{on}	—	35	ns
Turn-Off Time (per 12MRB44836B)	t_{off}	—	300	ns
Transistor to Transistor Resistance ($\|V_{TT}\|$ = 500 Vdc)	$\|R_{TT}\|$	10^{10}	—	ohms

ASSURANCE TESTING (Pre/Post Burn-In)
Burn-In Conditions: T_A = 25 ±3°C, V_{CB} = 30 Vdc
P_T = 1.5 W 2N6989, 0.5 W 2N6990

		Initial and End Point Limits		
Characteristics Tested	**Symbol**	**Min**	**Max**	**Unit**
Collector Cutoff Current (V_{CB} = 60 Vdc)	I_{CBO}	—	10	nAdc
DC Current Gain(1) (V_{CE} = 10 Vdc, I_C = 150 nAdc)	h_{FE}	100	300	—

Delta from Pre-Burn-In Measured Values		**Min**	**Max**	
Delta Collector Cutoff Current	ΔI_{CBO}	—	±100 or ±5.0 whichever is greater	% of Initial Value nAdc
Delta DC Current Gain(1)	Δh_{FE}	—	±15	% of Initial Value

(1) Pulsed: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.