

2N6987
2N6988

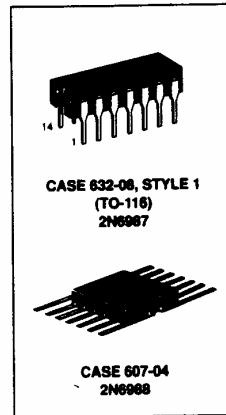
**Multiple (Quad)
PNP Silicon
Small-Signal Transistors**

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

... designed for general-purpose switching circuits and DC to VHF amplifier applications.
Similar to 2N2907A individual transistor specifications. Complementary devices available
(2N6989/90).

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MAXIMUM RATINGS			
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	60	V _{dc}
Collector-Base Voltage	V _{CBO}	60	V _{dc}
Emitter-Base Voltage	V _{EBO}	-5.0	V _{dc}
Collector Current	I _C	600	mAdc
Device Dissipation @ T _A = 25°C	P _T	1.5	Watts
		0.4	W/°C
Derate above 25°C		8.57	
		2.286	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-65 to 200	°C



ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise noted.)					
Characteristic	Symbol	Min	Max	Unit	
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ⁽¹⁾ (I _C = 10 mAdc)	V _{(BR)CEO}	60	—	V _{dc}	
Collector-Base Breakdown Voltage (I _C = 10 μAdc)	V _{(BR)CBO}	60	—	V _{dc}	
Emitter-Base Breakdown Voltage (I _E = 10 μAdc)	V _{(BR)EBO}	5.0	—	V _{dc}	
Collector Cutoff Current (V _{CB} = 50 Vdc)	I _{CBO}	—	10	nAdc	
(V _{CB} = 50 Vdc, T _A = 150°C)		—	10	μAdc	
Emitter-Cutoff Current (V _{EB} = 3.5 Vdc)	I _{EB(c)}	—	50	nAdc	

(1) Pulsed. PW 250 to 350 μs. Duty Cycle 1.0 to 2.0%

(continued)

ELECTRICAL CHARACTERISTICS — continued ($T_A = 25^\circ\text{C}$ unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain ($V_{CE} = 10\text{ Vdc}$, $I_C = 0.1\text{ mAdc}$) ($V_{CE} = 10\text{ Vdc}$, $I_C = 1.0\text{ mAdc}$) ($V_{CE} = 10\text{ Vdc}$, $I_C = 10\text{ mAdc}$) ⁽¹⁾ ($V_{CE} = 10\text{ Vdc}$, $I_C = 150\text{ mAdc}$) ⁽¹⁾ ($V_{CE} = 10\text{ Vdc}$, $I_C = 500\text{ mAdc}$) ⁽¹⁾ ($V_{CE} = 10\text{ Vdc}$, $I_C = 1.0\text{ mAdc}$, $T_A = -55^\circ\text{C}$)	h_{FE}	75 100 100 100 50 50	— 450 — 300 — —	—
Collector-Emitter Saturation Voltage ⁽¹⁾ ($I_C = 150\text{ mAdc}$, $I_B = 15\text{ mAdc}$) ($I_C = 500\text{ mAdc}$, $I_B = 50\text{ mAdc}$)	$V_{CE(sat)}$	— —	0.4 1.6	Vdc
Base-Emitter Saturation Voltage ⁽¹⁾ ($I_C = 150\text{ mAdc}$, $I_B = 15\text{ mAdc}$) ($I_C = 500\text{ mAdc}$, $I_B = 50\text{ mAdc}$)	$V_{BE(sat)}$	— —	1.3 2.6	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $f = 0.1$ to 1.0 MHz)	C_{obo}	—	8.0	pF
Input Capacitance ($V_{EB} = 2.0\text{ Vdc}$, $f = 0.1$ to 1.0 MHz)	C_{ibo}	—	30	pF
Current Transfer Ratio ($V_{CE} = 10\text{ Vdc}$, $I_C = 1.0\text{ mAdc}$, $f = 1.0\text{ kHz}$)	h_{fe}	100	—	—
Small-Signal Current Transfer Ratio, Magnitude ($V_{CE} = 20\text{ Vdc}$, $I_C = 50\text{ mAdc}$, $f = 100\text{ MHz}$)	$ h_{fe} $	2.0	8.0	—
Transistor-to-Transistor Resistance ($I_{T-T} = 500\text{ Vdc}$)	$ R_{T-T} $	10^{10}	—	ohms
SWITCHING CHARACTERISTICS (See Figure 31)				
Turn-On Time	t_{on}	—	45	ns
Turn-Off Time	t_{off}	—	300	ns

ASSURANCE TESTING (Pre/Post Burn-In)

Burn-In Conditions: $T_A = 25 \pm 3^\circ\text{C}$, $V_{CB} = 30\text{ Vdc}$

$P_T = 1.5\text{ W 2N6987}$, 0.4 W 2N6988

Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current ($V_{CB} = 50\text{ Vdc}$)	I_{CBO}	—	10	nAdc
DC Current Gain ⁽¹⁾ ($V_{CE} = 10\text{ Vdc}$, $I_C = 150\text{ nAdc}$)	h_{FE}	100	300	—
Delta from Pre-Burn-In Measured Values				
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 250 to 350 μs , Duty Cycle 1.0 to 2.0%