2N4937 thru 2N4942

2N4937, 2N4938, 2N4939
CASE 654-07, STYLE 1
2N4440, 2N4441, 2N4442
CASE 610A-04, STYLE 1

DUAL AMPLIFIER TRANSISTOR

PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	Value		Unit
Collector-Emitter Voltage	V_{CEO}	40		Vdc
Collector 1 to Collector 2 Voltage Voltage Rating and Lead to Case	V_{C1C2}	±200 ±200		Vdc
Collector-Base Voltage	V_{CBO}	50		Vdc
Emitter-Base Voltage	V_{EBO}	5.0		Vdc
Base Current	I_B	10		mAdc
Collector Current — Continuous	I_C	50		mAdc
		One Die	Both Die	
Total Device Dissipation @ T_A = 25°C — Ceramic Metal Can Derate above 25°C — Ceramic Metal Can	P_D	 250 500 1.5 2.9	 350 600 2.0 3.4	 mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C Metal Can	P_D	 1.2 6.85	 2.0 11.42	 Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C

Refer to MD3250,A for graphs.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0)	$V_{(BR)CEO}$	40	—	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	$V_{(BR)CBO}$	50	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current (V_{CB} = 40 Vdc, I_E = 0)	I_{CBO}	—	20	nAdc
Emitter Cutoff Current (V_{BE} = 3.0 Vdc, I_C = 0)	I_{EBO}	—	20	nAdc
ON CHARACTERISTICS				
DC Current Gain (I_C = 100 μAdc, V_{CE} = 10 Vdc) (I_C = 1.0 mAdc, V_{CE} = 10 Vdc) (I_C = 10 mAdc, V_{CE} = 10 Vdc)	h_{FE}	 40 50 50	 200 250 250	—
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain — Bandwidth Product (I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 100 Mhz)	f_T	300	900	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 140 kHz) Emitter Guarded	C_{cb}	—	5.0	pF
Input Impedance (I_{BE} = 0.5 Vdc, I_C = 0, f = 140 kHz) Collector Guarded	C_{eb}	—	10	pF
Input Impedance (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{ie}	1.0	10	kΩ
Voltage Feedback Ratio (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{re}	—	10	X 10^{-4}
Small-Signal Current Gain (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{fe}	50	—	—
Output Admittance (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{oe}	5.0	50	μmhos
Noise Figure (I_C = 100 μAdc, V_{CE} = 10 Vdc, R_S = 3.0 kΩ, f = 10 Hz to 15.7 kHz)	NF	—	4.0	dB

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
MATCHING CHARACTERISTICS					
DC Current Gain Ratio(1) (I_C = 100 μAdc to 1.0 mAdc, V_{CE} = 10 Vdc)	2N4937, 2N4941 2N4938, 2N4940	h_{FE1}/h_{FE2}	0.9 0.8	1.0 1.0	—
(I_C = 100 μAdc to 1.0 mAdc, V_{CE} = 10 Vdc, T_A = −55°C to 125°C)	2N4937, 2N4941 2N4938, 2N4940		0.85 0.7	1.0 1.0	
Base-Emitter Voltage Differential (I_C = 100 μAdc to 1.0 mAdc, V_{CE} = 10 Vdc)	2N4937, 2N4941 2N4938, 2N4940	$\lvert V_{BE1}-V_{BE2}\rvert$	— —	3.0 5.0	mVdc
Base-Emitter Voltage Differential Gradient (I_C = 100 μAdc to 1.0 mAdc, V_{CE} = 10 Vdc, T_A = 25°C to +125°C)	2N4937, 2N4941 2N4938, 2N4940	$\frac{\Delta(V_{BE1}-V_{BE2})}{\Delta T_A}$	— —	1.0 2.0	mVdc
(I_C = 100 μAdc to 1.0 mAdc, V_{CE} = 10 Vdc, T_A = −55°C to 25°C)	2N4937, 2N4941 2N4938, 2N4940		— —	0.8 1.6	

(1) The lowest h_{FE} reading is taken as h_{FE1} for this ratio.