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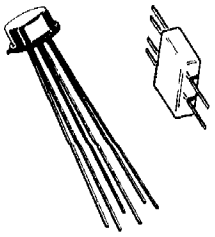
MD3250, A, F, AF
MD3251, A, F, AF

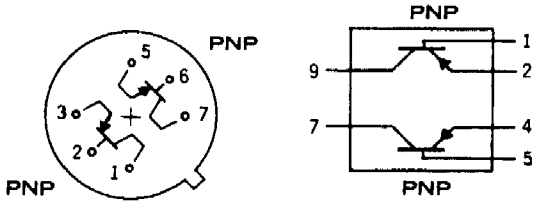
$V_{CEO} = 40V$
$I_C = 50$ mA



CASE 33
(TO-89)

CASE 32

Dual PNP silicon annular transistors, especially designed for low-level, differential amplifier applications.



PIN CONNECTIONS
(BOTTOM VIEW)

MD3250F, AF
MD3251F, AF

MAXIMUM RATINGS (each side) ($T_A = 25°C$ unless otherwise noted)

Rating	Symbol	Value		Unit
Collector-Base Voltage	V_{CB}	50		Vdc
Collector-Emitter Voltage	V_{CEO}	40		Vdc
Emitter-Base Voltage	V_{EB}	5		Vdc
DC Collector Current	I_C	50		mAdc
Junction Temperature	T_J	+200		°C
Storage Temperature Range	T_{stg}	-65 to +200		°C
		One Side	Both Sides	
Total Device Dissipation @ $T_A = 25°C$ TO-5 Case Derate above 25°C Flat Pack Derate above 25°C	P_D	 500 2.9 250 1.5	 600 3.4 350 2.0	 mW mW/°C mW mW/°C
Total Device Dissipation @ $T_C = 25°C$ TO-5 Case Derate above 25°C	P_D	 1.2 6.85	 2.0 11.42	 mW mW/°C

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors

MD3250, A, F, AF and MD3251, A, F, AF (continued)

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)		BV_{CBO}	50	—	—	Vdc
Collector-Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0)		BV_{CEO}	40	70	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		BV_{EBO}	5	—	—	Vdc
Collector Cutoff Current (V_{CB} = 50 Vdc, I_E = 0)		I_{CBO}	—	—	0.01	μAdc
(V_{CB} = 50 Vdc, I_E = 0, T_A = 150°C)			—	—	10	
Emitter Cutoff Current (V_{EB} = 3 Vdc, I_C = 0)		I_{EBO}	—	—	20	nAdc
ON CHARACTERISTICS						
DC Forward Current Transfer Ratio* (I_C = 10 μAdc, V_{CE} = 5 Vdc)	MD3250, MD3250A	h_{FE}*	25	—	—	—
	MD3251, MD3251A		50	—	—	
(I_C = 100 μAdc, V_{CE} = 5 Vdc)	MD3250, MD3250A		50	—	150	
	MD3251, MD3251A		100	—	300	
(I_C = 100 μAdc, V_{CE} = 5 Vdc, T_A = -55°C)	MD3250, MD3250A		25	—	—	
	MD3251, MD3251A		50	—	—	
(I_C = 1 mAdc, V_{CE} = 5 Vdc)	MD3250, MD3250A		50	—	150	
	MD3251, MD3251A		100	—	300	
(I_C = 10 mAdc, V_{CE} = 5 Vdc)	MD3250, MD3250A		50	—	—	
	MD3251, MD3251A		100	—	—	
(I_C = 50 mAdc, V_{CE} = 5 Vdc)	MD3250, MD3250A		15	—	—	
	MD3251, MD3251A		30	—	—	
Collector-Emitter Saturation Voltage* (I_C = 10 mAdc, I_B = 1.0 mAdc)		$V_{CE(sat)}$*	—	—	0.25	Vdc
(I_C = 50 mAdc, I_B = 5 mAdc)			—	—	0.50	
Base-Emitter Saturation Voltage* (I_C = 10 mAdc, I_B = 1.0 mAdc)		$V_{BE(sat)}$*	0.6	—	0.9	Vdc
(I_C = 50 mAdc, I_B = 5 mAdc)			—	—	1.2	
SMALL SIGNAL CHARACTERISTICS						
Current-Gain — Bandwidth Product (I_C = 10 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)	MD3250, MD3250A	f_T	200	—	—	MHz
	MD3251, MD3251A		250	—	—	
Output Capacitance (V_{CB} = 5 Vdc, I_E = 0, f = 100 kHz)		C_{ob}	—	—	6	pF
Input Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 100 kHz)		C_{ib}	—	—	8	pF
Small Signal Current Gain (I_C = 1.0 mA, V_{CE} = 10 V, f = 1 kHz)	MD3250, MD3250A	h_{fe}	50	—	200	—
	MD3251, MD3251A		100	—	400	
Voltage Feedback Ratio (I_C = 1.0 mA, V_{CE} = 10 V, f = 1 kHz)	MD3250, MD3250A	h_{re}	—	—	10	X10-4
	MD3251, MD3251A		—	—	20	
Input Impedance (I_C = 1.0 mA, V_{CE} = 10 V, f = 1 kHz)	MD3250, MD3250A	h_{ie}	1	—	6	kohms
	MD3251, MD3251A		2	—	12	
Output Admittance (I_C = 1.0 mA, V_{CE} = 10 V, f = 1 kHz)	MD3250, MD3250A	h_{oe}	4	—	40	μmhos
	MD3251, MD3251A		10	—	60	
Wide Band Noise Figure (I_C = 100 μA, V_{CE} = 10 V, R_g = 3 kohm, Noise Bandwidth 10 cps to 15.7 kHz)	MD3250, MD3250A	NF	—	—	4	dB
	MD3251, MD3251A		—	—	3	
MATCHING CHARACTERISTICS (Types MD3250A and MD3251A only)						
DC Current Gain Ratio** (I_C = 100 μAdc and 1 mAdc, V_{CE} = 5 Vdc)	MD3250A, MD3251A	h_{FE1}/h_{FE2}**	0.9	—	1.0	—
Base Voltage Differential (I_C = 10 μA, to 10 mA, V_{CE} = 5 Vdc)	MD3250A, MD3251A	$\lvert V_{BE1}-V_{BE2}\rvert$	—	—	5	mVdc
(I_C = 100 μAdc, V_{CE} = 5 Vdc)	MD3250A, MD3251A		—	—	3	
Base Voltage Differential Change (I_C = 100 μAdc, V_{CE} = 5 Vdc, T_A = -55 to +25°C)	MD3250A, MD3251A	$\Delta(V_{BE1}-V_{BE2})$	—	—	0.8	mVdc
(I_C = 100 μAdc, V_{CE} = 5 Vdc, T_A = 25 to 125°C)	MD3250A, MD3251A		—	—	1.0	

*Pulse Test ≤ 300 μs, duty cycle ≤ 2%

** The lowest h_{FE} reading is taken as h_{FE1} for this ratio