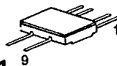
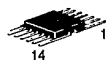


MAXIMUM RATINGS

Rating	Symbol	Value	Unit	
Collector-Emitter Voltage	V _{CEO}	40	Vdc	
Collector-Base Voltage	V _{CBO}	50	Vdc	
Emitter-Base Voltage	V _{EBO}	5.0	Vdc	
Collector Current — Continuous	I _C	50	mAdc	
		One Die	All Die Equal Power	
Total Device Dissipation @ T _A = 25°C MD3250,A, MD3251,A MD3250,AF, MD3251F,AF MQ3251	P _D	575	625	mW
		350	400	
		400	600	
		Derate above 25°C		
MD3250,A, MD3251,A MD3250,AF, MD3251F,AF MQ3251	P _D	3.29	3.57	mW/°C
		2.0	2.28	
		2.28	3.42	
		Derate above 25°C		
MD3250,A, MD3251,A MD3250,AF, MD3251F,AF MQ3251	P _D	1.8	2.5	Watts
		1.0	2.0	
		0.9	3.6	
		Derate above 25°C		
MD3250,A, MD3251,A MD3250,AF, MD3251F,AF MQ3251	P _D	10.3	14.3	mW/°C
		5.71	11.4	
		5.13	20.5	
		Derate above 25°C		
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65 to +200		°C

**MD3250,A,AF
MD3251,A,F,AF
MQ3251**
**MD3250,A
MD3251,A
CASE 654-07, STYLE 1**

**MD3250,AF
MD3251F,AF
CASE 610A-04, STYLE 1**

**MQ3251
CASE 607-04, STYLE 1**

**DUAL
AMPLIFIER TRANSISTOR
PNP SILICON**
THERMAL CHARACTERISTICS

Characteristic	Symbol	One Die	All Die Equal Power	Unit	
Thermal Resistance, Junction to Case	R _{θJC}	97	70	°C/W	
		175	87.5		
		195	48.8		
Thermal Resistance, Junction to Ambient	R _{θJA} (1)	304	280	°C/W	
		500	438		
		438	292		
Coupling Factors		Junction to Ambient	Junction to Case	%	
		MD3250,A, MD3251,A	84		44
		MD3250,AF, MD3251F,AF	75		0
		MQ3251 (Q1-Q2) (Q1-Q3 or Q1-Q4)	57		0
		55	0		

 (1) R_{θJA} is measured with the device soldered into a typical printed circuit board.

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(2) (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) (V _{CB} = 40 Vdc, I _E = 0, T _A = 150°C)	I _{CBO}	—	—	10	nAdc
		—	—	10	μAdc
Emitter Cutoff Current (V _{BE} = 3.0 Vdc, I _C = 0)	I _{EBO}	—	—	10	nAdc

MD3250,A,AF, MD3251,A,F,AF, MQ3251
ELECTRICAL CHARACTERISTICS (continued) ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS(2)					
DC Current Gain ($I_C = 10 \mu\text{Adc}$, $V_{CE} = 5.0 \text{ Vdc}$)	MD3250,A,AF MD3251,A,F,AF	25 50	75 100	— —	—
($I_C = 100 \mu\text{Adc}$, $V_{CE} = 5.0 \text{ Vdc}$)	MD3250,A,AF MD3251,A,F,AF MQ3251	50 80 80	82 170 170	150 300 —	—
($I_C = 100 \mu\text{Adc}$, $V_{CE} = 5.0 \text{ Vdc}$, $T_A = -55^\circ\text{C}$)	MD3250,A,AF MD3251,A,F,AF	25 50	35 75	— —	—
($I_C = 1.0 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$)	MD3250,A,AF MD3251,A,F,AF MQ3251	50 100 100	87 180 180	150 300 —	—
($I_C = 10 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$)	MD3250,A,AF MD3251,A,F,AF MQ3251	50 100 100	92 190 190	— — 300	—
($I_C = 50 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$)	MD3250,A,AF MD3251,A,F,AF MQ3251	15 30 30	50 90 90	— — —	—
Collector-Emitter Saturation Voltage ($I_C = 10 \text{ mAdc}$, $I_B = 1.0 \text{ mAdc}$) ($I_C = 50 \text{ mAdc}$, $I_B = 5.0 \text{ mAdc}$)		$V_{CE(sat)}$ — —	— 0.11 0.18	0.25 0.5	Vdc
Base-Emitter Saturation Voltage ($I_C = 10 \text{ mAdc}$, $I_B = 1.0 \text{ mAdc}$) ($I_C = 50 \text{ mAdc}$, $I_B = 5.0 \text{ mAdc}$)		$V_{BE(sat)}$ 0.6 —	0.78 0.88	0.9 1.2	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product ($I_C = 10 \text{ mAdc}$, $V_{CE} = 20 \text{ Vdc}$, $f = 100 \text{ MHz}$)	MD3250,A,AF MD3251,A,F,AF MQ3251	f_T 200 250 300	600 600 600	— — —	MHz
Output Capacitance ($V_{CB} = 5.0 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$)		C_{obo}	—	2.5 6.0	pF
Input Capacitance ($V_{BE} = 1.0 \text{ Vdc}$, $I_C = 0$, $f = 100 \text{ kHz}$)		C_{ibo}	—	6.0 8.0	pF

MATCHING CHARACTERISTICS (MD3250,A,AF & MD3251,A,F,AF ONLY)

DC Current Gain Ratio(3) ($I_C = 100 \mu\text{Adc}$, $V_{CE} = 5.0 \text{ Vdc}$) ($I_C = 1.0 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$)		h_{FE1}/h_{FE2} 0.9 0.9	— —	1.0 1.0	—
Base-Emitter Voltage Differential ($I_C = 100 \mu\text{Adc}$, $V_{CE} = 5.0 \text{ Vdc}$) ($I_C = 10 \mu\text{Adc}$, $V_{CE} = 5.0 \text{ Vdc}$) ($I_C = 10 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$)		$ V_{BE1} - V_{BE2} $ — — —	— — —	3.0 5.0 5.0	mVdc
Base-Emitter Voltage Differential Change Due to Temperature ($I_C = 100 \mu\text{Adc}$, $V_{CE} = 5.0 \text{ Vdc}$, $T_A = -55$ to $+25^\circ\text{C}$) ($I_C = 100 \mu\text{Adc}$, $V_{CE} = 5.0 \text{ Vdc}$, $T_A = +25$ to $+125^\circ\text{C}$)		$\Delta V_{BE1} - V_{BE2} $ — —	— —	0.8 1.0	mVdc

 (2) Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

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

FIGURE 1 - CAPACITANCE

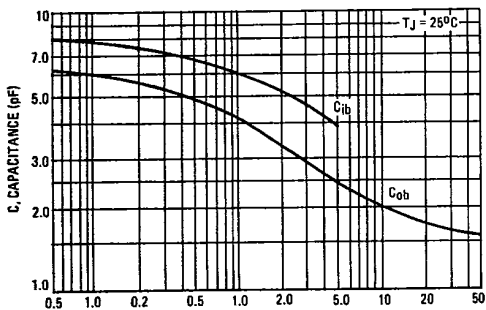
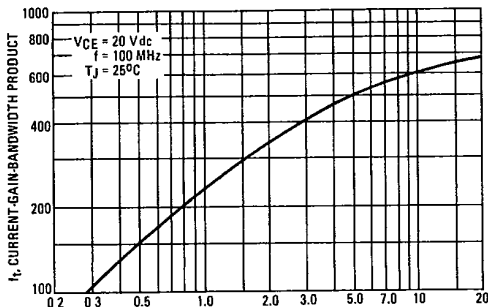


FIGURE 2 - CURRENT-GAIN BANDWIDTH PRODUCT



NOISE FIGURE VARIATIONS

($V_{CE} = 6.0\text{ V}$, $T_A = 25^\circ\text{C}$)

FIGURE 3 - EFFECTS OF FREQUENCY

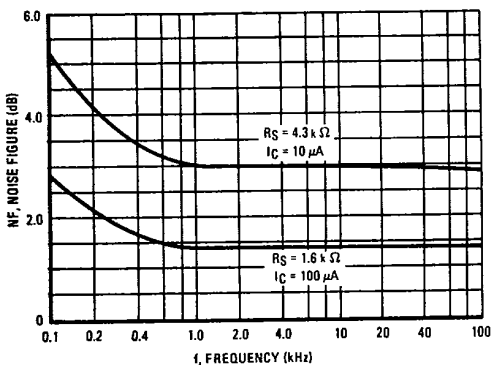


FIGURE 4 - EFFECTS OF SOURCE RESISTANCE

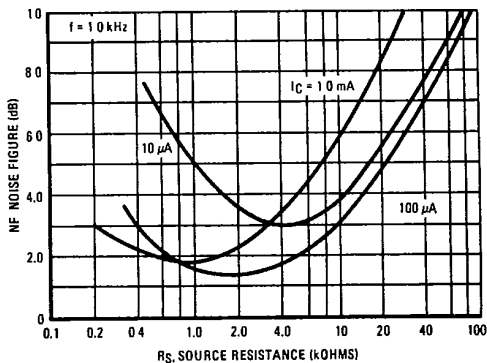
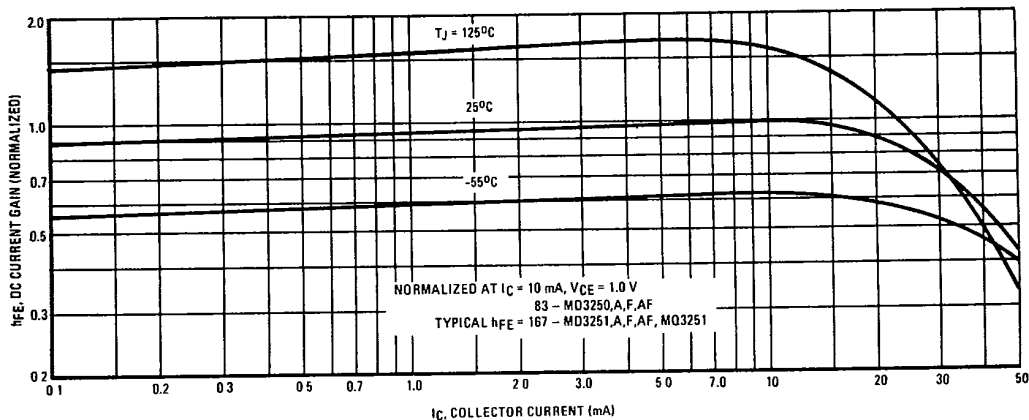


FIGURE 5 - DC CURRENT GAIN



MAXIMUM RATINGS

Rating	Symbol	Value		Unit			
Collector-Emitter Voltage	V _{CEO}	40		Vdc			
Collector-Base Voltage	V _{CBO}	50		Vdc			
Emitter-Base Voltage	V _{EBO}	5.0		Vdc			
Collector Current — Continuous	I _C	50		mAdc			
		One Die	All Die Equal Power				
Total Device Dissipation @ T _A = 25°C MD7003,A,B MD7003,AF MQ7003	P _D	550	600	mW			
		350	400				
		400	600				
Derate above 25°C MD7003,A,B MD7003,AF MQ7003	P _D	3.14	3.42	mW/°C			
		2.0	2.28				
		2.28	3.42				
Total Device Dissipation @ T _C = 25°C MD7003,A,B MD7003,AF MQ7003	P _D	1.4	2.0	Watts			
		0.7	1.4				
		0.7	2.8				
		Derate above 25°C MD7003,A,B MD7003,AF MQ7003	P _D		8.0	11.4	mW/°C
					4.0	8.0	
4.0	16						
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65 to +200		°C			

**MD7003,A,B,AF
MQ7003**
**MD7003,A,B
CASE 654-07, STYLE 1**

**MD7003,AF
CASE 610A-04, STYLE 1**

**MQ7003
CASE 607-04, STYLE 1**

**DUAL
AMPLIFIER TRANSISTOR**
PNP SILICON

Refer to 2N3810 for curves.

THERMAL CHARACTERISTICS

Characteristic	Symbol	One Die	All Die Equal Power	Unit
Thermal Resistance, Junction to Case	R _{θJC}	MD7003,A,B	125	87.5
		MD7003,AF	250	125
		MQ7003	250	82.6
Thermal Resistance, Junction to Ambient	R _{θJA} (1)	MD7003,A,B	319	292
		MD7003,AF	500	438
		MQ7003	438	292
Coupling Factor		Junction to Ambient		Junction to Case
		MD7003,A,B	83	40
		MD7003,AF	75	0
		MQ7003 (Q1-Q2)	57	0
		MQ7003 (Q1-Q3 or Q1-Q4)	55	0

 (1) R_{θJA} is measured with the device soldered into a typical printed circuit board.

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(2) (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} = 30 Vdc, I _E = 0)	I _{CBO}	—	—	100	nAdc
ON CHARACTERISTICS					
DC Current Gain(2) (I _C = 100 μAdc, V _{CE} = 10 Vdc) (I _C = 10 mAdc, V _{CE} = 10 Vdc)	h _{FE}	40 50	350 350	— —	—

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

Characteristic	Symbol	Min	Typ	Max	Unit
Collector-Emitter Saturation Voltage ($I_C = 10\text{ mA}$, $I_B = 1.0\text{ mA}$)	$V_{CE(sat)}$	—	0.25	0.35	Vdc
Base-Emitter Saturation Voltage ($I_C = 10\text{ mA}$, $I_B = 1.0\text{ mA}$)	$V_{BE(sat)}$	—	0.6	1.0	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product ($I_C = 5.0\text{ mA}$, $V_{CE} = 20\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	200	300	—	MHz
Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 100\text{ kHz}$)	C_{obo}	—	3.0	6.0	pF
Input Capacitance ($V_{BE} = 2.0\text{ Vdc}$, $I_C = 0$, $f = 100\text{ kHz}$)	C_{ibo}	—	2.0	8.0	pF
Noise Figure ($I_C = 100\text{ }\mu\text{A}$, $V_{CE} = 10\text{ Vdc}$, $R_S = 3.0\text{ kohms}$, $f = 10\text{ Hz}$ to 15.7 kHz)	NF	—	2.0	—	dB

MATCHING CHARACTERISTICS

DC Current Gain Ratio(3) ($I_C = 100\text{ }\mu\text{A}$, $V_{CE} = 10\text{ Vdc}$)	MD7003A,AF MD7003B	h_{FE1}/h_{FE2}	0.75 0.85	— —	1.0 1.0	—
Base-Emitter Voltage Differential ($I_C = 100\text{ }\mu\text{A}$, $V_{CE} = 10\text{ Vdc}$)	MD7003A,AF MD7003B	$ V_{BE1} - V_{BE2} $	— —	— —	25 15	mV

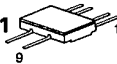
(2) Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

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

MAXIMUM RATINGS

Rating	Symbol	Value	Unit	
Collector-Emitter Voltage	V _{CEO}	40	Vdc	
Collector-Base Voltage	V _{CBO}	50	Vdc	
Emitter-Base Voltage	V _{EBO}	5.0	Vdc	
Collector Current — Continuous	I _C	200	mAdc	
		One Die	All Die Equal Power	
Total Device Dissipation @ T _A = 25°C	P _D		mW	
MD7007,A,B		575	625	
MD7007F,BF		350	400	
MQ7007		400	600	
Derate above 25°C			mW/°C	
MD7007,A,B		3.29	3.57	
MD7007F,BF		2.0	2.28	
MQ7007		2.28	3.42	
Total Device Dissipation @ T _C = 25°C	P _D		Watts	
MD7007,A,B		1.8	2.5	
MD7007F,BF		1.0	2.0	
MQ7007		0.9	3.6	
Derate above 25°C			mW/°C	
MD7007,A,B		10.3	14.3	
MD7007F,BF		5.71	11.4	
MQ7007		5.13	20.5	
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65 to +200		°C

**MD7007,A,B,F,BF
MQ7007**
**MD7007,A,B
CASE 654-07, STYLE 1**

**MD7007F,BF
CASE 610A-04, STYLE 1**

**MQ7007
CASE 607-04, STYLE 1**

**DUAL
AMPLIFIER TRANSISTOR**
PNP SILICON
THERMAL CHARACTERISTICS

Characteristic	Symbol	One Die	All Die Equal Power	Unit
Thermal Resistance, Junction to Case	R _{θJC}			°C/W
		97	70	
		175	87.5	
		195	48.8	
Thermal Resistance, Junction to Ambient	R _{θJA} (1)			°C/W
		304	280	
		500	438	
		438	292	
Coupling Factors		Junction to Ambient	Junction to Case	%
		84	44	
		75	0	
		57	0	
		55	0	

 (1) R_{θJA} is measured with the device soldered into a typical printed circuit board.

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(2) (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} = 30 Vdc, I _E = 0)	I _{CBO}	—	—	100	nAdc
ON CHARACTERISTICS(2)					
DC Current Gain	h _{FE}				
(I _C = 100 μAdc, V _{CE} = 10 Vdc)		30	110	—	—
(I _C = 1.0 mAdc, V _{CE} = 10 Vdc)		30	130	—	—
(I _C = 10 mAdc, V _{CE} = 10 Vdc)		30	75	—	—
(I _C = 50 mAdc, V _{CE} = 10 Vdc)		15	25	—	—

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

Characteristic	Symbol	Min	Typ	Max	Unit
Collector-Emitter Saturation Voltage ($I_C = 50 \text{ mAdc}$, $I_B = 5.0 \text{ mAdc}$)	$V_{CE(\text{sat})}$	—	0.38	1.0	Vdc
Base-Emitter Saturation Voltage ($I_C = 50 \text{ mAdc}$, $I_B = 5.0 \text{ mAdc}$)	$V_{BE(\text{sat})}$	—	0.9	1.5	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product(2) ($I_C = 10 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	300	600	—	MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$)	C_{obo}	—	4.0	8.0	pF
Input Capacitance ($V_{BE} = 2.0 \text{ Vdc}$, $I_C = 0$, $f = 100 \text{ kHz}$)	C_{ibo}	—	3.8	10	pF

MATCHING CHARACTERISTICS

DC Current Gain Ratio(3) ($I_C = 1.0 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$)	MD7007A MD7007B	h_{FE1}/h_{FE2}	0.75 0.85	— —	1.0 1.0	—
Base-Emitter Voltage Differential ($I_C = 1.0 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$)	MD7007A MD7007B	$ V_{BE1} - V_{BE2} $	— —	— —	20 10	mVdc

(2) Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.(3) The lowest h_{FE} reading is taken as h_{FE1} for this ratio.