

MD3762,F MQ3762

MD3762
CASE 654-07, STYLE 1

MD3762F
CASE 610A-04, STYLE 1

MQ3762
CASE 607-04, STYLE 1

DUAL
AMPLIFIER TRANSISTOR

PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	Value		Unit
Collector-Emitter Voltage	V _{CEO}	40		Vdc
Collector-Base Voltage	V _{CBO}	40		Vdc
Emitter-Base Voltage	V _{EBO}	5.0		Vdc
Collector Current — Continuous	I _C	1.5		Adc
		One Die	All Die Equal Power	
Total Device Dissipation @ T _A = 25°C	P _D			mW
MD3762		600	650	
MD3762F		350	400	
MQ3762		400	600	
Derate above 25°C				mW/°C
MD3762		3.42	3.7	
MD3762F		2.0	2.28	
MQ3762		2.28	3.42	
Total Device Dissipation @ T _C = 25°C	P _D			Watts
MD3762		2.1	3.0	
MD3762F		1.25	2.5	
MQ3762		1.0	4.0	
Derate above 25°C				mW/°C
MD3762		12	17.2	
MD3762F		7.15	14.3	
MQ3762		5.71	22.8	
Operating and Storage Junction Temperature Range	T _J , T _{stg}	- 65 to + 200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	One Die	All Die Equal Power	Unit
Thermal Resistance, Junction to Case MD3762 MD3762F MQ3762	R _{θJC}	83.3 140 175	58.3 70 43.8	°C/W
Thermal Resistance, Junction to Ambient MD3762 MD3762F MQ3762	R _{θJA} (1)	292 500 438	270 438 292	°C/W
		Junction to Ambient	Junction to Case	
Coupling Factors MD3762 MD3762F MQ3762 (Q1-Q2) (Q1-Q3, Q1-Q4)		85 75 57 55	40 0 0 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}	40	—	—	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) (V _{CB} = 30 Vdc, I _E = 0, T _A = 100°C)	I _{CBO}	—	—	100 10	nAdc μAdc
Emitter Cutoff Current (V _{BE} = 3.0 Vdc, I _C = 0)	I _{EBO}	—	—	100	nAdc

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

Characteristic	Symbol	Min	Typ	Max	Unit	
ON CHARACTERISTICS(2)						
DC Current Gain ($I_C = 1.0 \text{ Adc}$, $V_{CE} = 2.0 \text{ Vdc}$)	h_{FE}	20	40	—	—	
Collector-Emitter Saturation Voltage ($I_C = 1.0 \text{ Adc}$, $I_B = 0.1 \text{ Adc}$)	$V_{CE(sat)}$	—	0.52	1.0	Vdc	
Base-Emitter Saturation Voltage ($I_C = 1.0 \text{ Adc}$, $I_B = 0.1 \text{ Adc}$)	$V_{BE(sat)}$	—	1.05	1.4	Vdc	
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain — Bandwidth Product ($I_C = 50 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	150	220	—	MHz	
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 140 \text{ kHz}$)	C_{obo}	—	8.5	20	pF	
Input Capacitance ($V_{BE} = 0.5 \text{ Vdc}$, $I_C = 0$, $f = 140 \text{ kHz}$)	C_{ibo}	—	22	80	pF	
SWITCHING CHARACTERISTICS						
Delay Time	$(V_{CC} = 30 \text{ Vdc}$, $V_{BE(off)} = 2.0 \text{ Vdc}$, $I_C = 1.0 \text{ Adc}$, $I_{B1} = 100 \text{ mAdc}$)	t_d	—	5.0	10	ns
Rise Time		t_r	—	18	30	ns
Storage Time	$(V_{CC} = 30 \text{ Vdc}$, $I_C = 1.0 \text{ Adc}$, $I_{B1} = I_{B2} = 100 \text{ mAdc}$)	t_s	—	45	80	ns
Fall Time		t_f	—	18	30	ns

(2) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
(3) f_T is defined as the frequency at which |h_{fe}| extrapolates to unity.

FIGURE 1 – DC CURRENT GAIN

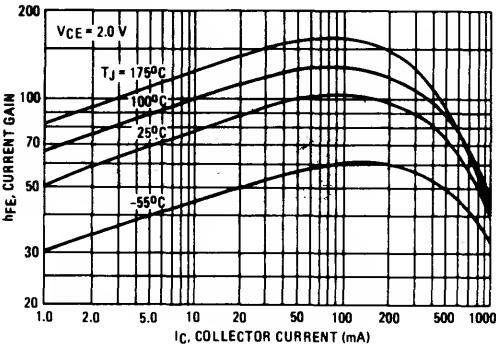


FIGURE 2 – COLLECTOR SATURATION REGION

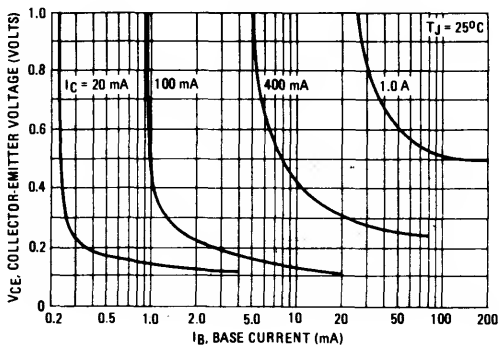


FIGURE 3 – "ON" VOLTAGE

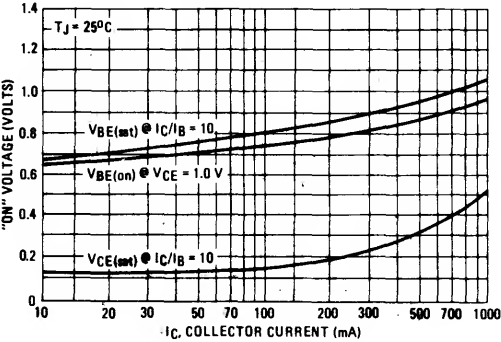


FIGURE 4 – TEMPERATURE COEFFICIENTS

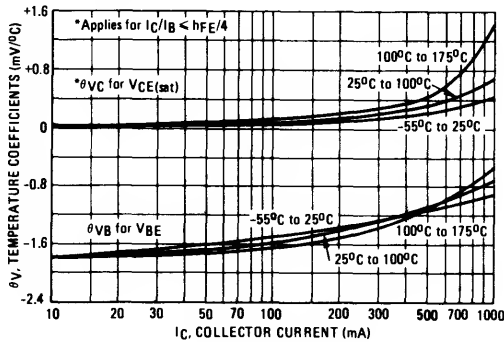


FIGURE 5 – ACTIVE REGION SAFE OPERATING AREA

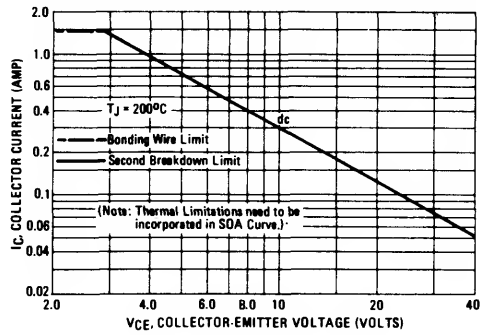


FIGURE 6 – TURN-ON TIME

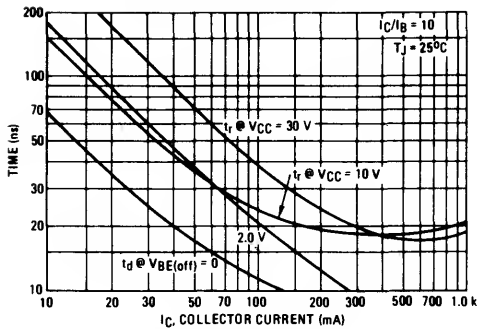


FIGURE 7 – RISE AND FALL TIME

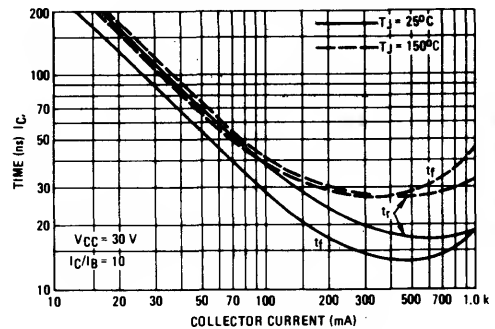


FIGURE 8 – STORAGE TIME

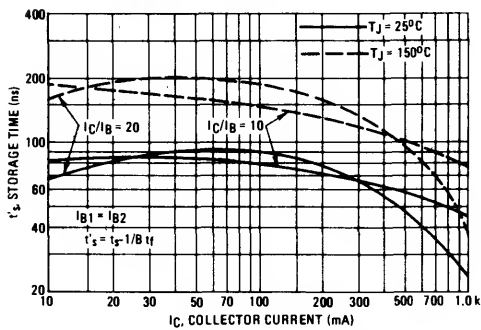


FIGURE 9 – FALL TIME

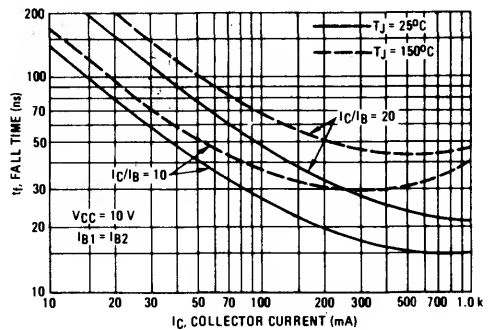


FIGURE 10 – SWITCHING TIME TEST CIRCUIT

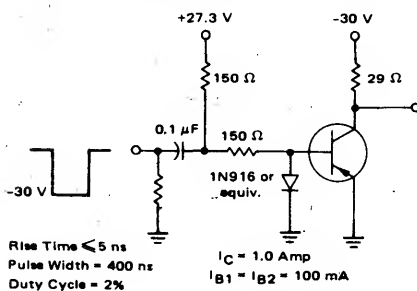


FIGURE 11 – CAPACITANCE

