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

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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	$R_{\theta JC}$			°C/W
MD3762		83.3	58.3	
MD3762F		140	70	
MQ3762		175	43.8	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$(1)			°C/W
MD3762		292	270	
MD3762F		500	438	
MQ3762		438	292	
		Junction to Ambient	Junction to Case	
Coupling Factors				%
MD3762		85	40	
MD3762F		75	0	
MQ3762 (Q1-Q2)		57	0	
(Q1-Q3, Q1-Q4)		55	0	

(1) $R_{\theta JA}$ 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	I_{CBO}				
(V_{CB} = 30 Vdc, I_E = 0)		—	—	100	nAdc
(V_{CB} = 30 Vdc, I_E = 0, T_A = 100°C)		—	—	10	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 Adc, V_{CE} = 2.0 Vdc)		h_{FE}	20	40	—	—
Collector-Emitter Saturation Voltage (I_C = 1.0 Adc, I_B = 0.1 Adc)		$V_{CE(sat)}$	—	0.52	1.0	Vdc
Base-Emitter Saturation Voltage (I_C = 1.0 Adc, I_B = 0.1 Adc)		$V_{BE(sat)}$	—	1.05	1.4	Vdc
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain — Bandwidth Product (I_C = 50 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)		f_T	150	220	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 140 kHz)		C_{obo}	—	8.5	20	pF
Input Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 140 kHz)		C_{ibo}	—	22	80	pF
SWITCHING CHARACTERISTICS						
Delay Time	(V_{CC} = 30 Vdc, $V_{BE(off)}$ = 2.0 Vdc, I_C = 1.0 Adc, I_{B1} = 100 mAdc)	t_d	—	5.0	10	ns
Rise Time		t_r	—	18	30	ns
Storage Time	(V_{CC} = 30 Vdc, I_C = 1.0 Adc, $I_{B1} = I_{B2}$ = 100 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.

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FIGURE 1 – DC CURRENT GAIN

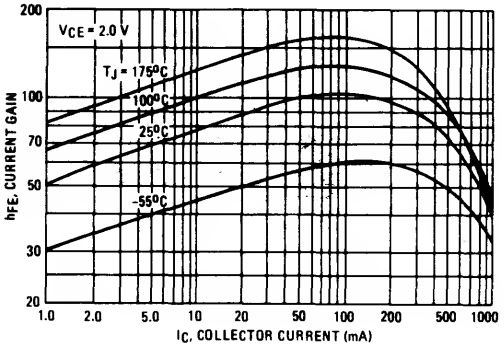

FIGURE 2 – COLLECTOR SATURATION REGION

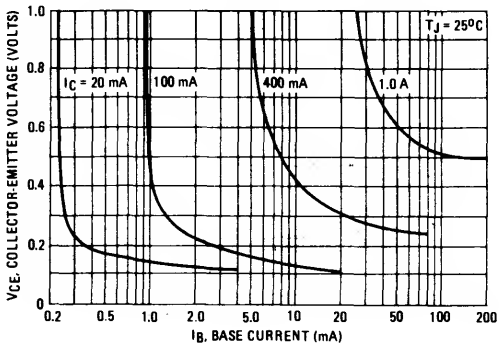

FIGURE 3 – "ON" VOLTAGE

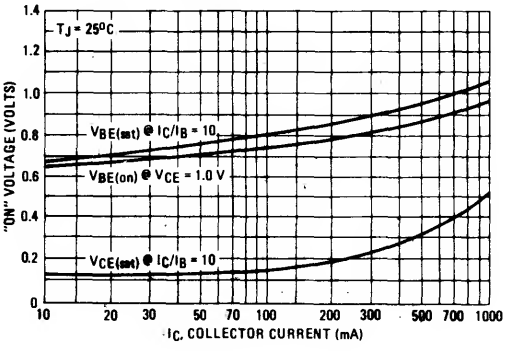

FIGURE 4 – TEMPERATURE COEFFICIENTS

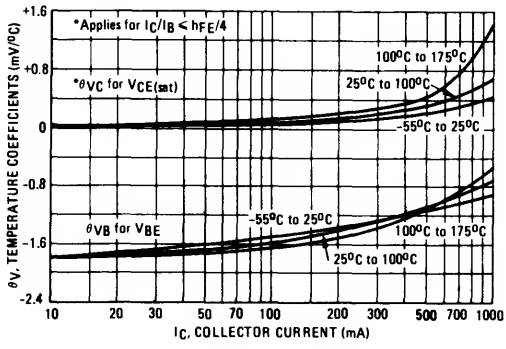

FIGURE 5 – ACTIVE REGION SAFE OPERATING AREA

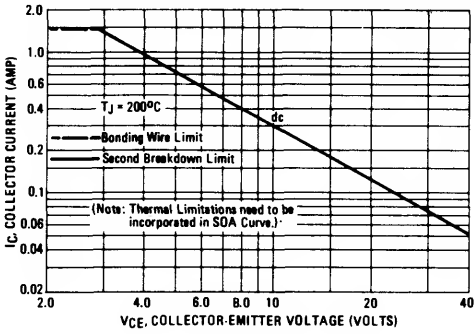

FIGURE 6 – TURN-ON TIME

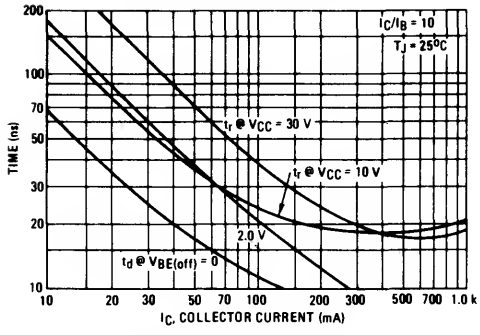

FIGURE 7 – RISE AND FALL TIME

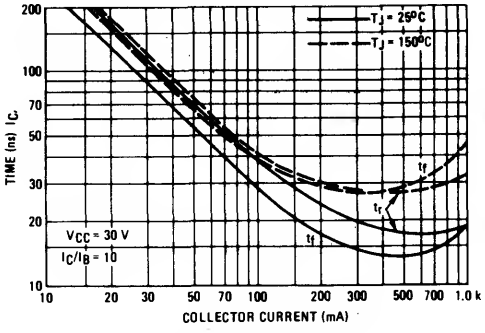

FIGURE 8 – STORAGE TIME

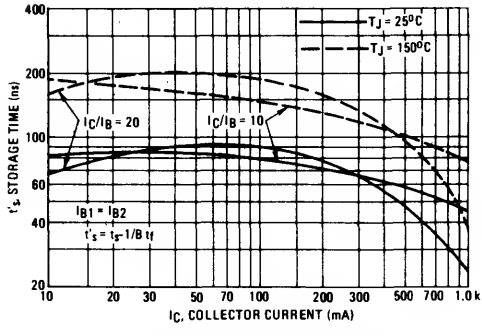

FIGURE 9 – FALL TIME

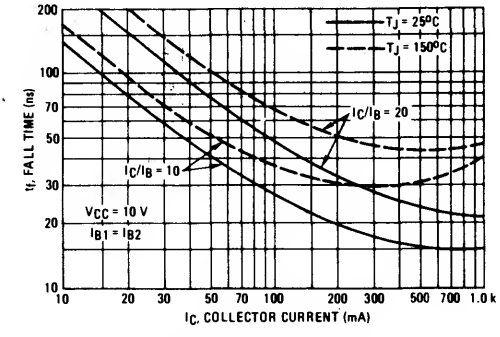

FIGURE 10 – SWITCHING TIME TEST CIRCUIT

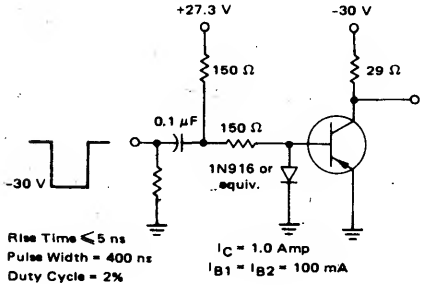

FIGURE 11 – CAPACITANCE