

MAXIMUM RATINGS

Rating	Symbol	Value		Unit
Collector-Emitter Voltage	V _{CEO}	40		Vdc
Collector-Base Voltage	V _{CBO}	65		Vdc
Emitter-Base Voltage	V _{EBO}	6.0		Vdc
Collector Current — Continuous	I _C	1.0		Adc
		One Die	All Die Equal Power	
Total Device Dissipation @ T _A = 25°C	P _D			mW
MD3725		600	650	
MD3725F		350	400	
MQ3725		400	600	
Derate above 25°C				mW/°C
MD3725		3.42	3.7	
MD3725F		2.0	2.28	
MQ3725		2.28	3.42	
Total Device Dissipation @ T _C = 25°C	P _D			Watts
MD3725		2.1	3.0	
MD3725F		1.25	2.5	
MQ3725		1.0	4.0	
Derate above 25°C				mW/°C
MD3725		12	17.2	
MD3725F		7.15	14.3	
MQ3725		5.71	22.8	
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65 to +200		°C

MD3725,F MQ3725

MD3725
CASE 654-07, STYLE 1

MD3725F
CASE 610A-04, STYLE 1

MQ3725
CASE 607-04, STYLE 1

DUAL
AMPLIFIER TRANSISTOR

NPN SILICON

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THERMAL CHARACTERISTICS

Characteristic	Symbol	One Die	All Die Equal Power	Unit
Thermal Resistance, Junction to Case	R _{θJC}			°C/W
		MD3725	83.3	58.3
		MD3725F	140	70
		MQ3725	175	43.8
Thermal Resistance, Junction to Ambient	R _{θJA} (1)			°C/W
		MD3725	292	270
		MD3725F	500	438
		MQ3725	433	292
			Junction to Ambient	Junction to Case
Coupling Factor				%
		MD3725	85	40
		MD3725F	75	0
		MQ3725 (Q1-Q2)	57	0
		(Q1-Q3, 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	T _{yp}	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(2) (I _C = 10 mAdc, I _B = 0)	V _{(BR)CEO}	40	—	—	Vdc
Collector-Emitter Breakdown Voltage (I _C = 10 μAdc, V _{BE} = 0)	V _{(BR)CES}	65	—	—	Vdc
Collector-Base Breakdown Voltage (I _C = 100 μAdc, I _E = 0)	V _{(BR)CBO}	65	—	—	Vdc
Emitter-Base Breakdown Voltage (I _E = 10 μAdc, I _C = 0)	V _{(BR)EBO}	6.0	—	—	Vdc
Collector Cutoff Current (V _{CB} = 40 Vdc, I _E = 0) (V _{CB} = 40 Vdc, I _E = 0, T _A = 100°C)	I _{CBO}	—	0.12	1.7	μAdc μAdc

MD3765,F, MQ3725

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS(2)					
DC Current Gain ($I_C = 100 \text{ mAdc}$, $V_{CE} = 1.0 \text{ Vdc}$) ($I_C = 500 \text{ mAdc}$, $V_{CE} = 2.0 \text{ Vdc}$)	h_{FE}	50 30	— —	150 —	—
Collector-Emitter Saturation Voltage ($I_C = 100 \text{ mAdc}$, $I_B = 10 \text{ mAdc}$) ($I_C = 500 \text{ mAdc}$, $I_B = 50 \text{ mAdc}$)	$V_{CE(sat)}$	— —	0.19 0.30	0.26 0.45	Vdc
Base-Emitter Saturation Voltage ($I_C = 100 \text{ mAdc}$, $I_B = 10 \text{ mAdc}$) ($I_C = 500 \text{ mAdc}$, $I_B = 50 \text{ mAdc}$)	$V_{BE(sat)}$	— 0.80	— —	0.86 1.2	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product ($I_C = 50 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	200	—	—	MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$)	C_{obo}	—	—	10	pF
Input Capacitance ($V_{BE} = 0.5 \text{ Vdc}$, $I_C = 0$, $f = 100 \text{ kHz}$)	C_{ibo}	—	—	65	pF
SWITCHING CHARACTERISTICS					
Turn-On Time ($V_{CC} = 30 \text{ Vdc}$, $I_C = 500 \text{ mAdc}$, $I_{B1} = 50 \text{ mAdc}$, $V_{BE(off)} = 3.8 \text{ Vdc}$)	t_{on}	—	20	45	ns
Turn-Off Time ($V_{CC} = 30 \text{ Vdc}$, $I_C = 500 \text{ mAdc}$, $I_{B1} = I_{B2} = 50 \text{ mAdc}$)	t_{off}	—	50	75	ns

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

TYPICAL DC CHARACTERISTICS

FIGURE 1 — DC CURRENT GAIN

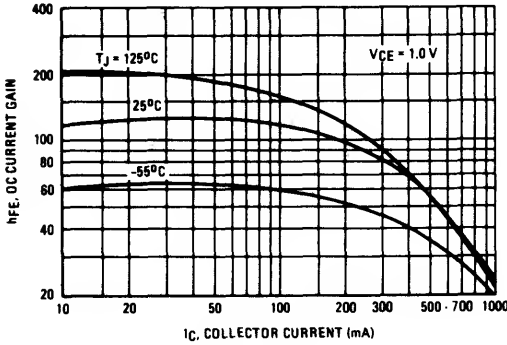


FIGURE 2 — "ON" VOLTAGES

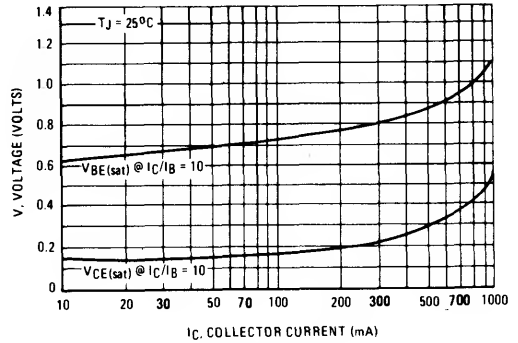


FIGURE 3 — COLLECTOR SATURATION REGION

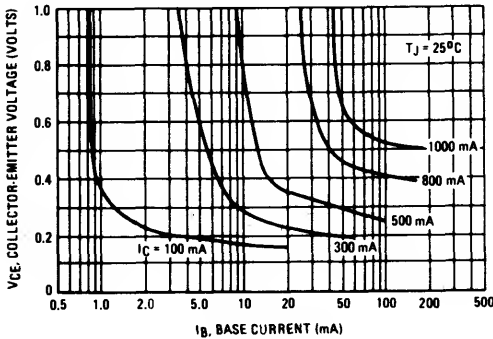
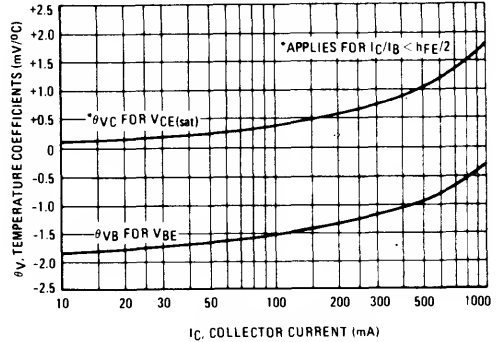


FIGURE 4 — TEMPERATURE COEFFICIENTS



TYPICAL DYNAMIC CHARACTERISTICS

FIGURE 5 - CURRENT-GAIN - BANDWIDTH PRODUCT

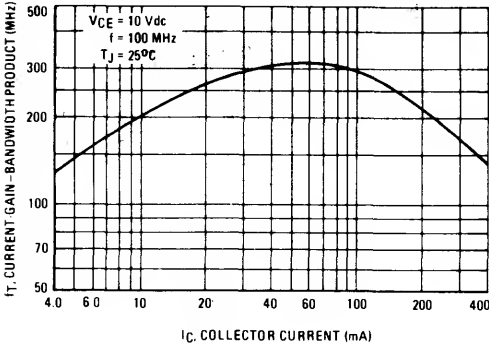


FIGURE 6 - CAPACITANCE

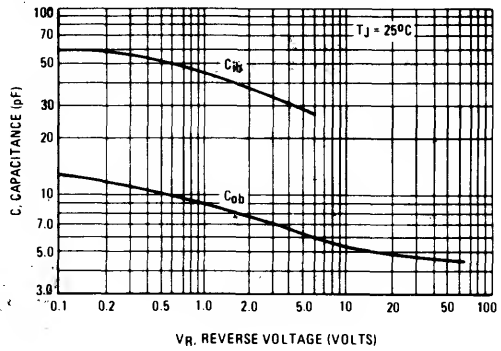


FIGURE 7 - TURN-ON TIME

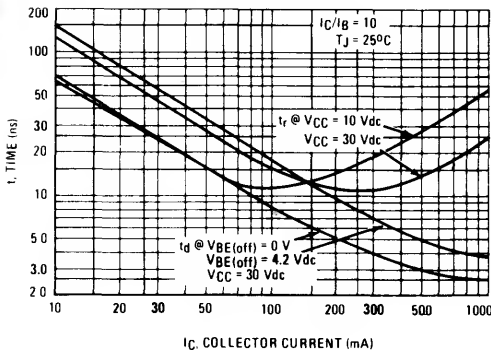


FIGURE 8 - TURN-OFF TIME

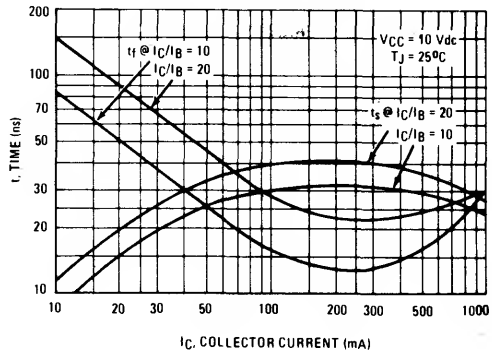


FIGURE 9 - SWITCHING TIME TEST CIRCUIT

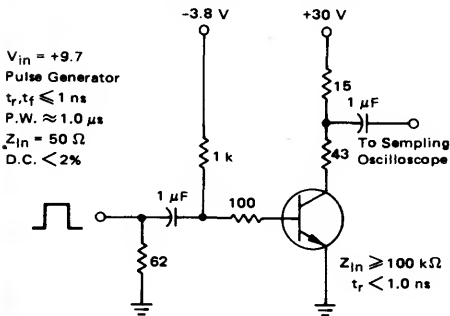


FIGURE 10 - COLLECTOR CUTOFF CURRENT

