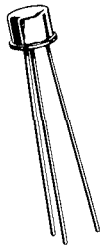
MM3724 (SILICON)
MM3725

V_{CEO} = 30 to 50 V
I_C = 1.5 A
P_D = 1 W



CASE 31
(TO-5)

NPN silicon annular transistors designed for medium-current, high-speed saturated switching and core driver applications. Type MM3725 is complementary to PNP type MM3726.

Collector connected to case

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

Rating	Symbol	MM3724	MM3725	Unit
Collector-Emitter Voltage	V_{CEO}	30	50	Vdc
Emitter-Base Voltage	V_{EB}	6		Vdc
Collector Current — Continuous	I_C	1.5		Adc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.0 5.71		Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	5.0 28.6		Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	35	°C/W
Thermal Resistance, Junction to Ambient	θ_{JA}	175	°C/W

MM3724, MM3725 (continued)

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

Characteristic	Fig. No.	Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0) MM3724 / MM3725	—	BV_{CEO}	30 / 50	— / —	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	—	BV_{EBO}	6	—	Vdc
Collector Cutoff Current (V_{CB} = 40 Vdc, I_E = 0)	—	I_{CBO}	—	0.5	μAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 500 mAdc, V_{CE} = 2 Vdc) / (I_C = 1 Adc, V_{CE} = 5 Vdc)	9	h_{FE}	25 / 15	150 / —	—
Collector-Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 50 mAdc) / (I_C = 1 Adc, I_B = 100 mAdc)	10, 11	$V_{CE(sat)}$	— / —	0.6 / 0.9	Vdc
Base-Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 50 mAdc) / (I_C = 1 Adc, I_B = 100 mAdc)	11	$V_{BE(sat)}$	0.8 / —	1.0 / 1.3	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain — Bandwidth Product (I_C = 50 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	—	f_T	200	—	MHz
Collector-Base Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz, emitter guarded)	3	C_{cb}	—	9	pF
Emitter-Base Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 100 kHz, collector guarded)	3	C_{eb}	—	80	pF
Turn-On Time (V_{CC} = 30 Vdc, $V_{EB(off)}$ = 2 Vdc, I_C = 500 mAdc, I_{B1} = 50 mAdc, R_B = 200 ohms, R_L = 60 ohms)	1, 5, 6	t_{on}	—	30	ns
Turn-Off Time (V_{CC} = 30 Vdc, I_C = 500 mAdc, I_{B1} = I_{B2} = 50 mAdc, R_B = 200 ohms, R_L = 60 ohms)	2, 6, 7, 8	t_{off}	—	50	ns
Turn-On Time (V_{CC} = 30 Vdc, $V_{EB(off)}$ = 2 Vdc, I_C = 1 Adc, I_{B1} = 100 mAdc, R_B = 100 ohms, R_L = 30 ohms)	1, 5, 6	t_{on}	—	40	ns
Turn-Off Time (V_{CC} = 30 Vdc, I_C = 1 Adc, I_{B1} = I_{B2} = 100 mAdc, R_B = 100 ohms, R_L = 30 ohms)	2, 6, 7, 8	t_{off}	—	50	ns

SWITCHING TIME EQUIVALENT TEST CIRCUITS

FIGURE 1 — TURN-ON TIME

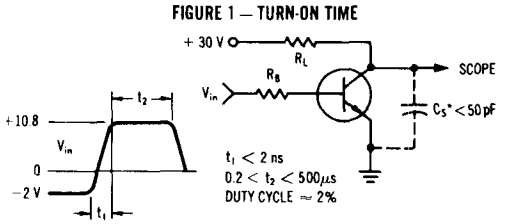
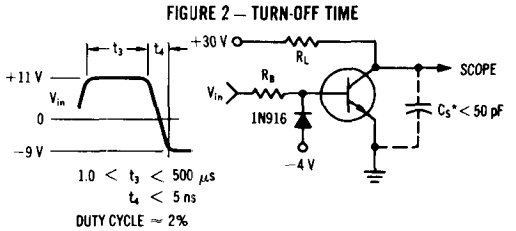


FIGURE 2 — TURN-OFF TIME



*TOTAL SHUNT CAPACITANCE OF TEST JIG, CONNECTORS, AND OSCILLOSCOPE

MM3724, MM3725 (continued)

TRANSIENT CHARACTERISTICS

—— 25°C - - - 150°C

FIGURE 3 — CAPACITANCES

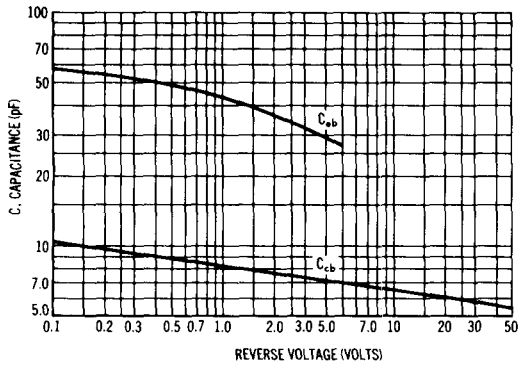


FIGURE 4 — CHARGE DATA

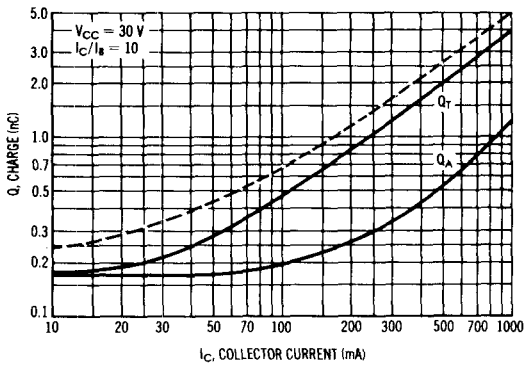


FIGURE 5 — TURN-ON TIME

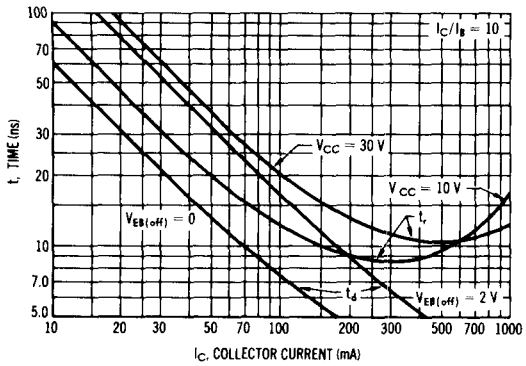


FIGURE 6 — RISE AND FALL TIMES

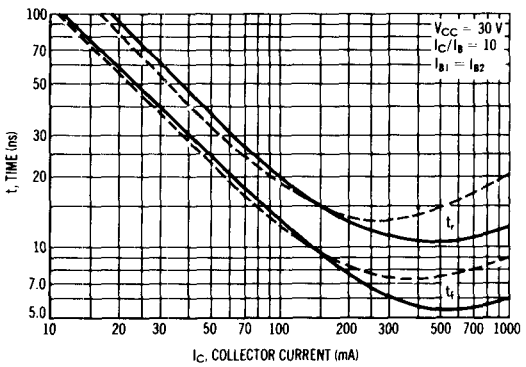


FIGURE 7 — STORAGE TIME

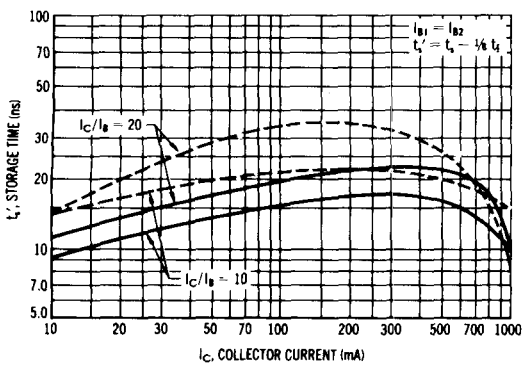
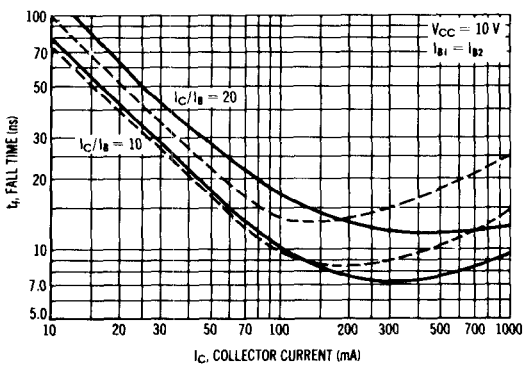


FIGURE 8 — FALL TIME



MM3724, MM3725 (continued)

STATIC CHARACTERISTICS

FIGURE 9 – CURRENT GAIN

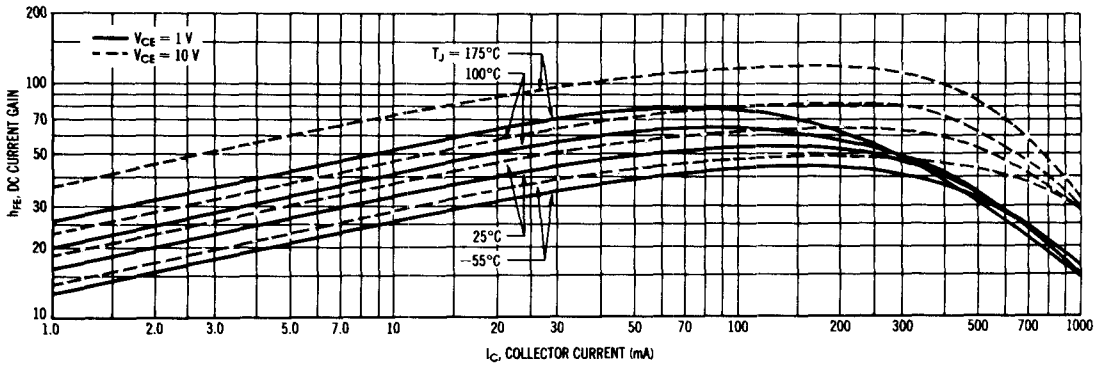


FIGURE 10 – SATURATION REGION

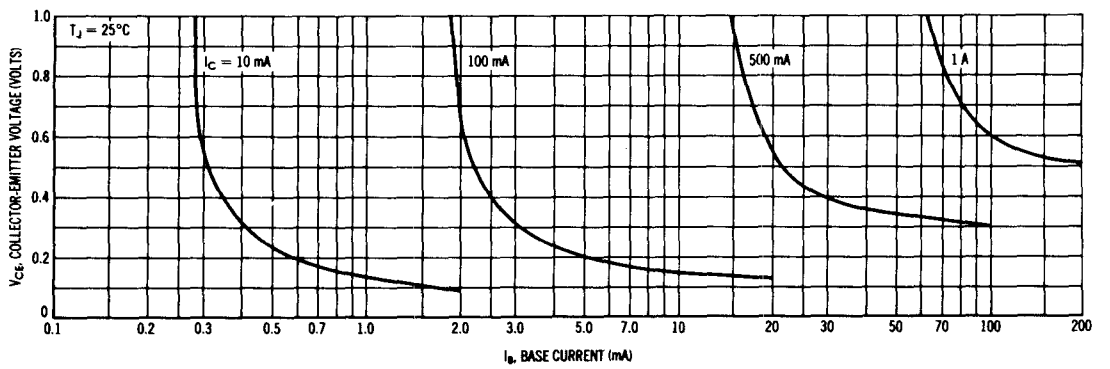


FIGURE 11 – "ON" VOLTAGES

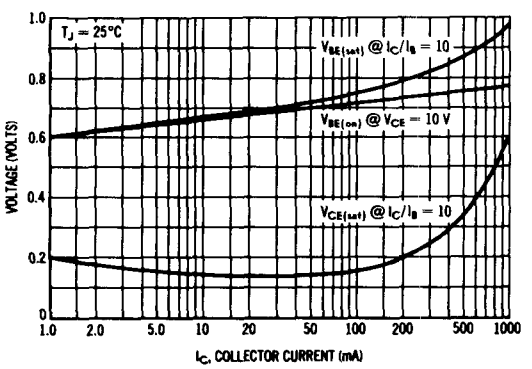


FIGURE 12 – TEMPERATURE COEFFICIENTS