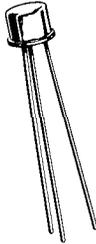


**MM3724** (SILICON)  
**MM3725**

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

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

**CASE 31**  
(TO-5)

**MAXIMUM RATINGS** ( $T_A = 25^\circ\text{C}$  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 @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0	5.71	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	5.0	28.6	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200		$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	35	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient	$\theta_{JA}$	175	$^\circ\text{C}/\text{W}$

**MM3724, MM3725** (continued)

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

Characteristic	Fig. No.	Symbol	Min	Max	Unit
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**OFF CHARACTERISTICS**

Collector-Emitter Breakdown Voltage ( $I_C = 10 \text{ mAdc}$ , $I_B = 0$ )	MM3724 MM3725	—	$BV_{CEO}$	30 50	— —	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 10 \mu\text{Adc}$ , $I_C = 0$ )	—	—	$BV_{EBO}$	6	—	Vdc
Collector Cutoff Current ( $V_{CB} = 40 \text{ Vdc}$ , $I_E = 0$ )	—	—	$I_{CBO}$	—	0.5	$\mu\text{Adc}$

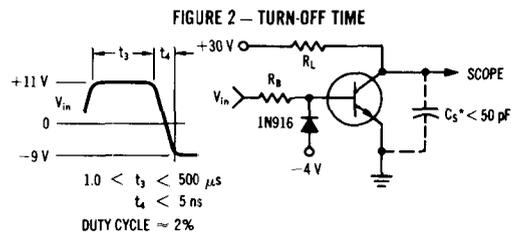
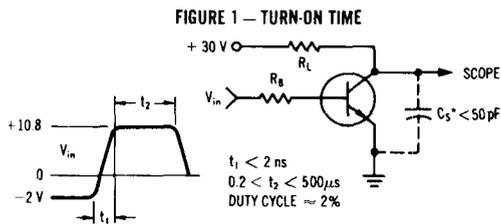
**ON CHARACTERISTICS**

DC Current Gain ( $I_C = 500 \text{ mAdc}$ , $V_{CE} = 2 \text{ Vdc}$ ) ( $I_C = 1 \text{ Adc}$ , $V_{CE} = 5 \text{ Vdc}$ )	9	—	$h_{FE}$	25 15	150 —	—
Collector-Emitter Saturation Voltage ( $I_C = 500 \text{ mAdc}$ , $I_B = 50 \text{ mAdc}$ ) ( $I_C = 1 \text{ Adc}$ , $I_B = 100 \text{ mAdc}$ )	10, 11	—	$V_{CE(sat)}$	— —	0.6 0.9	Vdc
Base-Emitter Saturation Voltage ( $I_C = 500 \text{ mAdc}$ , $I_B = 50 \text{ mAdc}$ ) ( $I_C = 1 \text{ Adc}$ , $I_B = 100 \text{ mAdc}$ )	11	—	$V_{BE(sat)}$	0.8 —	1.0 1.3	Vdc

**DYNAMIC CHARACTERISTICS**

Current-Gain – Bandwidth Product ( $I_C = 50 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 100 \text{ MHz}$ )	—	—	$f_T$	200	—	MHz
Collector-Base Capacitance ( $V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $f = 100 \text{ kHz}$ , emitter guarded)	3	—	$C_{cb}$	—	9	pF
Emitter-Base Capacitance ( $V_{BE} = 0.5 \text{ Vdc}$ , $I_C = 0$ , $f = 100 \text{ kHz}$ , collector guarded)	3	—	$C_{eb}$	—	80	pF
Turn-On Time ( $V_{CC} = 30 \text{ Vdc}$ , $V_{EB(off)} = 2 \text{ Vdc}$ , $I_C = 500 \text{ mAdc}$ , $I_{B1} = 50 \text{ mAdc}$ , $R_B = 200 \text{ ohms}$ , $R_L = 60 \text{ ohms}$ )	1, 5, 6	—	$t_{on}$	—	30	ns
Turn-Off Time ( $V_{CC} = 30 \text{ Vdc}$ , $I_C = 500 \text{ mAdc}$ , $I_{B1} = I_{B2} = 50 \text{ mAdc}$ , $R_B = 200 \text{ ohms}$ , $R_L = 60 \text{ ohms}$ )	2, 6, 7, 8	—	$t_{off}$	—	50	ns
Turn-On Time ( $V_{CC} = 30 \text{ Vdc}$ , $V_{EB(off)} = 2 \text{ Vdc}$ , $I_C = 1 \text{ Adc}$ , $I_{B1} = 100 \text{ mAdc}$ , $R_B = 100 \text{ ohms}$ , $R_L = 30 \text{ ohms}$ )	1, 5, 6	—	$t_{on}$	—	40	ns
Turn-Off Time ( $V_{CC} = 30 \text{ Vdc}$ , $I_C = 1 \text{ Adc}$ , $I_{B1} = I_{B2} = 100 \text{ mAdc}$ , $R_B = 100 \text{ ohms}$ , $R_L = 30 \text{ ohms}$ )	2, 6, 7, 8	—	$t_{off}$	—	50	ns

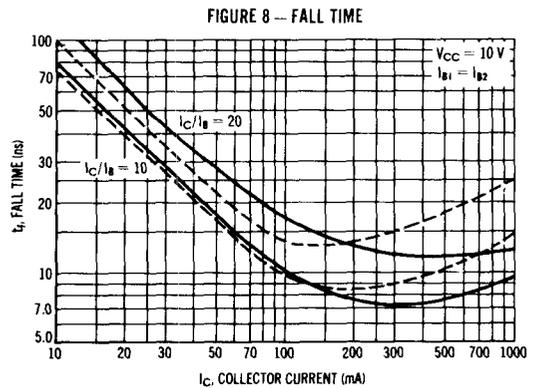
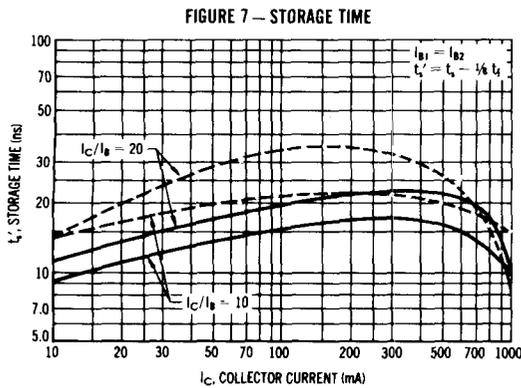
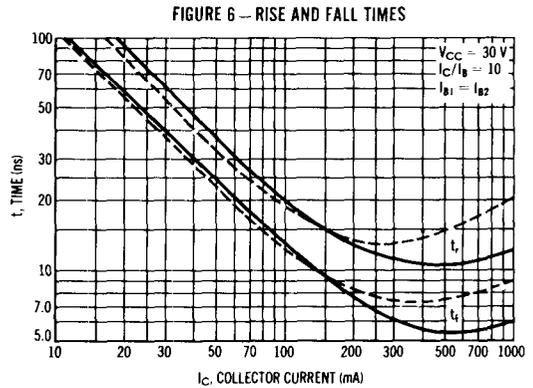
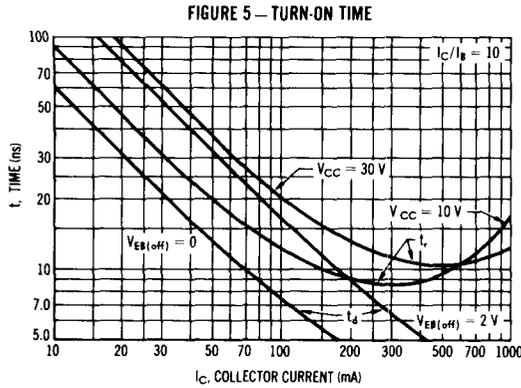
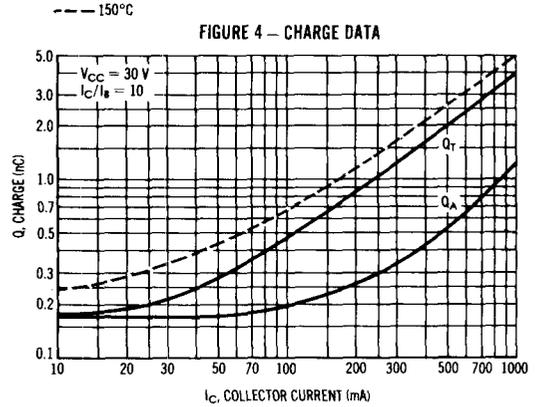
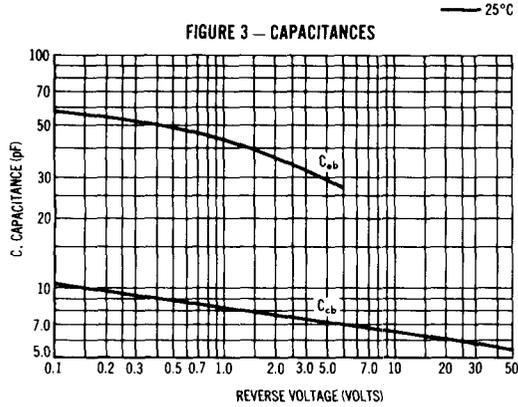
**SWITCHING TIME EQUIVALENT TEST CIRCUITS**



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

**MM3724, MM3725** (continued)

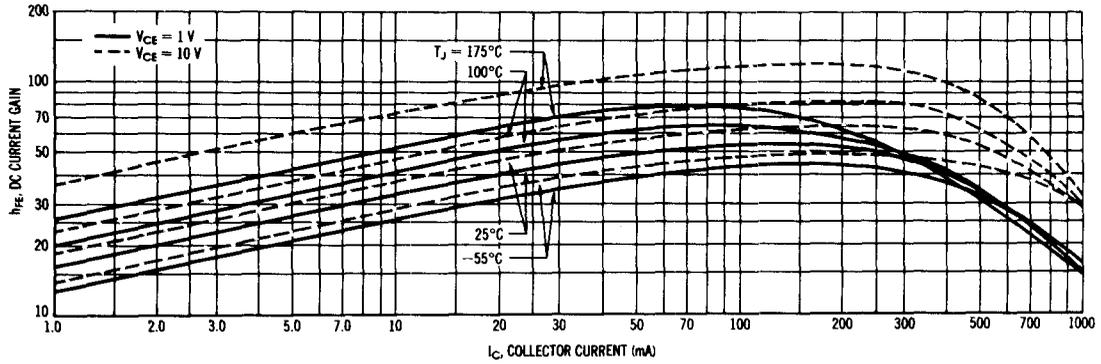
**TRANSIENT CHARACTERISTICS**



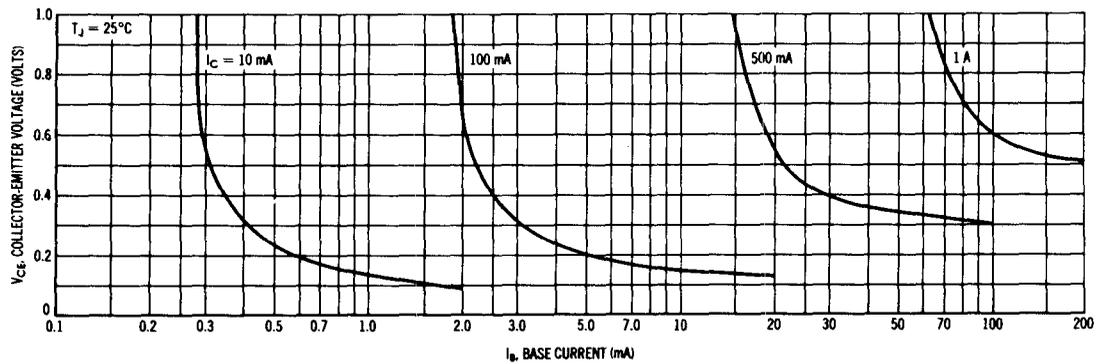
**MM3724, MM3725** (continued)

**STATIC CHARACTERISTICS**

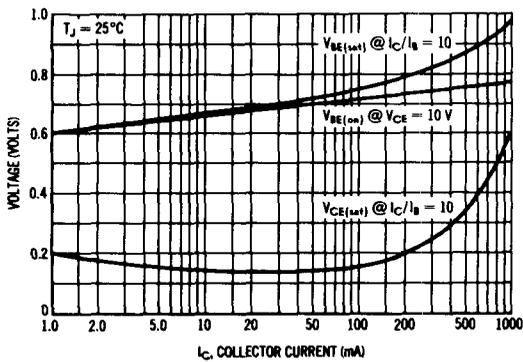
**FIGURE 9 — CURRENT GAIN**



**FIGURE 10 — SATURATION REGION**



**FIGURE 11 — "ON" VOLTAGES**



**FIGURE 12 — TEMPERATURE COEFFICIENTS**

