

# MPQ3546 (SILICON)

For Specifications, See MHQ3546 Data.

# MPQ3725 (SILICON)

## MPQ3725A

### NPN SILICON ANNULAR QUAD CORE DRIVER TRANSISTORS

... designed for medium-current, high speed switching and driver applications.

- Collector-Emitter Breakdown Voltage @  $I_C = 10 \text{ mA dc}$  –  
 $BV_{CEO} = 40 \text{ Vdc (Min)}$  – MPQ3725  
 $= 50 \text{ Vdc (Min)}$  – MPQ3725A
- Fast Switching Times @  $I_C = 500 \text{ mA dc}$  –  
 $t_{on} = 20 \text{ ns (Typ)}$   
 $t_{off} = 50 \text{ ns (Typ)}$

### QUAD DUAL-IN-LINE

### NPN SILICON CORE DRIVER TRANSISTORS



### MAXIMUM RATINGS

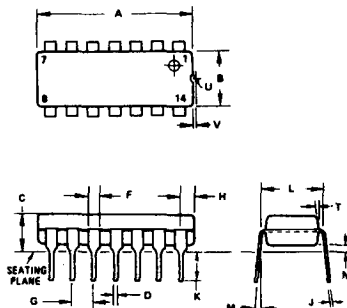
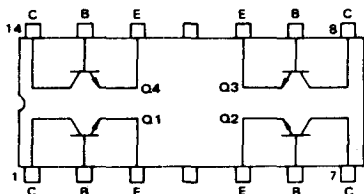
Rating	Symbol	MPQ3725	MPQ3725A	Unit
Collector-Emitter Voltage	$V_{CEO}$	40	50	Vdc
Collector-Emitter Voltage	$V_{CES}$	60	70	Vdc
Emitter-Base Voltage	$V_{EB}$	5.0		Vdc
Collector Current – Continuous	$I_C$	1.0		A dc
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150		$^{\circ}\text{C}$
		One Transistor	Four Transistors Equal Power	
Total Power Dissipation @ $T_A = 25^{\circ}\text{C}$ Derate above $25^{\circ}\text{C}$	$P_D$	1.0 8.0	2.5 20	Watts $\text{mW}/^{\circ}\text{C}$

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max		Unit
		One Transistor	Effective For Four Transistors	
Thermal Resistance, Junction to Ambient*	$R_{\theta JA}$	125	50	$^{\circ}\text{C}/\text{W}$

\* $R_{\theta JA}$  is measured with the device soldered into a typical printed circuit board.

### CONNECTION DIAGRAM



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	18.03	18.79	0.710	0.740
B	6.00	6.60	0.240	0.260
C	4.06	4.57	0.160	0.180
D	5.08	5.71	0.200	0.225
E	1.02	1.05	0.040	0.041
G	2.54 BSC		100 BSC	
H	1.32	1.83	0.052	0.072
J	2.3	2.6	0.090	0.104
K	2.52	2.43	0.115	0.096
L	7.37	7.87	0.290	0.310
M	1.60		0.063	
N	64	60	0.025	0.024
V	70 TYP		70 TYP	
U	84 MAX		0.26 MAX	
W	13	38	0.051	0.015

Dimension "L" to lead centerline when formed parallel.

CASE 646  
TO-116

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

Characteristic	Symbol	Min	Typ	Max	Unit	
<b>OFF CHARACTERISTICS</b>						
Collector-Emitter Breakdown Voltage (1) ( $I_C = 10\text{ mA dc}, I_B = 0$ )	MPQ3725 MPQ3725A	$BV_{CEO}$	40 50	—	—	Vdc
Collector-Emitter Breakdown Voltage ( $I_C = 100\text{ }\mu\text{A dc}, V_{BE} = 0$ )	MPQ3725 MPQ3725A	$BV_{CES}$	60 70	—	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 10\text{ }\mu\text{A dc}, I_C = 0$ )		$BV_{EBO}$	5.0	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 40\text{ Vdc}, I_E = 0$ )		$I_{CBO}$	—	—	0.5	$\mu\text{A dc}$

**ON CHARACTERISTICS (1)**

DC Current Gain ( $I_C = 100\text{ mA dc}, V_{CE} = 1.0\text{ Vdc}$ )	MPQ3725 MPQ3725A	$h_{FE}$	35 40	75 80	200 —	—
( $I_C = 500\text{ mA dc}, V_{CE} = 2.0\text{ Vdc}$ )	MPQ3725 MPQ3725A		25 30	45 50	— —	
Collector-Emitter Saturation Voltage ( $I_C = 500\text{ mA dc}, I_B = 50\text{ mA dc}$ )		$V_{CE(sat)}$	—	0.32	0.45	Vdc
Base-Emitter Saturation Voltage ( $I_C = 500\text{ mA dc}, I_B = 50\text{ mA dc}$ )		$V_{BE(sat)}$	0.8	0.9	1.0	Vdc

**DYNAMIC CHARACTERISTICS**

Current-Gain-Bandwidth Product ( $I_C = 50\text{ mA dc}, V_{CE} = 10\text{ Vdc}, f = 100\text{ MHz}$ )	MPQ3725 MPQ3725A	$f_T$	250 200	275 250	— —	MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}, I_E = 0, f = 100\text{ kHz}$ )		$C_{ob}$	—	5.1	10	pF
Input Capacitance ( $V_{BE} = 0.5\text{ Vdc}, I_C = 0, f = 100\text{ kHz}$ )		$C_{ib}$	—	62	80	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time (Figure 1) ( $I_C = 500\text{ mA dc}, I_{B1} = 50\text{ mA dc}, V_{BE(off)} = 3.8\text{ Vdc}$ )		$t_{on}$	—	20	35	ns
Turn-Off Time (Figure 1) ( $I_C = 500\text{ mA dc}, I_{B1} = I_{B2} = 50\text{ mA dc}$ )		$t_{off}$	—	50	60	ns

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

FIGURE 1 – SWITCHING TIMES TEST CIRCUIT

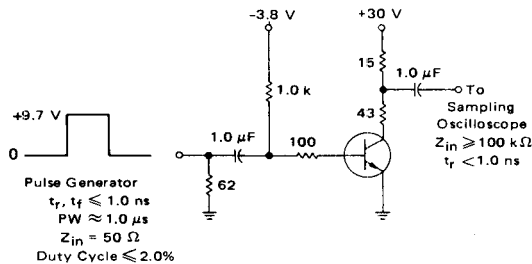


FIGURE 2 – DC CURRENT GAIN

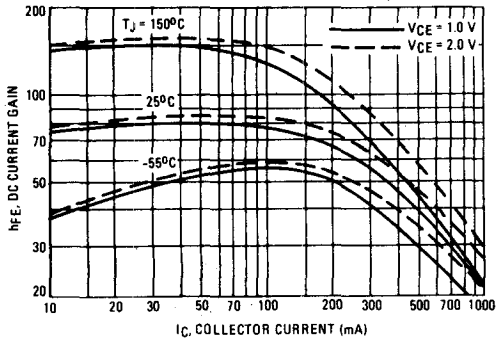


FIGURE 3 – COLLECTOR SATURATION REGION

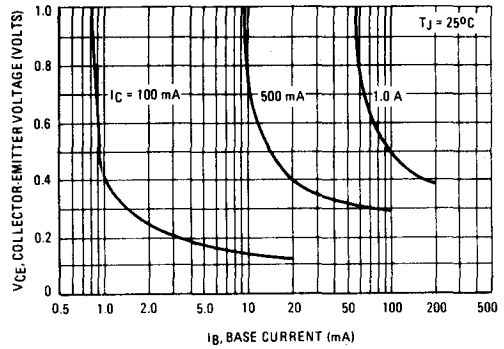


FIGURE 4 – "ON" VOLTAGES

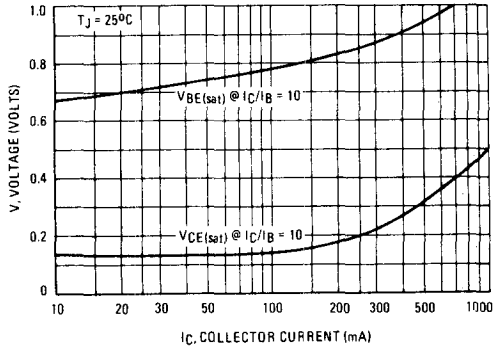


FIGURE 5 – TEMPERATURE COEFFICIENTS

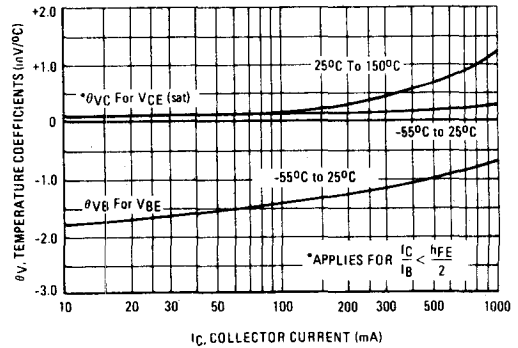


FIGURE 6 – CAPACITANCE

