

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 @ $I_C = 500 \text{ mA dc}$ –
 $t_{on} = 20 \text{ ns (Typ)}$
 $t_{off} = 50 \text{ ns (Typ)}$

MAXIMUM RATINGS

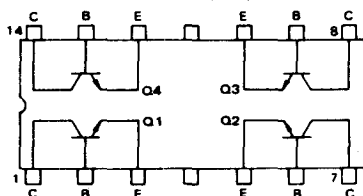
Rating	Symbol	MPQ3725	MPQ3725A	Unit
Collector-Emitter Voltage	V_{CEO}	40	50	Vdc
Collector-Emitter Voltage	V_{CES}	60	70	Vdc
Emitter-Base Voltage	V_{EB}	5.0		Vdc
Collector Current – Continuous	I_C	1.0		A dc
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150		$^{\circ}\text{C}$
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

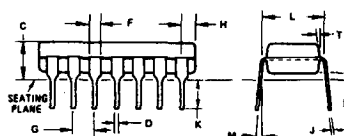
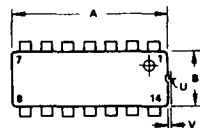
* $R_{\theta JA}$ is measured with the device soldered into a typical printed circuit board.

CONNECTION DIAGRAM



QUAD DUAL-IN-LINE

NPN SILICON CORE DRIVER TRANSISTORS



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	18.03	18.79	7.10	7.40
B	6.00	6.60	.240	.260
C	6.00	6.57	.180	.180
D	.50	.51	.015	.020
E	1.02	1.05	.040	.065
F	2.54 BSC		100 BSC	
G	1.27	1.27	.052	.052
H	.25	.25	.010	.010
I	2.52	2.43	.115	.120
J	7.37	7.37	.290	.310
K	.50	.50	.020	.020
L	.54	.54	.025	.025
M	.54	.54	.025	.025
N	.54	.54	.025	.025
O	.54	.54	.025	.025
P	.54	.54	.025	.025
Q	.54	.54	.025	.025
R	.54	.54	.025	.025
S	.54	.54	.025	.025
T	.54	.54	.025	.025
U	.54	.54	.025	.025
V	.54	.54	.025	.025
W	.54	.54	.025	.025
X	.54	.54	.025	.025
Y	.54	.54	.025	.025
Z	.54	.54	.025	.025

Dimension "L" is 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
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (1) ($I_C = 10\text{ mAdc}$, $I_B = 0$)	MPQ3725 MPQ3725A BV_{CEO}	40 50	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 100\text{ }\mu\text{Adc}$, $V_{BE} = 0$)	MPQ3725 MPQ3725A BV_{CES}	60 70	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{Adc}$, $I_C = 0$)	BV_{EBO}	5.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 40\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	—	0.5	μAdc

ON CHARACTERISTICS (1)

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

DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 100\text{ MHz}$)	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) ($I_C = 500\text{ mAdc}$, $I_{B1} = 50\text{ mAdc}$, $V_{BE(off)} = 3.8\text{ Vdc}$)	t_{on}	—	20	35	ns
Turn-Off Time (Figure 1) ($I_C = 500\text{ mAdc}$, $I_{B1} = I_{B2} = 50\text{ mAdc}$)	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

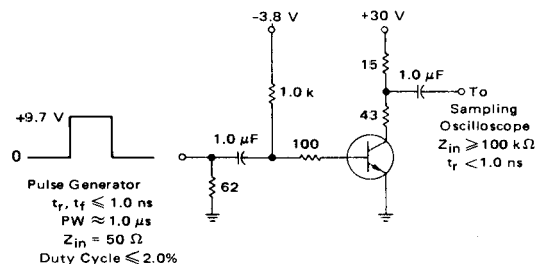


FIGURE 2 – DC CURRENT GAIN

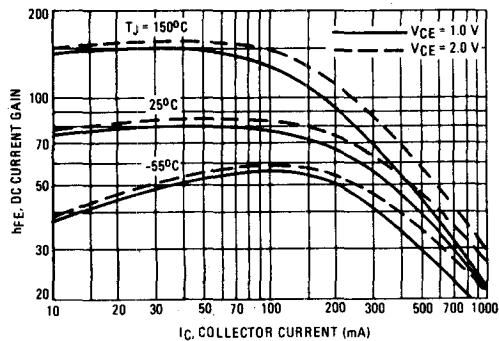


FIGURE 3 – COLLECTOR SATURATION REGION

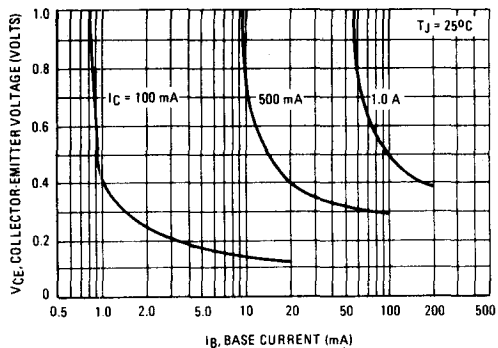


FIGURE 4 – "ON" VOLTAGES

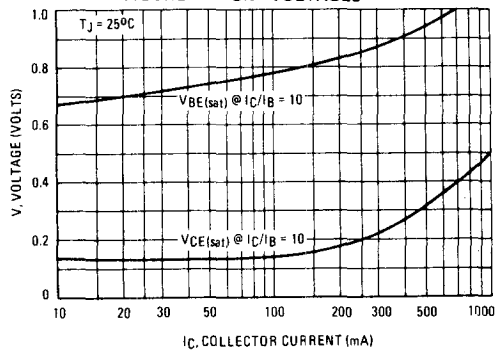


FIGURE 5 – TEMPERATURE COEFFICIENTS

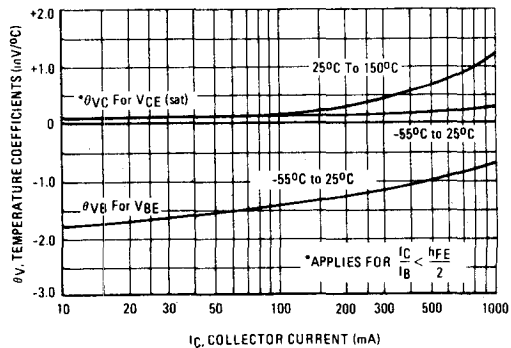


FIGURE 6 – CAPACITANCE

