

MHQ3546 (SILICON)

MPQ3546

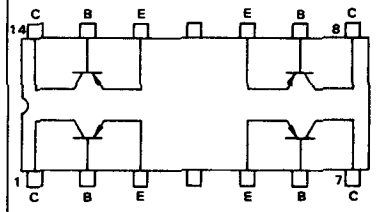
QUAD DUAL-IN-LINE PNP SILICON ANNULAR SWITCHING TRANSISTORS

... designed for low-level, high-speed switching applications.

- Choice of Ceramic or Plastic Package
- High Current-Gain-Bandwidth Product –
 $f_T = 1000 \text{ MHz (Typ) @ } I_C = 10 \text{ mAdc}$
- Fast Switching Times
 $t_{on} = 15 \text{ ns (Typ)}$
 $t_{off} = 25 \text{ ns (Typ)}$
- Transistor Similar to 2N3546
- TO-116 Packaging – Compact Size Compatible With IC Automatic Insertion Equipment

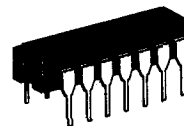
QUAD DUAL-IN-LINE PNP SILICON SWITCHING TRANSISTOR

CONNECTION DIAGRAM

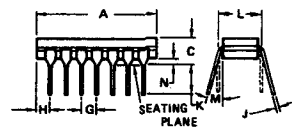
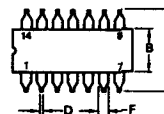


MAXIMUM RATINGS

Rating		Symbol	Value		Unit
Collector-Emitter Voltage		V_{CE0}	12		Vdc
Collector-Base Voltage		V_{CB}	15		Vdc
Emitter-Base Voltage		V_{EB}	4.5		Vdc
Collector Current – Continuous		I_C	200		mAdc
			Each Transistor	Total Device	
Total Device Dissipation @ $T_A = 25^{\circ}\text{C}$		P_D	0.5	1.5	Watts
Derate above 25°C		MHQ3546 MPQ3546	2.86 4.0	8.58 12	mW/ $^{\circ}\text{C}$
Operating and Storage Junction Temperature Range		T_J, T_{stg}	-65 to +200 -55 to +150		$^{\circ}\text{C}$



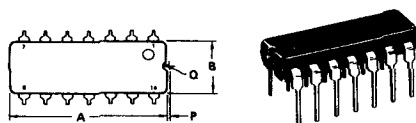
MHQ3546
CERAMIC
CASE 632-02
TO-116



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	16.8	19.9	0.660	0.785
B	5.59	7.11	0.220	0.280
C	—	5.08	—	0.200
D	0.381	0.594	0.015	0.023
E	0.77	1.77	0.030	0.070
F	2.54	—	0.100	—
G	0.203	0.381	0.008	0.015
H	—	1.52	—	0.060
I	—	1.52	—	0.060
J	—	1.52	—	0.060
K	—	1.52	—	0.060
L	—	1.52	—	0.060
M	—	1.52	—	0.060
N	—	1.52	—	0.060
P	—	1.52	—	0.060

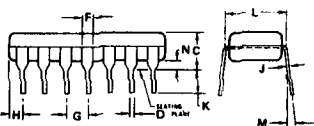
All JEDEC dimensions and notes apply.

NOTE:
DIMENSION "L" TO CENTER OF LEADS WHEN FORMED PARALLEL.



MPQ3546

CASE 646
PLASTIC PACKAGE



NOTES:
1. LEADS WITHIN 0.13 mm (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.
2. DIMENSION "L" TO CENTER OF LEADS WHEN FORMED PARALLEL.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	16.16	18.80	0.715	0.740
B	6.10	6.80	0.240	0.260
C	4.96	4.57	0.190	0.180
D	0.38	0.51	0.015	0.020
E	1.02	1.52	0.040	0.060
F	2.54	—	0.100	—
G	0.203	0.381	0.008	0.015
H	—	1.52	—	0.060
I	—	1.52	—	0.060
J	—	1.52	—	0.060
K	—	1.52	—	0.060
L	—	1.52	—	0.060
M	—	1.52	—	0.060
N	—	1.52	—	0.060
P	—	1.52	—	0.060

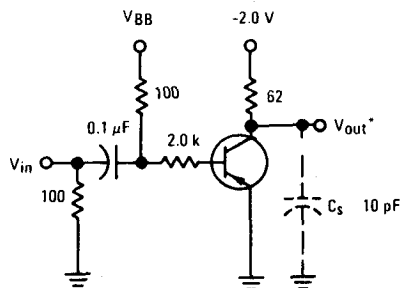
MHQ3546, MPQ3546 (continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(1) (I _C = 10 mA _{dc} , I _B = 0)	BV _{CEO}	12	—	—	V _{dc}
Collector-Base Breakdown Voltage (I _C = 10 μA _{dc} , I _E = 0)	BV _{CBO}	15	—	—	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 10 μA _{dc} , I _C = 0)	BV _{EBO}	4.5	—	—	V _{dc}
Collector Cutoff Current (V _{CB} = 10 V _{dc} , I _E = 0)	I _{CBO}	—	—	0.1	μA _{dc}
Emitter Cutoff Current (V _{BE} = 3.0 V _{dc} , I _C = 0)	I _{EBO}	—	—	0.1	μA _{dc}
ON CHARACTERISTICS					
DC Current Gain(1) (I _C = 10 mA _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 100 mA _{dc} , V _{CE} = 1.0 V _{dc})	h _{FE}	30 15	— —	— —	—
Collector-Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc})	V _{CE(sat)}	—	—	0.25	V _{dc}
Base-Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc})	V _{BE(sat)}	—	—	0.9	V _{dc}
DYNAMIC CHARACTERISTICS					
Current-Gain-Bandwidth Product(1) (I _C = 10 mA _{dc} , V _{CE} = 10 V _{dc} , f = 100 MHz)	f _T	600	1000	—	MHz
Output Capacitance (V _{CB} = 10 V _{dc} , I _E = 0, f = 1.0 MHz)	C _{ob}	—	2.0	6.0	pF
Input Capacitance (V _{BE} = 0.5 V _{dc} , I _C = 0, f = 1.0 MHz)	C _{ib}	—	3.5	8.0	pF
SWITCHING CHARACTERISTICS (Figure 1)					
Turn-On Time (V _{CC} = 2.0 V _{dc} , V _{BE(off)} = 3.0 V _{dc} , I _C = 30 mA _{dc} , I _{B1} = 1.5 mA _{dc})	t _{on}	—	15	—	ns
Turn-Off Time (V _{CC} = 2.0 V _{dc} , I _C = 30 mA _{dc} , I _{B1} = I _{B2} = 1.5 mA _{dc})	t _{off}	—	25	—	ns

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle = 2%.

FIGURE 1 – SWITCHING TIME TEST CIRCUIT



PULSE WIDTH > 200 ns
RISE TIME < 1.0 ns
Z_{in} = 50 Ω

t_{on}: V_{BB} = +3.0 V, V_{in} = -7.0 V_{dc}
t_{off}: V_{BB} = -4.0 V, V_{in} = +6.0 V_{dc}

* Oscilloscope Rise Time ≤ 1.0 ns