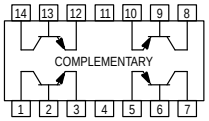
Quad Amplifier Transistors

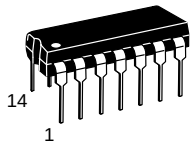
PNP Silicon



TYPE B

MPQ7091
MPQ7093*

***Motorola Preferred Device**



CASE 646–06, STYLE 1
TO–116

MAXIMUM RATINGS

Rating	Symbol	MPQ7091	MPQ7093	Unit
Collector–Emitter Voltage	V_{CEO}	–150	–250	Vdc
Collector–Base Voltage	V_{CBO}	–150	–250	Vdc
Emitter–Base Voltage	V_{EBO}	–5.0		Vdc
Collector Current — Continuous	I_C	–500		mAdc
		Each Die	**Four Die Equal Power**	
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	750 5.98	1700 13.6	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.25 10	3.2 25.6	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150		°C

THERMAL CHARACTERISTICS

Characteristic		Junction to Case	Junction to Ambient	Unit
Thermal Resistance	Each Die	100	167	°C/W
	Effective, 4 Die	39	73.5	°C/W
Coupling Factors	Q1–Q4 or Q2–Q3	46	56	%
	Q1–Q2 or Q3–Q4	5.0	10	%

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage (I_C = –1.0 mAdc, I_B = 0)	MPQ7091 MPQ7093	$V_{(BR)CEO}$	 –150 –250	 — —	 — —	Vdc
Collector–Base Breakdown Voltage (I_C = –100 μAdc, I_E = 0)	MPQ7091 MPQ7093	$V_{(BR)CBO}$	 –150 –250	 — —	 — —	Vdc
Emitter–Base Breakdown Voltage (I_E = –100 μAdc, I_C = 0)		$V_{(BR)EBO}$	 –5.0	 —	 —	Vdc
Collector Cutoff Current (V_{CB} = –120 Vdc, I_E = 0)	MPQ7091 MPQ7093	I_{CBO}	 — —	 — —	 –250 –250	nAdc
Emitter Cutoff Current (V_{EB} = –3.0 Vdc, I_C = 0)		I_{EBO}	 —	 —	 –100	nAdc

Preferred devices are Motorola recommended choices for future use and best overall value.

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

Characteristic	Symbol	Min	Max	Max	Unit
ON CHARACTERISTICS					
DC Current Gain (I_C = –1.0 mAdc, V_{CE} = –10 Vdc) (I_C = –10 mAdc, V_{CE} = –10 Vdc) (I_C = –30 mAdc, V_{CE} = –10 Vdc)	h_{FE}	 25 35 25	 40 55 50	 — — —	—
Collector–Emitter Saturation Voltage (I_C = –20 mAdc, I_B = –2.0 mAdc)	$V_{CE(sat)}$	—	–0.3	–0.5	Vdc
Base–Emitter Saturation Voltage (I_C = –20 mAdc, I_B = –2.0 mAdc)	$V_{BE(sat)}$	—	–0.7	–0.9	Vdc
SMALL–SIGNAL CHARACTERISTICS					
Current–Gain — Bandwidth Product (I_C = –10 mAdc, V_{CE} = –20 Vdc, f = 100 MHz)	f_T	50	70	—	MHz
Output Capacitance (V_{CB} = –20 Vdc, I_E = 0, f =1.0 MHz)	C_{obo}	—	3.0	5.0	pF
Input Capacitance (V_{EB} = –3.0 Vdc, I_C = 0, f = 1.0 MHz)	C_{ibo}	—	60	75	pF

DC CHARACTERISTICS

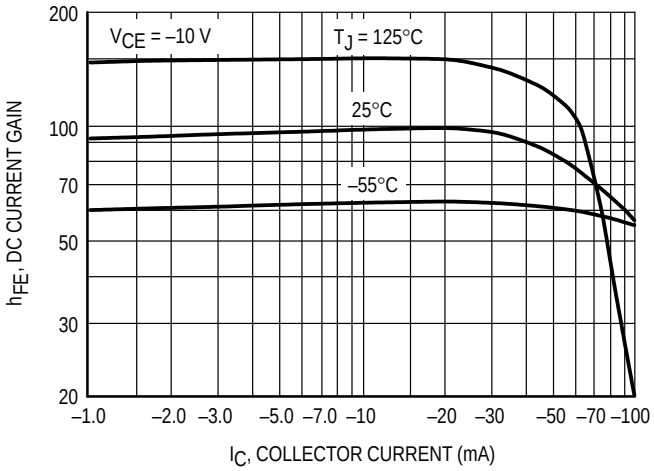


Figure 1. DC Current Gain

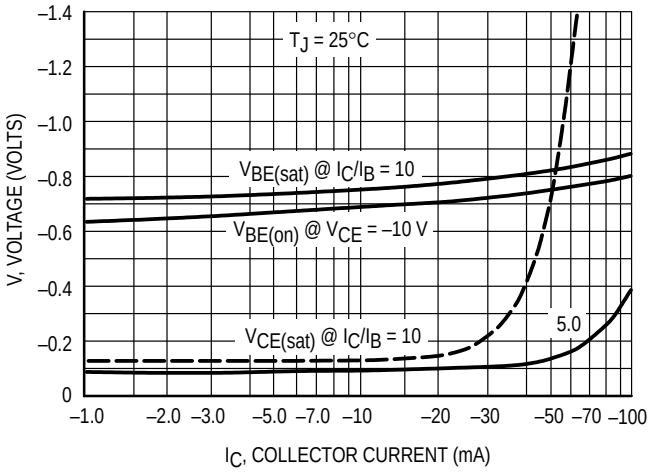


Figure 2. “ON” Voltages

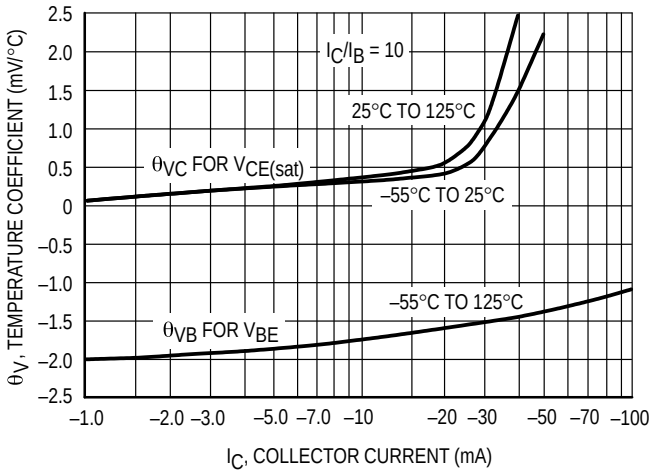
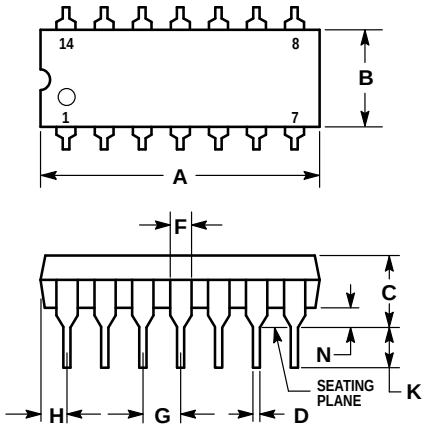


Figure 3. Temperature Coefficients

PACKAGE DIMENSIONS



STYLE 1:
PIN 1. COLLECTOR
2. BASE
3. EMITTER
4. NO CONNECTION
5. EMITTER
6. BASE
7. COLLECTOR
8. COLLECTOR
9. BASE
10. EMITTER
11. NO CONNECTION
12. EMITTER
13. BASE
14. COLLECTOR

NOTES:
1. LEADS WITHIN 0.13 (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.
2. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
3. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
4. ROUNDED CORNERS OPTIONAL.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.715	0.770	18.16	19.56
B	0.240	0.260	6.10	6.60
C	0.145	0.185	3.69	4.69
D	0.015	0.021	0.38	0.53
F	0.040	0.070	1.02	1.78
G	0.100 BSC		2.54 BSC	
H	0.052	0.095	1.32	2.41
J	0.008	0.015	0.20	0.38
K	0.115	0.135	2.92	3.43
L	0.300 BSC		7.62 BSC	
M	0°	10°	0°	10°
N	0.015	0.039	0.39	1.01

CASE 646–06
TO–116
ISSUE M

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How to reach us:

USA / EUROPE / Locations Not Listed: Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217. 303–675–2140 or 1–800–441–2447

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602–244–6609
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INTERNET: http://motorola.com/sps

JAPAN: Nippon Motorola Ltd.: SPD, Strategic Planning Office, 4–32–1,
Nishi–Gotanda, Shinagawa–ku, Tokyo 141, Japan. 81–3–5487–8488

ASIA / PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298