MOTOROLA Semiconductors
Avenue General-Eisenhower - 31023 Toulouse CEDEX - FRANCE

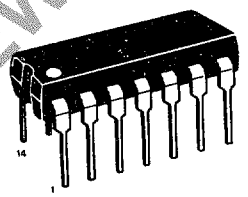
MPQ2906 MPQ2907 MPQ2906A MPQ2907A

QUAD DUAL-IN-LINE PNP SILICON ANNULAR GENERAL-PURPOSE TRANSISTORS

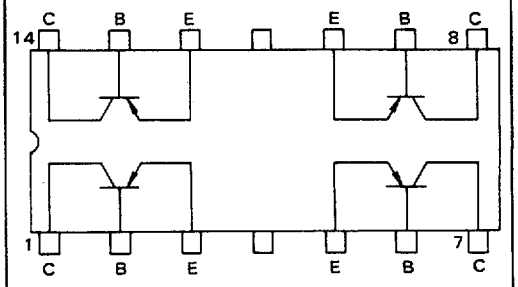
. . . designed for general-purpose switching circuits and DC to VHF amplifier applications.

- Maximum Power Dissipation @ T_A = 25°C
  P_D = 1.25 Watts — MPQ2906, MPQ2907
  — MPQ2906A, MPQ2907A
- High Collector-Base Breakdown Voltage —
  $V_{(BR)CBO}$ = 60 Vdc (Min) @ I_C = 10 μAdc
- DC Current Gain Specified — 10 to 300 mAdc
- High Current-Gain — Bandwidth Product —
  f_T = 350 MHz (Typ) @ I_C = 50 mAdc
- Transistors Similar to 2N2906,A and 2N2907,A
- Compact Size Compatible With IC Automatic Insertion Equipment
- Design Data Shown on MPQ6001, MPQ6501 Data Sheet

QUAD DUAL-IN-LINE PNP SILICON GENERAL-PURPOSE TRANSISTORS



CONNECTION DIAGRAM

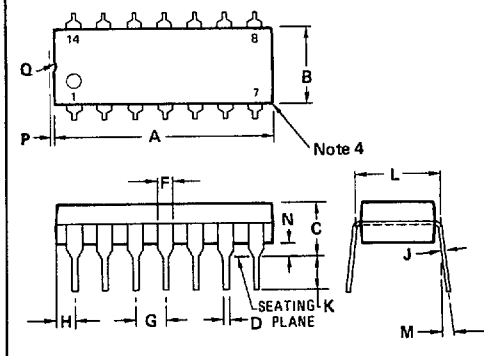


MAXIMUM RATINGS

Rating	Symbol	Value MPQ2906, 7	Value MPQ2906A, 7A	Unit
Collector-Emitter Voltage	V_{CEO}	40	60	Vdc
Collector-Base Voltage	V_{CB}	60		Vdc
Emitter-Base Voltage	V_{EB}	5.0		Vdc
Collector Current — Continuous	I_C	600		mAdc
		Each Transistor	Four Transistors Equal Power	
Total Power Dissipation @ T_A = 25°C	P_D			Watts
MPQ2906/2907		0.65	1.25	
MPQ2906A/2907A		0.5	0.9	
Derate above 25°C				mW/°C
MPQ2906/2707		5.18	10	
MPQ2906A/2907A		4.0	7.2	
Total Power Dissipation @ T_C = 25°C	P_D			Watts
MPQ2906/2907		1.0	3.0	
MPQ2906A/2907A		0.825	2.4	
Derate above 25°C				mW/°C
MPQ2906/2907		8.0	24	
MPQ2906A/2907A		6.7	19.2	
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				°C/W
Each Die —	MPQ2906/2907	125	193	
	MPQ2906A/2907A	151	250	
Effective, 4 Die —	MPQ2906/2907	41.6	100	
	MPQ2906A/2907A	52	134	
Coupling Factors				%
Q1-Q4 or Q2-Q3	MPQ2906/2907	30	60	
	MPQ2906A/2907A	34	70	
Q1-Q2 or Q3-Q4	MPQ2906/2907	2.0	24	
	MPQ2906A/2907A	2.0	26	



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	18.16	19.56	0.715	0.770
B	6.10	6.60	0.240	0.260
C	4.06	5.08	0.160	0.200
D	0.38	0.53	0.015	0.021
F	1.02	1.78	0.040	0.070
G	2.54 BSC		0.100 BSC	
H	1.32	2.41	0.052	0.095
J	0.20	0.38	0.008	0.015
K	2.92	3.43	0.115	0.135
L	7.62 BSC		0.300 BSC	
M	0°	10°	0°	10°
N	0.51	1.02	0.020	0.040

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.
3. DIMENSION "B" DOES NOT INCLUDE MOLD FLASH.
4. ROUNDED CORNERS OPTIONAL.

CASE 646-05
PLASTIC PACKAGE

Annular Semiconductors Patented by Motorola Inc.

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 mAdc, I_B = 0)	MPQ2906/2907 MPQ2906A/2907A	$V_{(BR)CEO}$	40 60	—	—	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)		$V_{(BR)CBO}$	60	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	5.0	—	—	Vdc
Collector Cutoff Current		I_{CBO}				nAdc
(V_{CB} = 30 Vdc, I_E = 0)	MPQ2906/2907		—	—	50	
(V_{CB} = 50 Vdc, I_E = 0)	MPQ2906A/2907A		—	—	10	
Emitter Cutoff Current (V_{CB} = 3.0 Vdc, I_E = 0)		I_{EBO}	—	—	50	nAdc
ON CHARACTERISTICS						
DC Current Gain[1]		h_{FE}				
(I_C = 100 μAdc, V_{CE} = 10 Vdc)	MPQ2906A/2907A		40/75	—	—	
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc)	MPQ2906A/2907A		40/100	—	—	
(I_C = 10 mAdc, V_{CE} = 10 Vdc)	MPQ2906/2906A		35/40	—	—	
	MPQ2907/2907A		75/100	—	—	
(I_C = 150 mAdc, V_{CE} = 10 Vdc)	MPQ2906/2906A		40	—	120	
	MPQ2907/2907A		100	—	300	
(I_C = 300 mAdc, V_{CE} = 10 Vdc)	MPQ2906/2906A		20/40	—	—	
	MPQ2907/2907A		30/50	—	—	
(I_C = 500 mAdc, V_{CE} = 10 Vdc)	MPQ2906/2906A		40/40	—	—	
	MPQ2907/2907A		50/50	—	—	
Collector-Emitter Saturation Voltage[1]		$V_{CE(sat)}$				Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)	MPQ2906/2907		—	—	0.4	
(I_C = 300 mAdc, I_B = 30 mAdc)	MPQ2906/2907		—	—	1.6	
(I_C = 500 mAdc, I_B = 50 mAdc)	MPQ2906A/2907A		—	—	1.6	
Base-Emitter Saturation Voltage[1]		$V_{BE(sat)}$				Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)	MPQ2906/2907		—	—	1.3	
(I_C = 300 mAdc, I_B = 30 mAdc)	MPQ2906/2907		—	—	2.6	
(I_C = 500 mAdc, I_B = 50 mAdc)	MPQ2906A/2907A		—	—	2.6	
DYNAMIC CHARACTERISTICS						
Current-Gain — Bandwidth Product[1] (I_C = 50 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)		f_T	200	350	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)		C_{ob}	—	6.0	8.0	pF
Input Capacitance (V_{BE} = 2.0 Vdc, I_C = 0, f = 100 kHz)		C_{ib}	—	20	30	pF
SWITCHING CHARACTERISTICS						
Turn-On time	MPQ2906/2907	t_{on}	—	30	—	ns
(V_{CC} = 30 Vdc, I_C = 150 mAdc, I_{B1} = 15 mAdc) (Figure 1)	MPQ2906A/2907A		—	—	45	
Turn-Off Time	MPQ2906/2907	t_{off}	—	100	—	ns
(V_{CC} = 6.0 Vdc, I_C = 150 mAdc, I_{B1} = I_{B2} = 15 mAdc) (Figure 2)	MPQ2906A/2907A		—	—	180	

[1]Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle = 2%.

EQUIVALENT RISE AND FALL TIMES

FIGURE 1 — DELAY AND RISE TIME TEST CIRCUIT

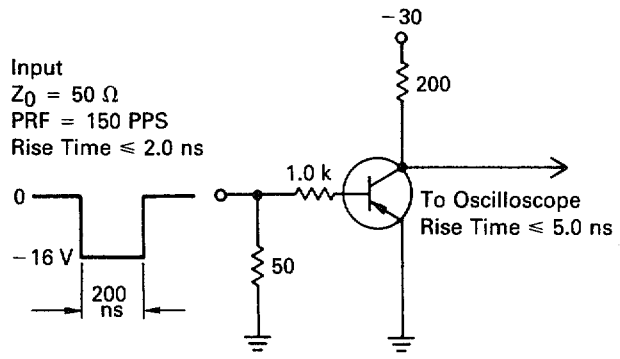
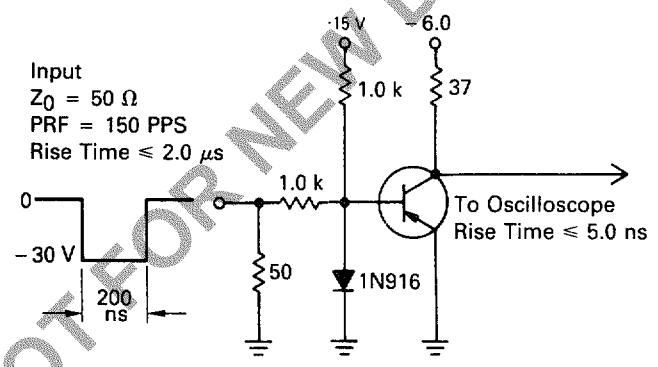


FIGURE 2 — STORAGE AND FALL TIME TEST CIRCUIT



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