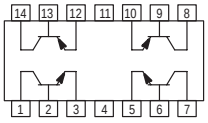
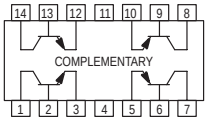
Quad Complementary Pair Transistors

NPN/PNP Silicon



MPQ6100A
TYPE A

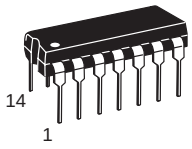


MPQ6600A1
TYPE B

MPQ6100A MPQ6600A1*

Voltage and Current are negative for PNP Transistors

***Motorola Preferred Device**



CASE 646–06, STYLE 1
TO–116

MAXIMUM RATINGS

Rating	Symbol	MPQ6100A MPQ6600A1		Unit
Collector–Emitter Voltage	V_{CEO}	45		Vdc
Collector–Base Voltage	V_{CBO}	60		Vdc
Emitter–Base Voltage	V_{EBO}	5.0		Vdc
Collector Current — Continuous	I_C	50		mAdc
		Each Transistor	**Four Transistors Equal Power**	
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	500 4.0	900 7.2	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	0.825 6.7	2.4 19.2	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(1)	Each Die Effective, 4 Die	151 52	250 139	°C/W °C/W
Coupling Factors	Q1–Q4 or Q2–Q3 Q1–Q2 or Q3–Q4	34 2.0	70 26	% %

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

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

REV 2

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage(2) (I_C = 10 mAdc, I_B = 0)	MPQ6100A, 6600A1	$V_{(BR)CEO}$	45	—	—	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 (V_{CB} = 50 Vdc, I_E = 0)		I_{CBO}	—	—	10	nAdc
ON CHARACTERISTICS(2)						
DC Current Gain		h_{FE}				—
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	MPQ6100A, 6600A1		100	—	—	
(I_C = 500 μAdc, V_{CE} = 5.0 Vdc)	MPQ6100A, 6600A1		150	—	—	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc)	MPQ6100A, 6600A1		150	—	—	
(I_C = 10 mAdc, V_{CE} = 5.0 Vdc)	MPQ6100A, 6600A1		125	—	—	
Collector–Emitter Saturation Voltage (I_C = 1.0 mAdc, I_B = 100 μAdc)		$V_{CE(sat)}$	—	—	0.25	Vdc
Base–Emitter Saturation Voltage (I_C = 1.0 mAdc, I_B = 100 μAdc)		$V_{BE(sat)}$	—	—	0.8	Vdc
SMALL–SIGNAL CHARACTERISTICS						
Current–Gain — Bandwidth Product (I_C = 500 μAdc, V_{CE} = 5.0 Vdc, f = 20 MHz)		f_T	50	—	—	MHz
Output Capacitance (V_{CB} = 5.0 Vdc, I_E = 0, f =1.0 MHz)		C_{obo}				pF
	PNP		—	1.2	4.0	
	NPN		—	1.8	4.0	
Input Capacitance (V_{EB} = 0.5 Vdc, I_C = 0, f = 1.0 MHz)		C_{ibo}				pF
	PNP		—	—	8.0	
	NPN		—	—	8.0	
Noise Figure (I_C = 100 μAdc, V_{CE} = 5.0 Vdc, R_S = 10 kΩ, f = 1.0 kHz, BW = 10 kHz)		NF	—	4.0	—	dB
MATCHING CHARACTERISTICS (MPQ6600A1 ONLY)						
DC Current Gain Ratio (I_C = 100 μAdc, V_{CE} = 5.0 Vdc)		h_{FE1}/h_{FE2}	0.8	—	1.0	—
Base–Emitter Voltage Differential (I_C = 100 μAdc, V_{CE} = 5.0 Vdc)		$\lvert V_{BE1}–V_{BE2}\rvert$	—	—	20	mVdc

2. Pulse Test: Pulse Width ≤ 300 μs; Duty Cycle ≤ 2.0%.

SPOT NOISE FIGURE

(V_{CE} = 10 Vdc, T_A = 25°C)

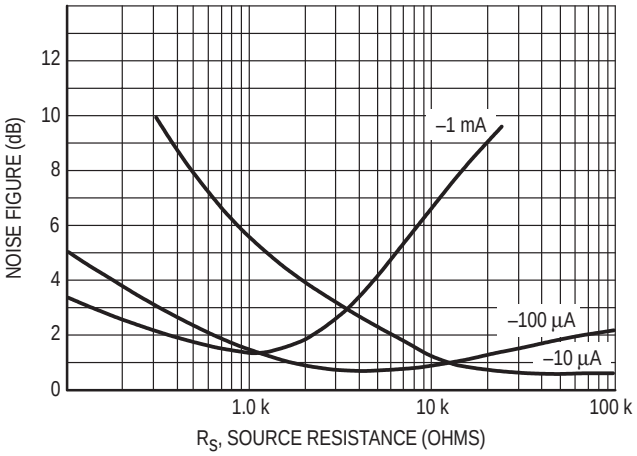


Figure 1. Source Resistance Effects, f = 1.0 kHz

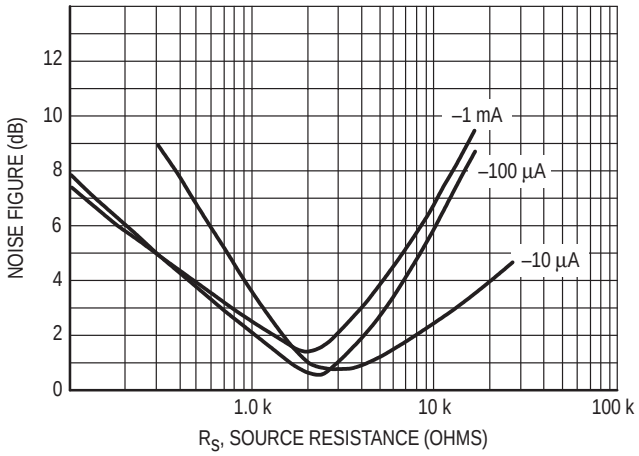


Figure 2. Source Resistance Effects, f = 10 Hz

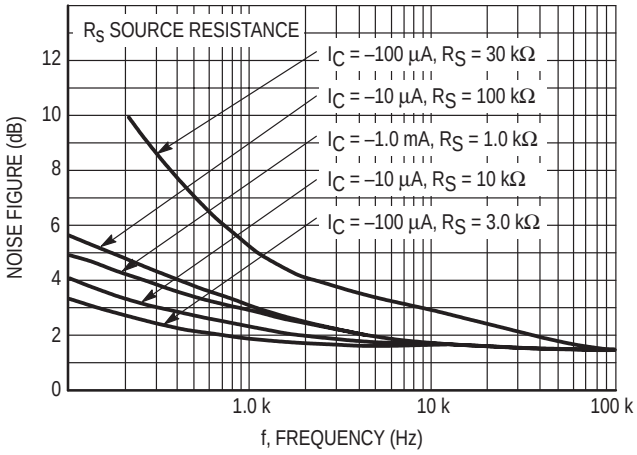


Figure 3. Frequency Effects

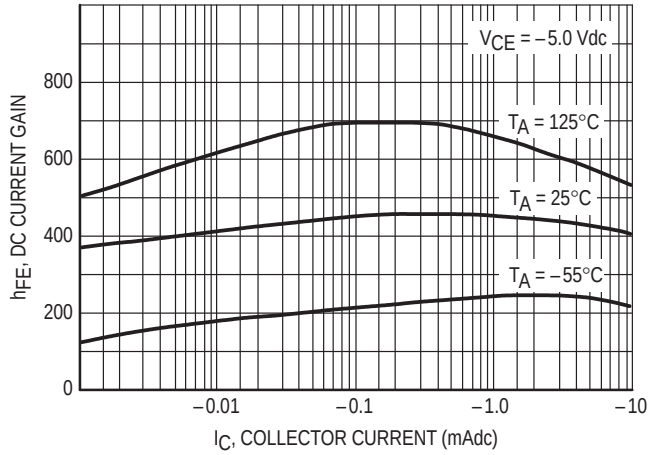


Figure 4. Typical Current Gain Characteristics