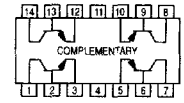
Quad Complementary Pair Transistor

NPN/PNP Silicon



TYPE B

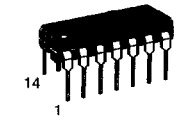
MPQ6700

MPQ6502
For Specifications,
See MPQ6001 Data

MPQ6600A1
For Specifications,
See MPQ6100A Data

Voltage and current are negative for PNP transistors

Motorola Preferred Device



CASE 646–06, STYLE 1
TO–116
TYPE B

MAXIMUM RATINGS

Rating	Symbol	Value		Unit
Collector–Emitter Voltage	V_{CEO}	40		Vdc
Collector–Base Voltage	V_{CBO}	40		Vdc
Emitter–Base Voltage	V_{EBO}	5.0		Vdc
Collector Current — Continuous	I_C	200		mAdc
		Each Transistor	Four Transistors Equal Power	
Total Device Dissipation @ T_A = 25°C(1) 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	825 6.7	2400 19.2	mW 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	151	250	°C/W
	Effective, 4 Die	52	139	°C/W
Coupling Factors	Q1–Q4 or Q2–Q3	34	70	%
	Q1–Q2 or Q3–Q4	2.0	26	%

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage(2) (I_C = 10 mAdc, I_B = 0)	$V_{(BR)CEO}$	40	—	Vdc
Collector–Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	$V_{(BR)CBO}$	40	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current (V_{CB} = 30 Vdc, I_E = 0)	I_{CBO}	—	50	nAdc
Emitter Cutoff Current (V_{EB} = 4.0 Vdc, I_C = 0)	I_{EBO}	—	50	nAdc

1. Second Breakdown occurs at power levels greater than 3 times the power dissipation rating.
2. Pulse Test: Pulse Width ≤ 300 μs; Duty Cycle ≤ 2.0%.

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

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

Characteristic		Symbol	Min	Max	Unit
ON CHARACTERISTICS(2)					
DC Current Gain		h_{FE}			—
(I_C = 0.1 mAdc, V_{CE} = 1.0 Vdc)			30	—	
(I_C = 1.0 mAdc, V_{CE} = 1.0 Vdc)			50	—	
(I_C = 10 mAdc, V_{CE} = 1.0 Vdc)			70	—	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
(I_C = 10 mAdc, I_B = 1.0 mAdc)			—	0.25	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$			Vdc
(I_C = 10 mAdc, I_B = 1.0 mAdc)			—	0.9	
SMALL–SIGNAL CHARACTERISTICS					
Current–Gain — Bandwidth Product(2)		f_T			MHz
(I_C = 10 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)			200	—	
Output Capacitance		C_{obo}			pF
(V_{CB} = 5.0 Vdc, I_E = 0, f =1.0 MHz)			—	4.5	
Input Capacitance		C_{ibo}			pF
(V_{EB} = 0.5 Vdc, I_C = 0, f = 1.0 MHz)	PNP		—	10	
	NPN		—	8.0	

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

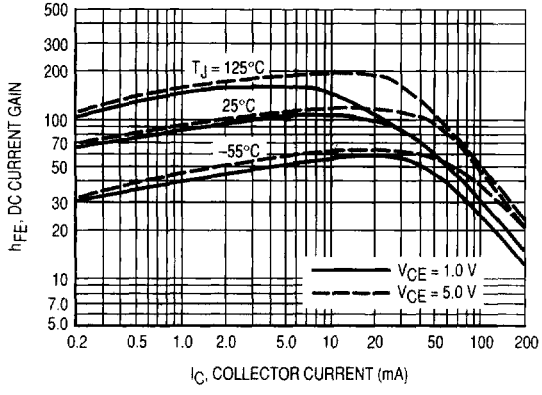


Figure 1. DC Current Gain

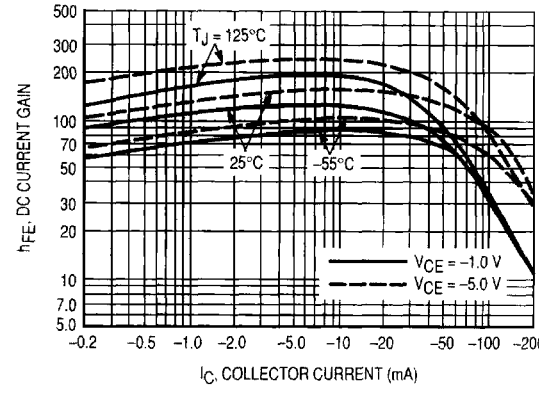


Figure 2. DC Current Gain

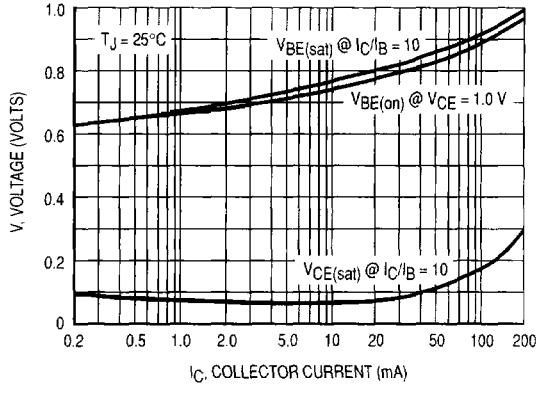


Figure 3. "ON" Voltage

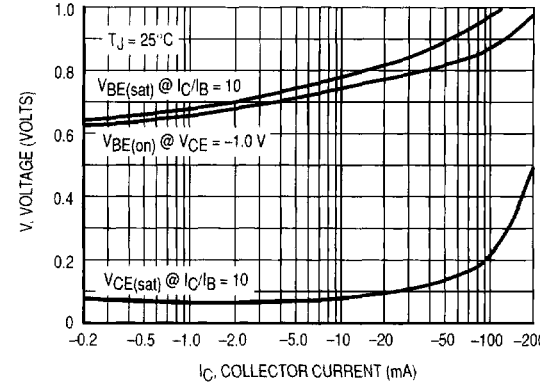


Figure 4. "ON" Voltage

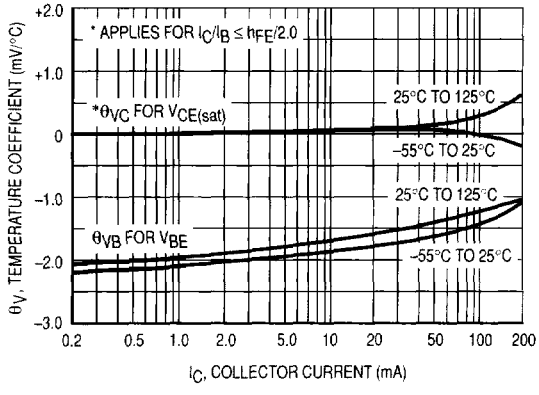


Figure 5. Temperature Coefficients

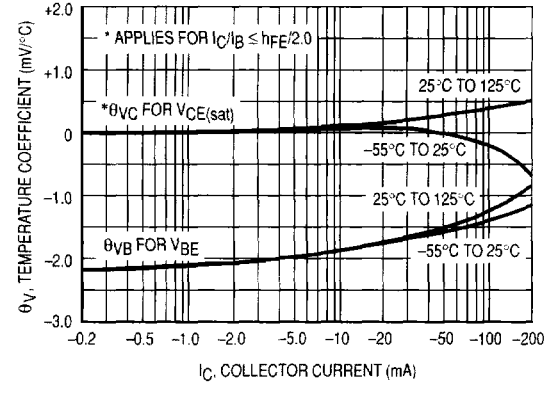


Figure 6. Temperature Coefficients

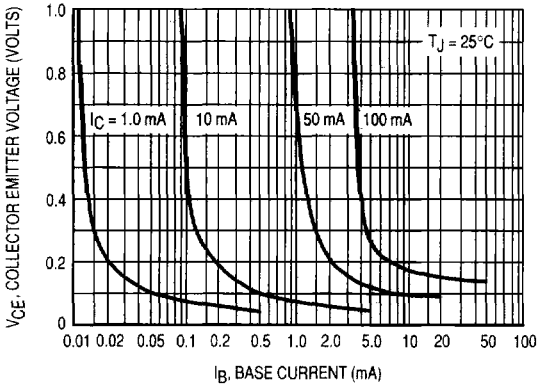


Figure 7. Collector Saturation Region

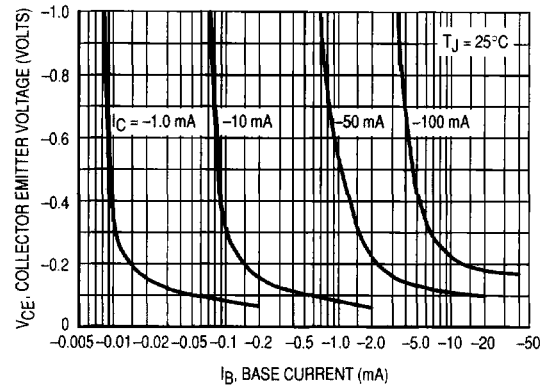


Figure 8. Collector Saturation Region

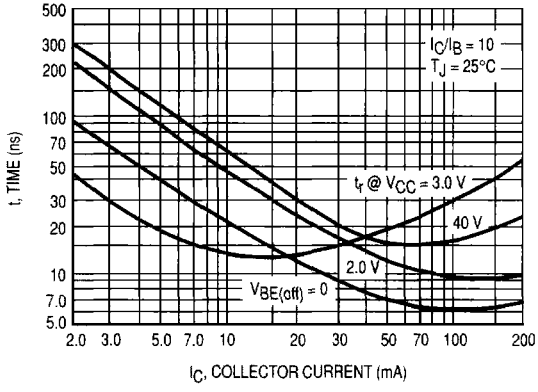


Figure 9. Turn–On Time

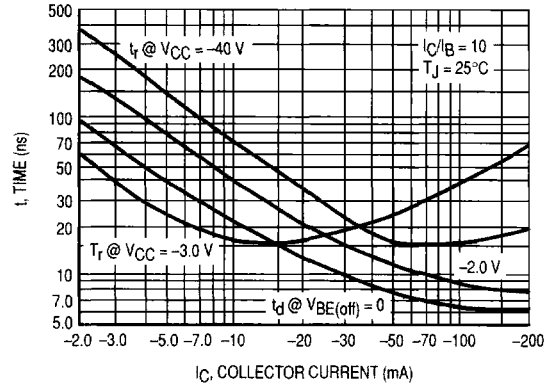


Figure 10. Turn–On Time

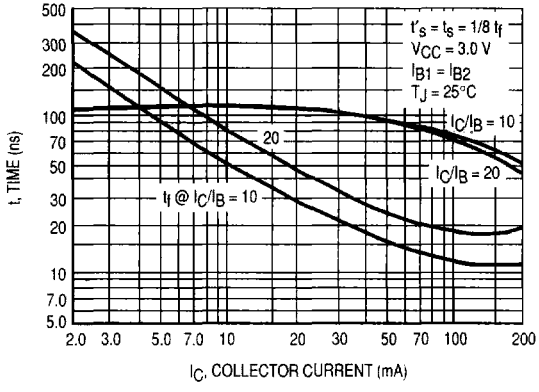


Figure 11. Turn–Off Time

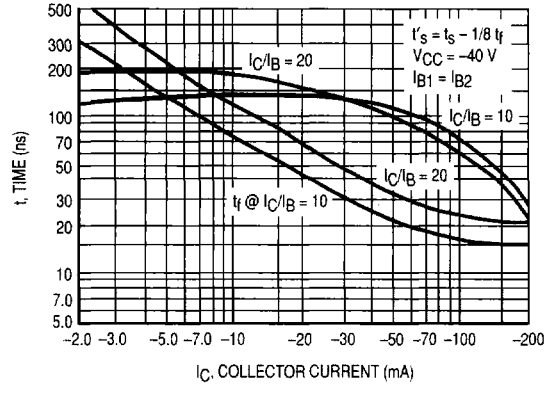


Figure 12. Turn–Off Time

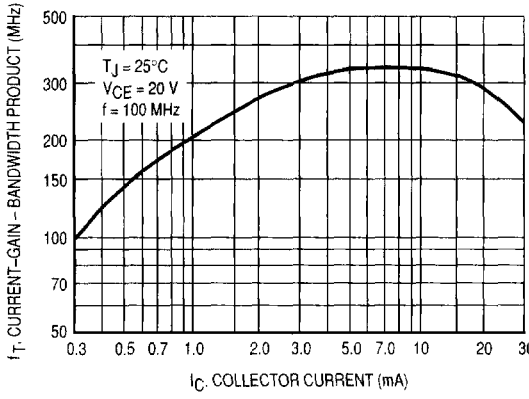


Figure 13. Current–Gain — Bandwidth Product

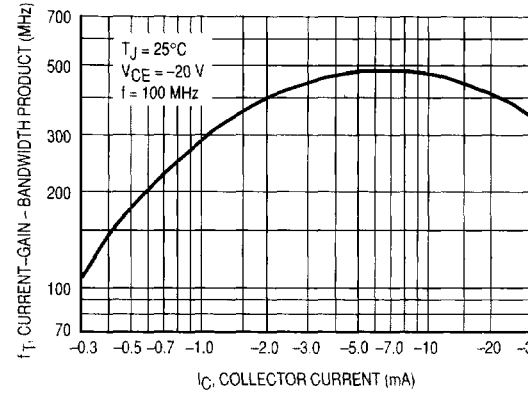


Figure 14. Current–Gain — Bandwidth Product

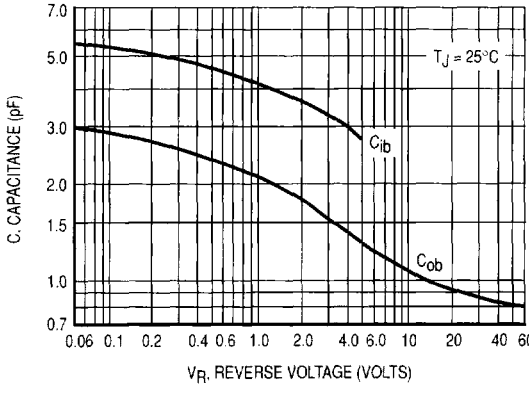


Figure 15. Capacitance

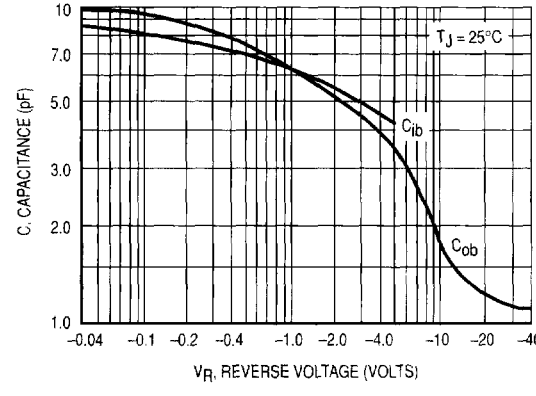


Figure 16. Capacitance