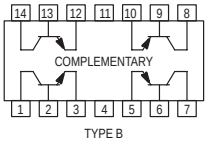
Quad Complementary Pair Transistor

NPN/PNP Silicon

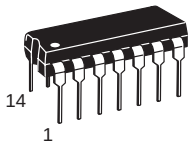


TYPE B

MPQ7051

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}	150		Vdc
Collector–Base Voltage	V_{CBO}	150		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 Effective, 4 Die	100 39	167 73.5	°C/W °C/W
Coupling Factors	Q1–Q4 or Q2–Q3 Q1–Q2 or Q3–Q4	46 5.0	56 10	% %

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	$V_{(BR)CEO}$	150	—	Vdc
Collector–Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	$V_{(BR)CBO}$	150	—	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)	I_{CBO}	—	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.

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

Characteristic		Symbol	Min	Max	Unit
ON CHARACTERISTICS					
DC Current Gain		h_{FE}			—
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc)			25	—	
(I_C = 10 mAdc, V_{CE} = 10 Vdc)			35	—	
(I_C = 30 mAdc, V_{CE} = 10 Vdc)			25	—	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
(I_C = 20 mAdc, I_B = 2.0 mAdc)			—	0.7	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$			Vdc
I_C = 20 mAdc, I_B = 2.0 mAdc)			—	0.9	
SMALL–SIGNAL CHARACTERISTICS					
Current–Gain — Bandwidth Product		f_T			MHz
(I_C = 10 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)			50	—	
Output Capacitance		C_{obo}			pF
(V_{CB} = 20 Vdc, I_C = 0, f =1.0 MHz)			—	6.0	
Input Capacitance		C_{ibo}			pF
(V_{EB} = 3.0 Vdc, I_C = 0, f = 1.0 MHz)	NPN		—	50	
	PNP		—	75	

DC CHARACTERISTICS

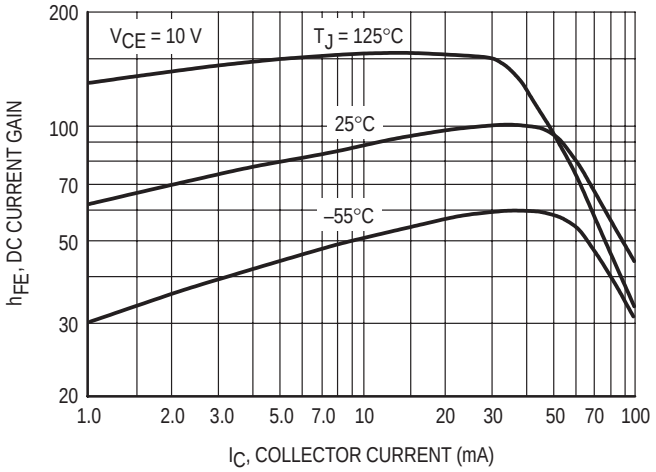


Figure 1. DC Current Gain

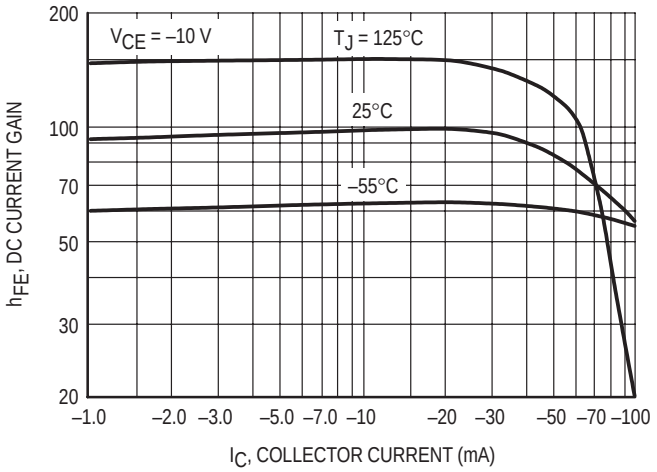


Figure 2. DC Current Gain

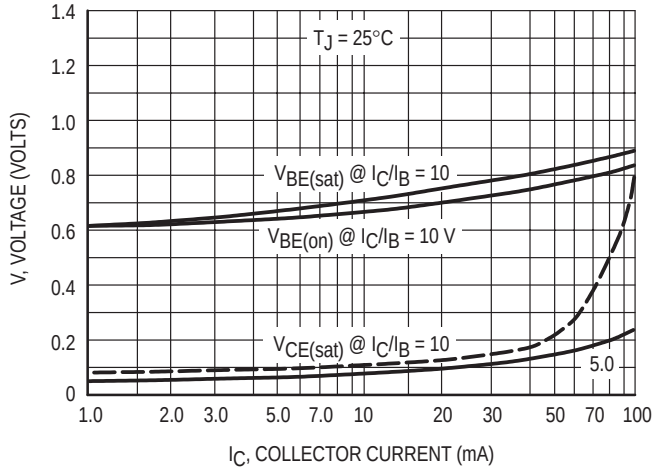


Figure 3. “ON” Voltages

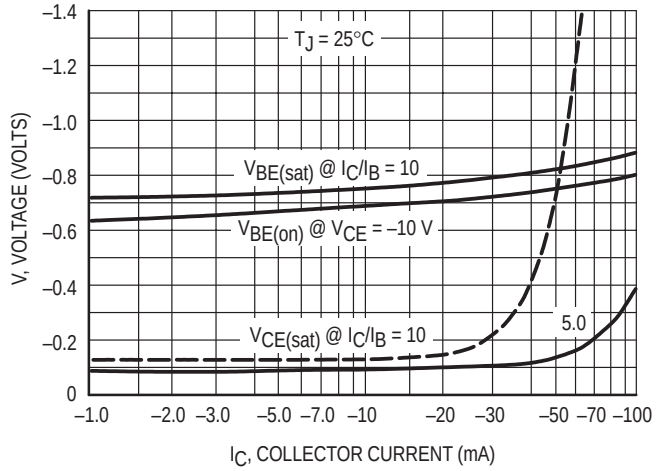


Figure 4. “ON” Voltages

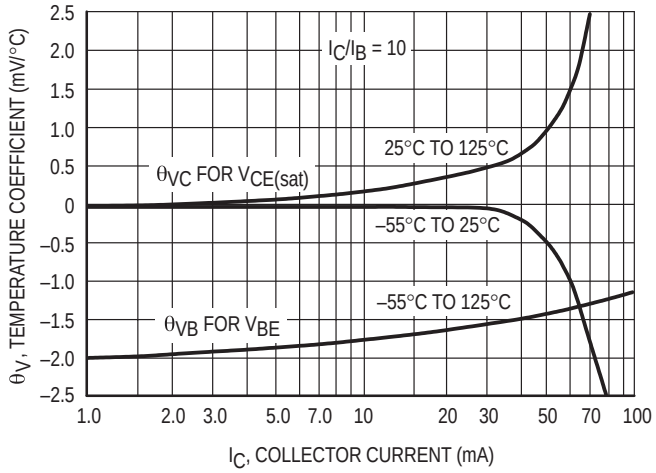


Figure 5. Temperature Coefficients

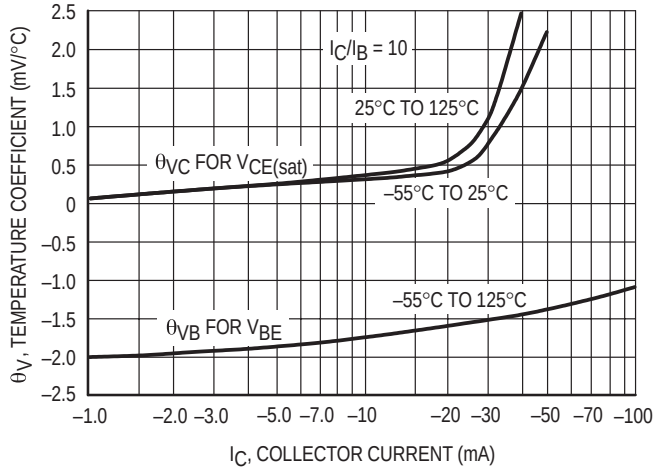


Figure 6. Temperature Coefficients