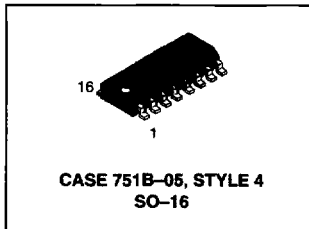
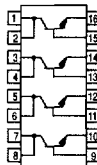


Quad General Purpose Transistors

NPN Silicon



MAXIMUM RATINGS

Rating	Symbol	MMPQ2222	MMPQ2222A	Unit
Collector-Emitter Voltage	V_{CEO}	30	40	Vdc
Collector-Base Voltage	V_{CB}	60	75	Vdc
Emitter-Base Voltage	V_{EB}	5.0		Vdc
Collector Current — Continuous	I_C	500		mAdc
		Each Transistor	Four Transistors Equal Power	
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	0.52 4.2	1.0 8.0	Watts mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	0.8 6.4	2.4 19.2	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150		$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 10 \text{ mAdc}, I_B = 0$)	MMPQ2222 MMPQ2222A	$V_{(BR)CEO}$	30 40	— —	Vdc
Collector-Base Breakdown Voltage ($I_C = 10 \mu\text{Adc}, I_E = 0$)	MMPQ2222 MMPQ2222A	$V_{(BR)CBO}$	60 75	— —	Vdc
Emitter-Base Breakdown Voltage ($I_B = 10 \mu\text{Adc}, I_C = 0$)		$V_{(BR)EBO}$	5.0 —	— —	Vdc
Collector Cutoff Current ($V_{CB} = 50 \text{ Vdc}, I_E = 0$) ($V_{CB} = 60 \text{ Vdc}, I_E = 0$)	MMPQ2222 MMPQ2222A	I_{CBO}	— —	— 50 10	nAdc
Emitter Cutoff Current ($V_{EB} = 3.0 \text{ Vdc}, I_C = 0$)		I_{EBO}	—	100	nAdc

1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$; Duty Cycle $\leq 2.0\%$.

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

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit	
ON CHARACTERISTICS						
DC Current Gain ⁽¹⁾ ($I_C = 100\ \mu\text{A}$, $V_{CE} = 10\ \text{V}$) ($I_C = 1.0\ \text{mA}$, $V_{CE} = 10\ \text{V}$) ($I_C = 10\ \text{mA}$, $V_{CE} = 10\ \text{V}$) ($I_C = 150\ \text{mA}$, $V_{CE} = 10\ \text{V}$) ($I_C = 300\ \text{mA}$, $V_{CE} = 10\ \text{V}$) ($I_C = 500\ \text{mA}$, $V_{CE} = 10\ \text{V}$) ($I_C = 150\ \text{mA}$, $V_{CE} = 1.0\ \text{V}$)	MMPQ2222A MMPQ2222A MMPQ2222 MMPQ2222A MMPQ2222 MMPQ2222A MMPQ2222A MMPQ2222A	h_{FE}	35 50 75 75 100 100 30 40 50	— — — — — — — — —	— — — — — 300 — — —	—
Collector–Emitter Saturation Voltage ⁽¹⁾ ($I_C = 150\ \text{mA}$, $I_B = 15\ \text{mA}$) ($I_C = 300\ \text{mA}$, $I_B = 30\ \text{mA}$) ($I_C = 500\ \text{mA}$, $I_B = 50\ \text{mA}$)	MMPQ2222 MMPQ2222A MMPQ2222 MMPQ2222A	$V_{CE(sat)}$	— — — —	— — — —	0.4 0.3 1.6 1.0	Vdc
Base–Emitter Saturation Voltage ⁽¹⁾ ($I_C = 150\ \text{mA}$, $I_B = 15\ \text{mA}$) ($I_C = 300\ \text{mA}$, $I_B = 30\ \text{mA}$) ($I_C = 500\ \text{mA}$, $I_B = 50\ \text{mA}$)	MMPQ2222 MMPQ2222A MMPQ2222 MMPQ2222A	$V_{BE(sat)}$	— — — —	— — — —	1.3 1.2 2.6 2.0	Vdc
DYNAMIC CHARACTERISTICS						
Current–Gain — Bandwidth Product ⁽¹⁾ ($I_C = 20\ \text{mA}$, $V_{CE} = 20\ \text{V}$, $f = 100\ \text{MHz}$)		f_T	200	350	—	MHz
Output Capacitance ($V_{CB} = 10\ \text{V}$, $I_E = 0$, $f = 1.0\ \text{MHz}$)		C_{ob}	—	4.5	—	pF
Input Capacitance ($V_{EB} = 0.5\ \text{V}$, $I_C = 0$, $f = 1.0\ \text{MHz}$)		C_{ib}	—	17	—	pF
SWITCHING CHARACTERISTICS						
Turn–On Time ($V_{CC} = 30\ \text{V}$, $V_{BE(off)} = -0.5\ \text{V}$, $I_C = 150\ \text{mA}$, $I_{B1} = 15\ \text{mA}$)		t_{on}	—	25	—	ns
Turn–Off Time ($V_{CC} = 30\ \text{V}$, $I_C = 150\ \text{mA}$, $I_{B1} = I_{B2} = 15\ \text{mA}$)		t_{off}	—	250	—	ns

 1. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$; Duty Cycle $\leq 2.0\%$.