

**NEC**

NEW ENGLAND SEMICONDUCTOR

NSQ1028

NPN SILICON QUAD SWITCHING TRANSISTOR

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

RATINGS	SYM.	VALUE		UNITS
Collector-Emitter Voltage	V_{CEO}	15		Vdc
Collector-Base Voltage	V_{CBO}	40		Vdc
Emitter-Base Voltage	V_{EBO}	4.5		Vdc
Collector Current -Continuous	I_C	500		mAdc
		Each Transistor	Total Device	
Total Power Dissipation Derate above 25°C	P_D	0.5	1.5	W
		2.86	8.58	$\text{mW}/^{\circ}\text{C}$
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^{\circ}\text{C}$

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

Characteristics	Symbol	Min	Max	Units
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ⁽¹⁾ $I_C = 10 \text{ mAdc}, I_B = 0$	$V_{(BR)CEO}$	15		Vdc
Collector-Base Breakdown Voltage $I_C = 10 \mu\text{Adc}, I_E = 0$	$V_{(BR)CBO}$	40		Vdc
Emitter-Base Breakdown Voltage $I_E = 10 \mu\text{Adc}, I_C = 0$	$V_{(BR)EBO}$	4.5		Vdc
Collector Cutoff Current $V_{CB} = 20 \text{ Vdc}, I_E = 0$	I_{CBO}		0.4	μAdc
Emitter Cutoff Current $V_{BE} = 3.0 \text{ Vdc}, I_C = 0$	I_{EBO}		0.5	μAdc

ON CHARACTERISTICS

DC Current Gain (1) $I_C = 10 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$ $I_C = 100 \text{ mAdc}, V_{CE} = 2.0 \text{ Vdc}$	h_{FE}	40 20		--
Collector-Emitter Saturation Voltage $I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$	$V_{CE(sat)}$		0.25	Vdc
Base-Emitter Saturation Voltage $I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$	$V_{BE(sat)}$		0.9	Vdc

SMALL-SIGNAL CHARACTERISTICS

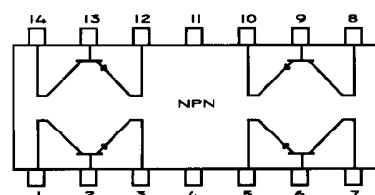
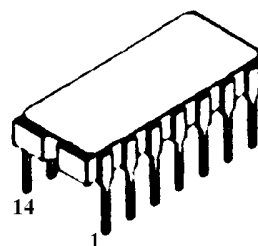
Current-Gain -- Bandwidth Product $I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 100 \text{ MHz}$	f_T	450		MHz
Output Capacitance $V_{CB} = 5.0 \text{ Vdc}, I_E = 0, f = 1 \text{ MHz}$	C_{obo}		4.0	pF
Input Capacitance $V_{BE} = 0.5 \text{ Vdc}, I_C = 0, f = 1 \text{ MHz}$	C_{ibo}		5.0	pF

SWITCHING CHARACTERISTICS

Characteristics	Symbol	Typ.	Units
Turn-On Time $V_{CC} = 3.0 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}, I_C = 10 \text{ mAdc}, I_{B1} = 3.0 \text{ mAdc}$	t_{on}	9.0	ns
Turn-Off Time $V_{CC} = 3.0 \text{ Vdc}, I_C = 10 \text{ mAdc}, I_{B1} = 3.0 \text{ mAdc}, I_{B2} = 1.5 \text{ mAdc}$	t_{off}	15	ns

(1) Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle = 2.0%.

TO-116



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