2N3210 (SILICON)

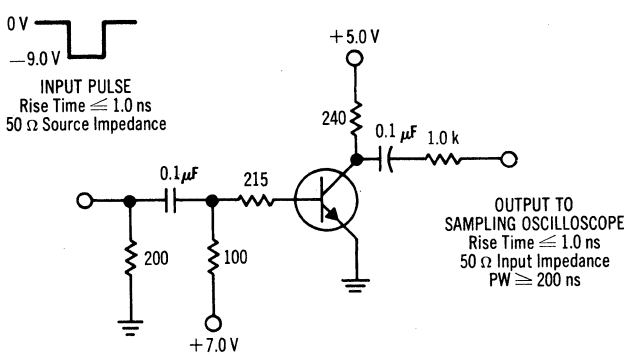
CASE 22
(TO-18)

NPN silicon high frequency switching transistor is designed for high speed, saturated switching applications for industrial service.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage Applicable from 0 to 500 mAdc	V_{CEO}	15	Vdc
Collector-Base Voltage	V_{CB}	40	Vdc
Emitter-Base Voltage	V_{EB}	5.0	Vdc
Collector Current	I_C	500	mAdc
Total Device Dissipation @ T_A = 25°C	P_D	0.36	Watt
Derate above 25°C		2.06	mW/°C
Total Device Dissipation @ T_C = 25°C	P_D	1.2	Watts
Derate above 25°C		6.9	mW/°C
Storage Temperature Range	T_{stg}	-65 to +200	°C

FIGURE 1 — STORAGE TIME TEST CIRCUIT



2N3210 (continued)

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage [1] (I_C = 30 mAdc, I_B = 0)	$BV_{CEO(sus)}$	15	-	Vdc
Collector-Base Breakdown Voltage (I_C = 2.0 μAdc, I_E = 0)	BV_{CBO}	40	-	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	BV_{EBO}	5.0	-	Vdc
Collector Cutoff Current (V_{CE} = 20 Vdc, $V_{EB(off)}$ = 3.0 Vdc)	I_{CEX}	-	25	nAdc
Collector Cutoff Current (V_{CB} = 20 Vdc, I_E = 0) (V_{CB} = 20 Vdc, I_E = 0, T_A = 150°C)	I_{CBO}	- -	0.010 15	μAdc
Emitter Cutoff Current (V_{EB} = 2.0 Vdc, I_C = 0)	I_{EBO}	-	100	nAdc
Base Cutoff Current (V_{CE} = 20 Vdc, $V_{EB(off)}$ = 3.0 Vdc)	I_{BL}	-	0.025	μAdc
ON CHARACTERISTICS				
DC Current Gain [1] (I_C = 10 mAdc, V_{CE} = 1.0 Vdc)	h_{FE}	30	120	-
Collector-Emitter Saturation Voltage (I_C = 20 mAdc, I_B = 2.0 mAdc, T_A = +125°C) (I_C = 200 mAdc, I_B = 20 mAdc)	$V_{CE(sat)}$	- -	0.25 0.75	Vdc
Base-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc) (I_C = 200 mAdc, I_B = 20 mAdc)	$V_{BE(sat)}$	0.7 -	0.8 1.5	Vdc
DYNAMIC CHARACTERISTICS				
Current-Gain - Bandwidth Product (I_C = 20 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	f_T	300	-	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)	C_{ob}	-	6.0	pF
Turn-On Time ($V_{BE(off)} \geq$ 0.2 Vdc, I_C = 200 mAdc, I_{B1} = 40 mAdc) (Figure 2)	t_{on}	-	40	ns
Turn-Off Time (I_C = 200 mAdc, I_{B1} = 40 mAdc, I_{B2} = 20 mAdc) (Figure 2)	t_{off}	-	40	ns
Storage Time ($I_C \approx I_{B1} \approx I_{B2} \approx$ 20 mAdc) (Figure 1)	t_s	-	20	ns

[1] Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

FIGURE 2 — TURN-ON AND TURN-OFF TEST CIRCUIT