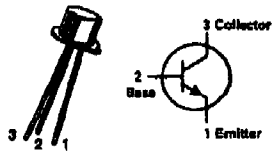
New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

2N2368
2N2369, A
2N3227

2N2369A



SWITCHING TRANSISTORS

NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage 2N2368,9,A / 2N3227	V_{CEO}	15 / 20	Vdc
Collector-Emitter Voltage	V_{CES}	40	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage 2N2369,9,A / 2N3227	V_{EBO}	4.5 / 6.0	Vdc
Collector Current (10 μs pulse)	$I_{C(Peak)}$	500	mA
Collector Current — Continuous 2N2369A, 2N3227	I_C	200	mA
Total Device Dissipation @ T_A = 25°C / Derate above 25°C	P_D	0.36 / 2.06	Watt / mW/°C
Total Device Dissipation @ T_C = 25°C / Derate above 25°C 2N3227	P_D	1.2 / 6.85	Watts / mW/°C
Total Device Dissipation @ T_C = 100°C / Derate above 100°C	P_D	.68 / 6.85	Watts / mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200	°C

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(1) (I_C = 10 mAdc, V_{BE} = 0)	2N3227	$V_{(BR)CEO}$	20	—	Vdc
Collector-Emitter Breakdown Voltage (I_C = 10 μA, V_{BE} = 0)		$V_{(BR)CES}$	40	—	Vdc
Collector-Emitter Sustaining Voltage(1) (I_C = 10 mAdc, I_B = 0)		$V_{CEO(sus)}$	15	—	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μA, I_E = 0)		$V_{(BR)CBO}$	40	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	2N2368, 2N2369, 2N2369A 2N3227	$V_{(BR)EBO}$	4.5 6.0	— —	Vdc
Collector Cutoff Current (V_{CE} = 20 Vdc, V_{BE} = 3.0 Vdc)	2N3227	I_{CEX}	—	0.2	μAdc
Collector Cutoff Current (V_{CB} = 20 Vdc, I_E = 0)	2N2368, 2N2369 2N3227	I_{CBO}	— —	0.4 0.2	μAdc
(V_{CB} = 20 Vdc, I_E = 0, T_A = 150°C)	2N2368, 2N2369, 2N2369A 2N3227		— —	30 50	
Collector Cutoff Current (V_{CE} = 20 Vdc, V_{BE} = 0)	2N2369A	I_{CES}	—	0.4	μAdc
Base Current (V_{CE} = 20 Vdc, V_{BE} = 0)	2N2369A	I_B	—	0.4	μAdc
ON CHARACTERISTICS					
DC Current Gain(1) (I_C = 10 mAdc, V_{CE} = 1.0 Vdc)	2N2368 2N2369 2N2369A 2N3227	h_{FE}	20 40 — 100	60 120 120 300	—
(I_C = 10 mAdc, V_{CE} = 1.0 Vdc, T_A = −55°C)	2N2368 2N2369 2N3227		10 20 40	— — —	
(I_C = 10 mAdc, V_{CE} = 0.35 Vdc, T_A = −55°C) (I_C = 30 mAdc, V_{CE} = 0.4 Vdc)	2N2369A 2N2369A		20 30	— —	

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

Characteristic		Symbol	Min	Max	Unit
(I_C = 100 mAdc, V_{CE} = 1.0 Vdc)	2N2369A		20	—	
	2N3227		30	—	
(I_C = 100 mAdc, V_{CE} = 2.0 Vdc)	2N2368		10	—	
	2N2369		20	—	
Collector-Emitter Saturation Voltage(1)		$V_{CE(sat)}$			Vdc
(I_C = 10 mAdc, I_B = 1.0 mAdc)	2N2368, 2N2369, 2N3227		—	0.25	
	2N2369A		—	0.20	
(I_C = 10 mAdc, I_B = 1.0 mAdc, T_A = +125°C)	2N2369A		—	0.30	
(I_C = 30 mAdc, I_B = 3.0 mAdc)	2N2369A		—	0.25	
(I_C = 100 mAdc, I_B = 10 mAdc)	2N2369A		—	0.50	
	2N3227		—	.45	
Base-Emitter Saturation Voltage(1)		$V_{BE(sat)}$			Vdc
(I_C = 10 mAdc, I_B = 1.0 mAdc)	All Types		0.70	0.85	
(I_C = 10 mAdc, I_B = 1.0 mAdc, T_A = +125°C)	2N2369A		0.60	—	
(I_C = 10 mAdc, I_B = 1.0 mAdc, T_A = −55°C)	2N2369A		—	1.02	
(I_C = 30 mAdc, I_B = 3.0 mAdc)	2N2369A		—	1.15	
(I_C = 100 mAdc, I_B = 10 mAdc)	2N2369A		—	1.60	
	2N3227		0.8	1.4	

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product (I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	2N2368	f_T	400	—	MHz
	2N2369, 2N2369A, 2N3227		500	—	
Output Capacitance (V_{CB} = 5.0 Vdc, I_E = 0, f = 140 kHz)	All Types	C_{obo}	—	4.0	pF
Input Capacitance (V_{EB} = 1.0 Vdc, I_C = 0, f = 140 kHz)	2N3227	C_{ibo}	—	4.0	pF

SWITCHING CHARACTERISTICS

Delay Time	(V_{CC} = 10 V, V_{EB} = 2.0 Vdc, 100 mA, I_{B1} = 10 mA) 2N3227	t_d	—	6.0	ns
Rise Time		t_r	—	18	ns
Storage Time		t_s			ns
(I_C = I_{B1} = 10 mAdc, I_{B2} = −10 mAdc)	2N2368		—	10	
(I_C = 100 mAdc, I_{B1} = I_{B2} = 10 mAdc, V_{CC} = 10 V)	2N2369A		—	13	
	2N3227		—	13	
Fall Time (V_{CC} = 10 V, I_C = 100 mA, I_{B1} = I_{B2} = 10 mA)	2N3227	t_f	—	16	ns
Turn-On Time (I_C = 10 mAdc, I_{B1} = 3.0 mA, I_{B2} = −1.5 mA, V_{CC} = 3.0 Vdc)	All Types	t_{on}	—	12	ns
Turn-Off Time		t_{off}			ns
(I_C = 10 mAdc, I_{B1} = 3.0 mA, I_{B2} = −1.5 mA, V_{CC} = 3.0 Vdc)	2N2368		—	—	
	2N2369,		—	—	
	2N2369A,		—	15	
	2N3227		—	18	
Total Control Charge (I_C = 10 mA, I_B = 1.0 mA, V_{CC} = 3.0 V)	2N3227	Q_T	—	50	pC

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.