

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

TELEPHONE: (201) 376-2922
 (212) 227-6005
 FAX: (201) 376-8960

2N3644 • 2N3645 • PN3644 • PN3645

PNP SMALL SIGNAL GENERAL PURPOSE AMPLIFIERS AND SWITCHES

ABSOLUTE MAXIMUM RATINGS

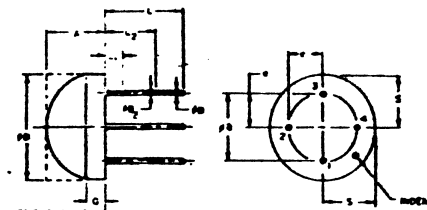
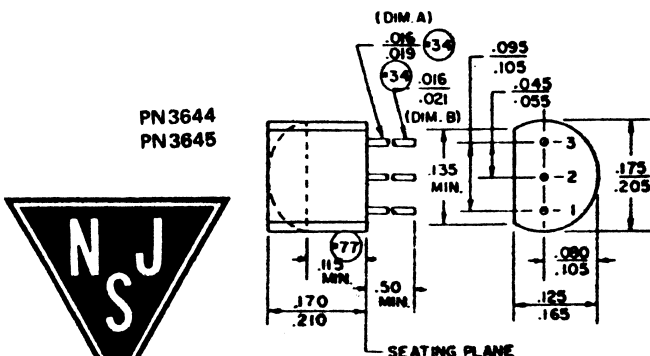
	2N3644/45	PN3644/45
Maximum Temperatures		
Storage Temperature	-55°C to +125°C	-55°C to +150°C
Operating Junction Temperature	125°C	150°C
Lead Temperature (10 seconds)	260°C	260°C
Maximum Power Dissipation (Notes 2 & 3)		
Total Dissipation at 25°C Case Temperature	0.07 W	1.0 W
at 25°C Ambient Temperature	0.3 W	0.625 W
Maximum Voltages and Current	2N/PN3645	2N/PN3644
V _{CB0} Collector to Base Voltage	-60 V	-45 V
V _{CE0} Collector to Emitter Voltage (Note 4)	-60 V	-45 V
V _{EB0} Emitter to Base Voltage	-5.0 V	-5.0 V
I _C Collector Current	500 mA	500 mA

ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)

SYMBOL	CHARACTERISTIC	2N3644 PN3644		2N3645 PN3645		UNITS	TEST CONDITIONS
		MIN.	MAX.	MIN.	MAX.		
h _{FE}	DC Current Gain	40	80	40	80		I _C = 100 μA, V _{CE} = -10 V I _C = 1.0 mA, V _{CE} = -10 V
h _{FE}	DC Pulse Current Gain	100	240	100	300		I _C = 10 mA, V _{CE} = -10 V I _C = 50 mA, V _{CE} = 1.0 V I _C = 150 mA, V _{CE} = -10 V I _C = 300 mA, V _{CE} = -2.0 V
h _{fe}	High Frequency Current Gain	2.0	2.0	2.0	2.0		I _C = 20 mA, V _{CE} = -20 V, f = 100 MHz
C _{ob}	Output Capacitance		8.0		8.0	pF	I _E = 0, V _{CB} = -10 V, f = 140 kHz
C _{ib}	Input Capacitance		35		35	pF	I _C = 0, V _{EB} = -0.5 V, f = 140 kHz
V _{CE(sat)}	Pulsed Collector Saturation Voltage		-0.25		-0.25	V	I _C = 50 mA, I _B = 2.5 mA
			-0.4		-0.4	V	I _C = 150 mA, I _B = 15 mA
			-1.0		-1.0	V	I _C = 300 mA, I _B = 30 mA
V _{CEO(sus)}	Collector to Emitter Sustaining Voltage	-45		-60		V	I _C = 10 mA (pulsed), I _B = 0
V _{BE(sat)}	Pulsed Base		-1.0		-1.0	V	I _C = 50 mA, I _B = 2.5 mA
			-1.3		-1.3	V	I _C = 150 mA, I _B = 15 mA
			-2.0		-2.0	V	I _C = 300 mA, I _B = 30 mA
V _{VEBO}	Emitter to Base Breakdown Voltage	-5.0		-5.0		V	I _C = 0, I _E = 10 μA
V _{VCB0}	Collector to Base Breakdown Voltage	-45		-60		V	I _C = 100 μA, I _E = 0
t _{on}	Turn On Time		40		40	ns	I _C ≈ 300 mA, I _{B1} ≈ 30 mA, V _{CC} = -30 V
t _{off}	Turn Off Time		100		100	ns	I _C ≈ 300 mA, I _{B1} ≈ I _{B2} ≈ 30 mA, V _{CE} = -30 V
I _{CS}	Collector Reverse Current		35		35	nA	V _{CE} = -30 V, V _{BE} = 0
			2.0		2.0	μA	V _{CE} = -50 V, V _{BE} = 0
						μA	V _{CE} = -30 V, V _{BE} = 0, T _A = 65°C
						μA	V _{CE} = -50 V, V _{BE} = 0, T _A = 65°C

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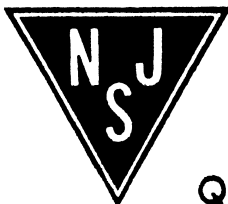
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ALL DIMENSIONS ARE GIVEN FROM BASE UNLESS OTHERWISE NOTED

SYMBOL	INCHES		MILLIMETERS		DIA.
	MIN.	MAX.	MIN.	MAX.	
A	.122	.200	3.1	5.1	0.0
B	.190	.210	4.83	5.33	1.2
C	.016	.021	.407	.533	1.2
D	.016	.019	.407	.482	1.2
E	.300	.325	7.75	8.25	1.2
F	.300	.310	7.75	7.95	1.2
G	.500	...	12.70	...	1.2
H	.750	.800	19.05	20.32	1.2
I	.000	...	0.00	...	1.2
J	.000	...	0.00	...	1.2
K	.100	...	2.54	...	1.2

Quality Semi-Conductors



2N3639 • 2N3640 • MPS3639 • MPS3640

ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted) (Cont'd)

SYMBOL	CHARACTERISTIC	2N3639		2N3640		UNITS	TEST CONDITIONS
		MIN.	MAX.	MIN.	MAX.		
C _{ob}	Output Capacitance		3.5	3.5		pF	I _E = 0, V _{CB} = -5.0 V, f = 140 kHz
			5.5	5.5			
C _{ib}	Input Capacitance		3.5	3.5		pF	I _E = 0, V _{CB} = 0, f = 140 kHz
BV _{CB0}	Collector to Base Breakdown Voltage	-6.0		-12		V	I _C = 0, V _{EB} = -0.5 V, f = 140 kHz I _C = 100 μA, I _E = 0
BV _{CES}	Collector to Emitter Breakdown Voltage	-6.0		-12		V	I _C = 100 μA, V _{BE} = 0
V _{CEO(sus)}	Collector to Emitter Sustaining Voltage (Note 4)	-6.0		-12		V	I _C = 10 mA, I _B = 0
BVEBO	Emitter to Base Breakdown Voltage	-4.0		-4.0		V	I _E = 100 μA, I _C = 0

SYMBOL	CHARACTERISTIC	MPS3639		MPS3640		UNITS	TEST CONDITIONS
		MIN.	MAX.	MIN.	MAX.		
t _{on}	Turn on Time (see test circuit no. 235) (see test circuit no. 219)		25	25		ns	I _C ≈ 50 mA, I _{B1} ≈ 5.0 mA, V _{CC} = 6.0 V
			60	60			
t _{off}	Turn Off Time (see test circuit no. 235) (see test circuit no. 219)		25	35		ns	I _C ≈ 10 mA, I _{B1} ≈ 0.5 mA, V _{CC} = -1.5 V
			60	75			
h _{fe}	High Frequency Current Gain	3.0		5.0			I _C = 10 mA, V _{CB} = 0, f = 100 MHz
h _{FE}	DC Pulse Current Gain (Note 4)	30	120	30	120		I _C = 10 mA, V _{CE} = -0.3 V
		20		20			I _C = 50 mA, V _{CE} = -1.0 V
V _{CE(sat)}	Collector to Emitter Saturation Voltage (Note 4)		-0.16	-0.2		V	I _C = 10 mA, I _B = 1.0 mA,
			-0.5	-0.6		V	I _C = 50 mA, I _B = 5.0 mA
			-0.23	-0.25		V	I _C = 10 mA, I _B = 1.0 mA, T _A = 65°C
V _{BE(sat)}	Base Saturation Voltage (Note 4)	-0.75	-0.95	-0.75	-0.95	V	I _C = 10 mA, I _B = 0.5 mA
		-0.8	-1.0	-0.8	-1.0	V	I _C = 10 mA, I _B = 1.0 mA
			1.5	1.5		V	I _C = 50 mA, I _B = 5.0 mA
I _{CS}	Collector Reverse Current		10			nA	V _{CE} = -3.0 V, V _{BE} = 0
				10		nA	V _{CE} = -6.0 V, V _{BE} = 0
			1.0			μA	V _{CE} = -3.0 V, V _{BE} = 0, T _A = 65°C
				1.0		μA	V _{CE} = -6.0 V, V _{BE} = 0, T _A = 65°C
C _{ob}	Output Capacitance		3.5	3.5		pF	I _E = 0, V _{CB} = -5.0 V, f = 140 kHz
C _{ib}	Input Capacitance		3.5	3.5		pF	I _C = 0, V _{EB} = -0.5 V, f = 140 kHz
BV _{CB0}	Collector to Base Breakdown Voltage	-6.0		-12		V	I _C = 100 μA, I _E = 0
BV _{CES}	Collector to Emitter Breakdown Voltage	-6.0		-12		V	I _C = 100 μA, V _{BE} = 0
V _{CEO(sus)}	Collector to Emitter Sustaining Voltage (Note 4)	-6.0		-12		V	I _C = 10 mA, I _B = 0
BVEBO	Emitter to Base Breakdown Voltage	-4.0		-4.0		V	I _E = 100 μA, I _C = 0