

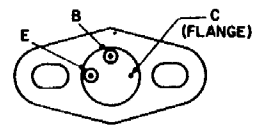
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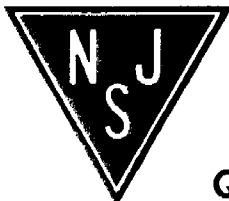
## 2N3439; 2N3440; 2N4063; 2N4064; 40385; 40346, V1, V2; 40390; 40412, V1, V2 High-Voltage Silicon N-P-N Transistors

	2N3439	2N3440	40346	40412	
	2N4063	2N4064	40346V1	40412V1	
	40385	40390	40346V2	40412V2	
<b>MAXIMUM RATINGS, Absolute-Maximum Values:</b>					
*COLLECTOR-TO-BASE VOLTAGE . . . . . $V_{CB0}$	450	300	—	—	V
COLLECTOR-TO-EMITTER VOLTAGE:					
With external base-to-emitter resistance					
( $R_{BE}$ ) = 1,000 $\Omega$ . . . . . $V_{CER(sus)}$	—	—	175	—	V
= 10,000 $\Omega$ . . . . . $V_{CER(sus)}$	—	—	—	250	V
* With base open . . . . . $V_{CEO(sus)}$	350	250	—	—	V
*EMITTER-TO-BASE VOLTAGE . . . . . $V_{EBO}$	7	7	—	—	V
*CONTINUOUS COLLECTOR CURRENT . . . . . $I_C$	1	1	1	1	A
*CONTINUOUS BASE CURRENT . . . . . $I_B$	0.5	0.5	0.5	0.5	A
TRANSISTOR DISSIPATION: $P_T$					
At case temperature up to 25°C . . . . .	10	10(2N3440)	10(40346)	10(40412)	W
At free-air temperatures up to 25°C . . . . .	1(40385)	10(2N4064)	10(40346V2)	10(40412V2)	W
At free-air temperatures up to 50°C . . . . .	1(2N3439)	3.5(40390)	4(40346V1)	4(40412V1)	W
At free-air temperatures above 25°C or 50°C		1(2N3440)	1(40346)	1(40412)	W
		Derate linearly to 200°C			°C
*TEMPERATURE RANGE:					
Storage & Operating (Junction) . . . . .	—65 to 200			°C	
*LEAD TEMPERATURE (During soldering):					
At distances $\geq$ 1/32 in (0.79 mm)	—			—	
from seating plane for 10 s max. . . . .	—			255 °C	



JEDEC TO-39 with Flange  
2N4063, 2N4064, 40346V2,  
40412V2

\*2N-Series types in accordance with JEDEC registration data  
NOTE:  $P_T$  value of 10 W at  $T_C = 25^\circ\text{C}$  and lead temperature of 265°C are registered data for 2N4063 and 2N4064 only.



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

**Quality Semi-Conductors**

**2N3439; 2N3440; 2N4063; 2N4064; 40385;  
40346, V1, V2; 40390; 40412, V1, V2**

ELECTRICAL CHARACTERISTICS, Case Temperature ( $T_C$ ) = 25°C, Unless Otherwise Specified

CHARACTERISTICS	SYMBOL	VOLTAGE		CURRENT	LIMITS								UNITS
		V dc			mA dc	2N3439 2N4063 40385		2N3440 2N4064 40390		40346 40346V1 40346V2		40412 40412V1 40412V2	
		$V_{CE}$	$V_{BE}$	$I_C$		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	
Collector-Cutoff Current: With base open	$I_{CEO}$	100 200 300	—		—	—	—	—	—	5	—	5	$\mu A$
With base reverse-biased:	$I_{CEV}$	200 300 450	— 1.5 — 1.5 — 1.5		—	—	—	—	—	10	—	—	
At $T_C = 150^\circ C$		150 200	— 1.5 — 1.5		—	—	—	—	—	—	—	2	
With $R = 10,000$ ohms	$I_{CER}$	100			—	—	—	—	—	—	—	1	mA
Emitter-Cutoff Current	$I_{EBO}$		— 3 — 4 — 6		—	—	—	—	—	—	—	100	$\mu A$
DC Forward-Current Transfer Ratio	$h_{FE}$	10 10 10 20		2 10 20 30	30 — 40 —	— — 160 —	— — 40 —	— — 160 —	— — — —	— — — —	— — — 40	—	
Collector-to-Emitter Sustaining Voltage: With base open	$V_{CEO(sus)}$			50	350 <sup>a</sup>	—	250 <sup>a</sup>	—	—	—	—	—	V
Collector-to-Emitter Sustaining Voltage: With external base-to- emitter resistance $R_{BE} = 1,000$ ohms	$V_{CER(sus)}$			50	—	—	—	—	175 <sup>a</sup>	—	—	—	
$R_{BE} = 10,000$ ohms	$V_{CER(sus)}$			50	—	—	—	—	—	—	250 <sup>a</sup>	—	
Base-to-Emitter Voltage	$V_{BE}$	10		10	—	—	—	—	—	1	—	—	V
Base-to-Emitter Saturation Voltage $I_B = 4$ mA	$V_{BE(sat)}$			50	—	1.3	—	1.3	—	—	—	—	V
Collector-to-Emitter Saturation Voltage $I_B = 1$ mA $I_B = 4$ mA	$V_{CE(sat)}$			10 50	— —	— 0.5	— —	— 0.5	— —	0.5 —	— —	0.5 —	V
Small-Signal Forward- Current Transfer Ratio: $f = 5$ MHz	$h_{fe}$	10		10	3	—	3	—	2	—	2	—	
Output Capacitance: $V_{CB} = 10$ V, $f = 1$ MHz	$C_{ob}$				—	10	—	10	—	10	—	10	pF
Second-Breakdown Current	$I_{S/b}$	200			—	—	—	—	—	—	50	—	mA
Thermal Resistance: Junction-to-case	$R_{\theta JC}$				—	17.5	—	17.5	—	15 max. (40346) (40346V2)	15 max. (40412) (40412V2)	—	$^\circ C/W$
Junction-to-free air	$R_{\theta JFA}$				—	—	—	—	—	45 max. (40346V1)	45 max. (40412V1)	—	

<sup>a</sup>2N-Series types in accordance with JEDEC registration data

<sup>b</sup>CAUTION: The sustaining voltages,  $V_{CEO(sus)}$  and  $V_{CER(sus)}$ , MUST NOT be measured on a curve tracer