

**Silicon NPN Power Transistor**

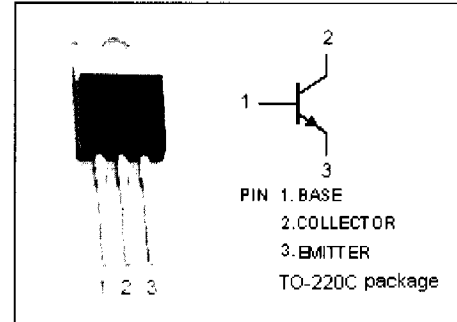
**2SC3039**

**DESCRIPTION**

- Collector-Emitter Breakdown Voltage:  
 $V_{(BR)CEO} = 400V(\text{Min})$
- Fast Switching Speed
- Wide Area of Safe Operation

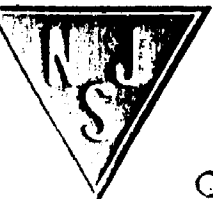
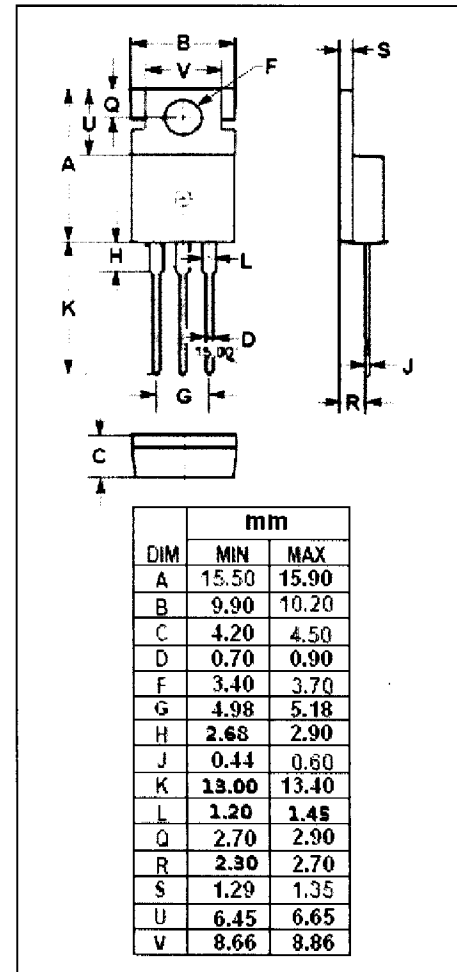
**APPLICATIONS**

- Designed for switching regulator applications.



**ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )**

SYMBOL	PARAMETER	VALUE	UNIT
$V_{CBO}$	Collector-Base Voltage	500	V
$V_{CEO}$	Collector-Emitter Voltage	400	V
$V_{EBO}$	Emitter-Base Voltage	7	V
$I_C$	Collector Current-Continuous	7	A
$I_{CM}$	Collector Current-Peak	14	A
$I_B$	Base Current-Continuous	3	A
$P_C$	Collector Power Dissipation @ $T_c = 25^\circ\text{C}$	50	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature Range	-55~150	$^\circ\text{C}$



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# Silicon NPN Power Transistor

# 2SC3039

## ELECTRICAL CHARACTERISTICS

$T_C=25^\circ\text{C}$  unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C=5\text{mA}; R_{BE}=\infty$	400			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage,	$I_C=1\text{mA}; I_E=0$	500			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E=1\text{mA}; I_C=0$	7			V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=4\text{A}; I_B=0.8\text{A}$			1.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=4\text{A}; I_B=0.8\text{A}$			1.5	V
$I_{CBO}$	Collector Cutoff Current	$V_{CB}=400\text{V}; I_E=0$			10	$\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current	$V_{EB}=5\text{V}; I_C=0$			10	$\mu\text{A}$
$h_{FE-1}$	DC Current Gain	$I_C=0.8\text{A}; V_{CE}=5\text{V}$	15		50	
$h_{FE-2}$	DC Current Gain	$I_C=4\text{A}; V_{CE}=5\text{V}$	8			
$f_T$	Current-Gain—Bandwidth Product	$I_C=0.8\text{A}; V_{CE}=10\text{V}$		20		MHz
$C_{OB}$	Output Capacitance	$V_{CB}=10\text{V}; f_{test}=1.0\text{MHz}$		80		pF

### Switching times

$t_{on}$	Turn-on Time	$I_C=5\text{A}, I_{B1}=-I_{B2}=1\text{A};$ $R_L=40\Omega; V_{CC}=200\text{V}$			1.0	$\mu\text{s}$
$t_{stg}$	Storage Time				2.5	$\mu\text{s}$
$t_f$	Fall Time				1.0	$\mu\text{s}$

### ◆ $h_{FE-1}$ Classifications

L	M	N
15-30	20-40	30-50