

isc Silicon NPN Power Transistor

MJ13331

DESCRIPTION

- Collector-Emitter Sustaining Voltage-
: $V_{CEO(SUS)} = 250V(\text{Min})$
- High Switching Speed

APPLICATIONS

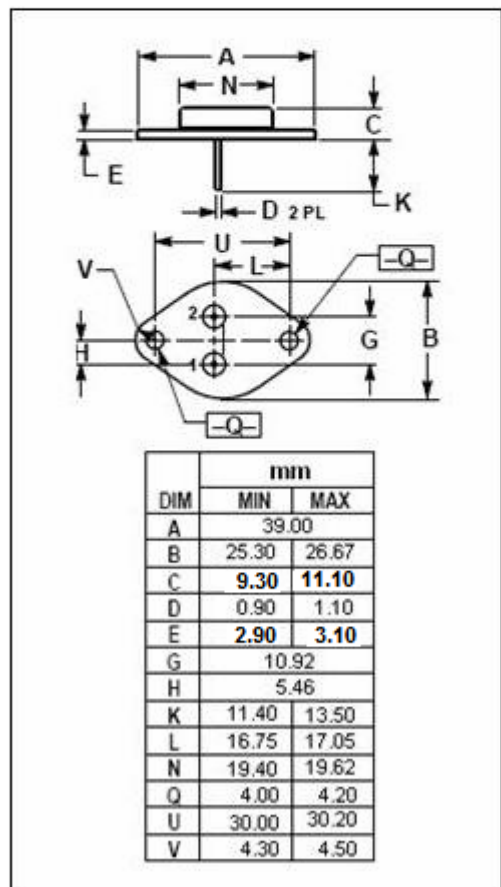
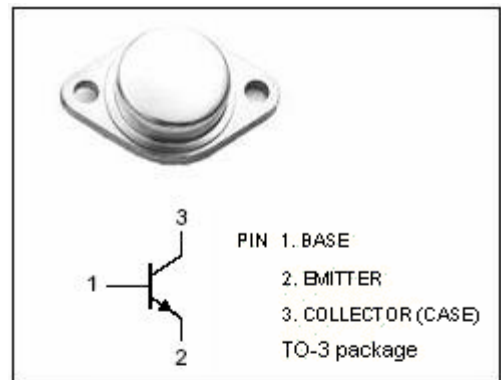
- Designed for high-voltage ,high-speed, power switching in inductive circuits where fall time is critical. They are particularly suited for line operated switch-mode applications.
Typical applications:
- Switching regulators
- Inverters
- Solenoid and relay drivers
- Motor controls
- Deflection circuits

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

SYMBOL	PARAMETER	VALUE	UNIT
V_{CEV}	Collector-Emitter Voltage	450	V
V_{CEO}	Collector-Emitter Voltage	250	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current-Continuous	20	A
I_{CM}	Collector Current-Peak	30	A
I_B	Base Current-Continuous	10	A
I_{BM}	Base Current-Peak	20	A
P_C	Collector Power Dissipation@ $T_C=25^\circ\text{C}$	175	W
T_J	Junction Temperature	200	$^\circ\text{C}$
T_{stg}	Storage Temperature	-65~200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	MAX	UNIT
$R_{th\ j-c}$	Thermal Resistance,Junction to Case	1.0	$^\circ\text{C/W}$



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ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage	$I_C=100\text{mA}$; $I_B=0$	250			V
$V_{CE(sat)-1}$	Collector-Emitter Saturation Voltage	$I_C=10\text{A}$; $I_B=1.5\text{A}$ $I_C=10\text{A}$; $I_B=1.8\text{A}$, $T_C=100^{\circ}\text{C}$			1.5 2.5	V
$V_{CE(sat)-2}$	Collector-Emitter Saturation Voltage	$I_C=20\text{A}$; $I_B=5\text{A}$			3.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=10\text{A}$; $I_B=1.5\text{A}$ $I_C=10\text{A}$; $I_B=1.8\text{A}$, $T_C=100^{\circ}\text{C}$			1.8 1.8	V
I_{CEV}	Collector Cutoff Current	$V_{CEV}=450\text{V}$; $V_{BE(off)}=1.5\text{V}$ $V_{CEV}=450\text{V}$; $V_{BE(off)}=1.5\text{V}$; $T_C=150^{\circ}\text{C}$			0.25 5.0	mA
I_{CER}	Collector Cutoff Current	$V_{CE}=450\text{V}$; $R_{BE}=50\Omega$; $T_C=100^{\circ}\text{C}$			5.0	mA
I_{EBO}	Emitter Cutoff Current	$V_{EB}=6\text{V}$; $I_C=0$			0.5	mA
h_{FE-1}	DC Current Gain	$I_C=5\text{A}$; $V_{CE}=5\text{V}$	15		75	
h_{FE-2}	DC Current Gain	$I_C=10\text{A}$; $V_{CE}=5\text{V}$	8			
f_T	Current Gain-Bandwidth Product	$I_C=0.3\text{A}$; $V_{CE}=10\text{V}$; $f_{test}=1\text{MHz}$	5		40	
C_{OB}	Output Capacitance	$I_E=0$; $V_{CB}=10\text{V}$; $f_{test}=100\text{kHz}$	100		400	pF

Switching times; Resistive Load

t_d	Delay Time	$I_C=10\text{A}$, $V_{CC}=175\text{V}$; $I_{B1}=1.5\text{A}$ $V_{BE(off)}=5\text{V}$; $t_p=50\mu\text{s}$; Duty Cycle $\leq 2.0\%$		0.08	0.2	μs
t_r	Rise Time			0.55	1.0	μs
t_s	Storage Time			0.7	3.5	μs
t_f	Fall Time			0.11	0.7	μs