

**INCHANGE Semiconductor**

**isc Product Specification**

**isc Silicon NPN Power Transistor**

**BUX48**

**DESCRIPTION**

- High Voltage Capability
- High Current Capability
- Fast 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 swtchmode applications such as:

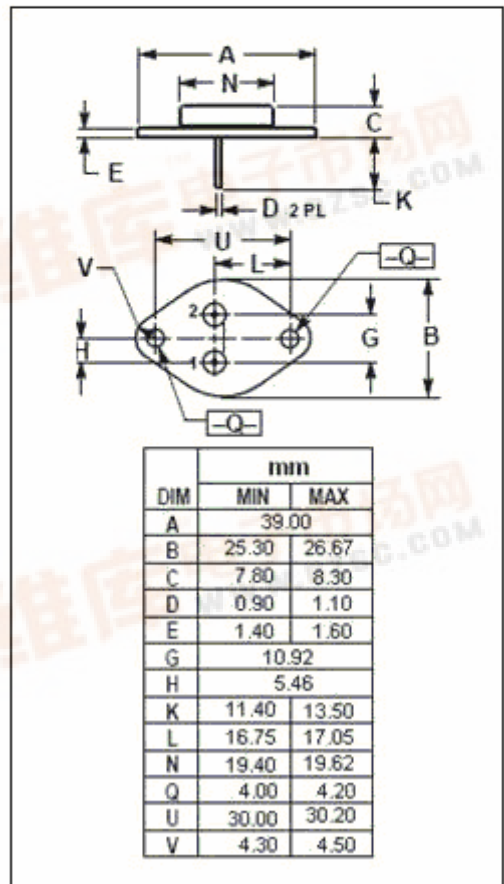
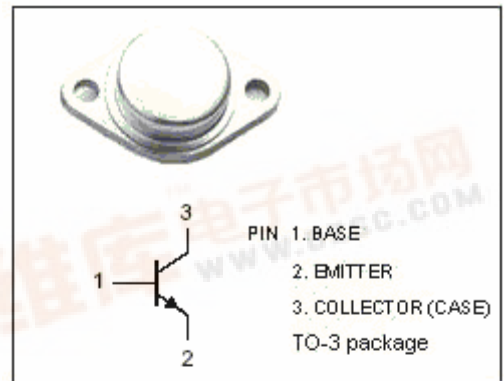
- Switching regulators
- Inverters
- Solenoid and relay drivers
- Motor controls
- Deflection circuits

**Absolute maximum ratings(Ta=25°C)**

SYMBOL	PARAMETER	VALUE	UNIT
V <sub>CEX</sub>	Collector-Emitter Voltage (V <sub>BE</sub> = -1.5V)	850	V
V <sub>CEO</sub>	Collector-Emitter Voltage	400	V
V <sub>EBO</sub>	Emitter-Base Voltage	7	V
I <sub>C</sub>	Collector Current-Continuous	15	A
I <sub>CM</sub>	Collector Current-Peak	30	A
I <sub>B</sub>	Base Current-Continuous	4	A
I <sub>BM</sub>	Base Current-peak	20	A
P <sub>C</sub>	Collector Power Dissipation @T <sub>C</sub> =25°C	175	W
T <sub>j</sub>	Junction Temperature	200	°C
T <sub>stg</sub>	Storage Temperature Range	-65~200	°C

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	MAX	UNIT
R <sub>th j-c</sub>	Thermal Resistance,Junction to Case	1.0	°C/W



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## ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage	$I_C=0.2\text{A}$ ; $I_B=0$ ; $L=25\text{mH}$	400		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E=50\text{mA}$ ; $I_C=0$	7		V
$V_{CE(sat)-1}$	Collector-Emitter Saturation Voltage	$I_C=10\text{A}$ ; $I_B=2\text{A}$ $I_C=10\text{A}$ ; $I_B=2\text{A}$ ; $T_C=100^{\circ}\text{C}$		1.5 2.0	V
$V_{CE(sat)-2}$	Collector-Emitter Saturation Voltage	$I_C=15\text{A}$ ; $I_B=3\text{A}$		5.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=10\text{A}$ ; $I_B=2\text{A}$ $I_C=10\text{A}$ ; $I_B=2\text{A}$ ; $T_C=100^{\circ}\text{C}$		1.6 1.6	V
$I_{CER}$	Collector Cutoff Current	$V_{CE}=\text{rated } V_{CER}$ ; $R_{BE}=10\ \Omega$ $V_{CE}=\text{rated } V_{CER}$ ; $R_{BE}=10\ \Omega$ ; $T_C=125^{\circ}\text{C}$		0.5 4	mA
$I_{CEX}$	Collector Cutoff Current	$V_{CE}=\text{rated } V_{CES}$ ; $V_{BE(off)}=1.5\text{V}$ $V_{CE}=\text{rated } V_{CES}$ ; $V_{BE(off)}=1.5\text{V}$ ; $T_C=125^{\circ}\text{C}$		0.2 2	mA
$I_{EBO}$	Emitter Cutoff Current	$V_{EB}=5\text{V}$ ; $I_C=0$		0.1	mA
$h_{FE}$	DC Current Gain	$I_C=10\text{A}$ ; $V_{CE}=5\text{V}$	8		
$C_{OB}$	Output Capacitance	$I_E=0$ ; $V_{CB}=10\text{V}$ , $f_{\text{test}}=1\text{MHz}$		350	pF

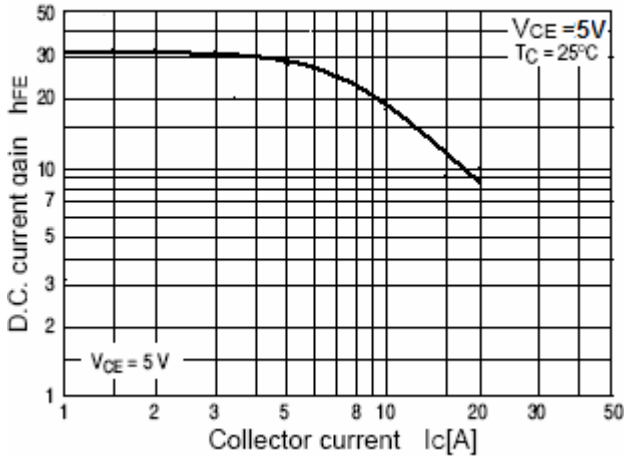
Switching times Resistive Load

$t_{on}$	Turn-on Time	$I_C=10\text{A}$ ; $I_{B1}=-I_{B2}=2\text{A}$ ; $V_{CC}=300\text{V}$ $V_{BE(off)}=5\text{V}$ , Duty Cycle $\leq 2\%$		0.9	$\mu\text{s}$
$t_s$	Storage Time			2.0	$\mu\text{s}$
$t_f$	Fall Time			0.4	$\mu\text{s}$

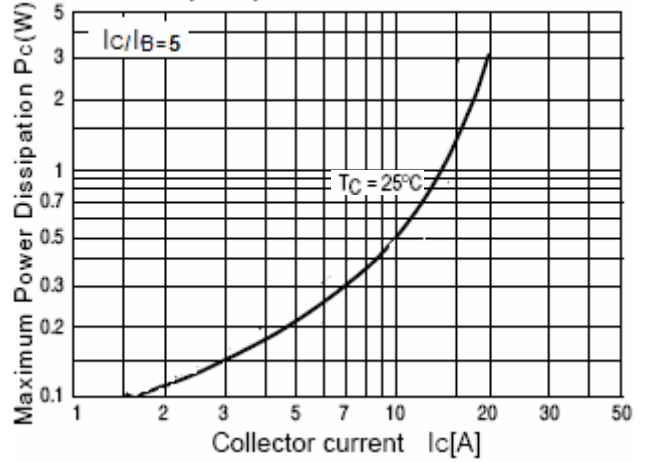
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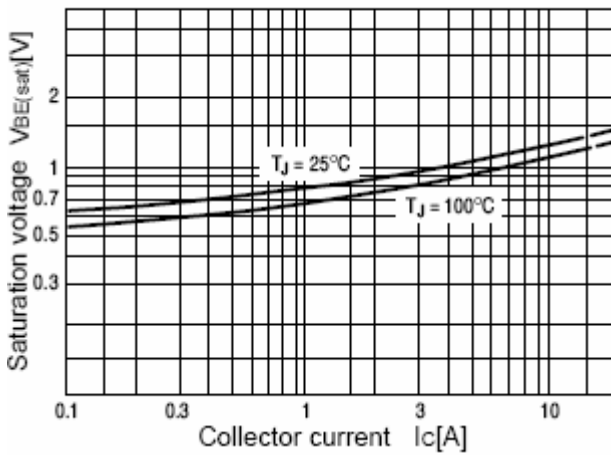
$h_{FE}-I_C$  Characteristics



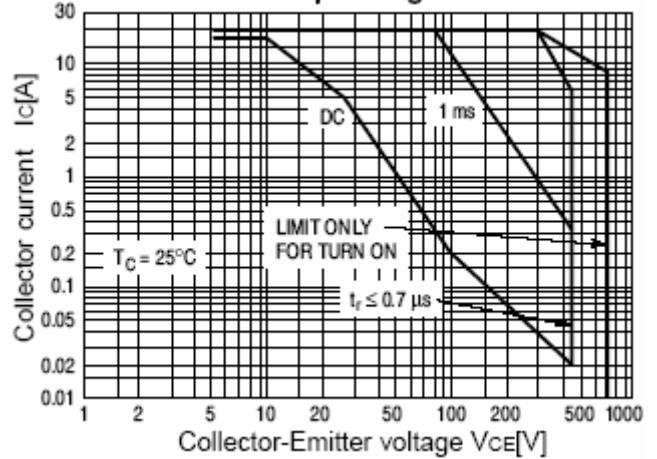
$V_{CE(sat)}-I_C$  Characteristics



$V_{BE(sat)}-I_C$  Characteristics



Safe Operating Area



Power Derating

