

INCHANGE Semiconductor

isc Product Specification

isc Silicon NPN Power Transistors

MJ13090/13091

DESCRIPTION

- Collector-Emitter Sustaining Voltage-
: $V_{CE0(SUS)} = 400V(\text{Min})$ —MJ13090
= $450V(\text{Min})$ —MJ13091
- High Switching Speed

APPLICATIONS

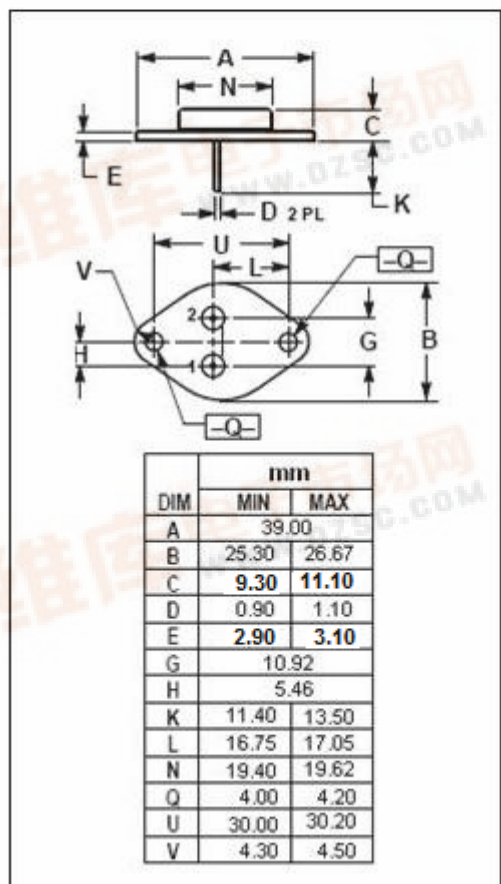
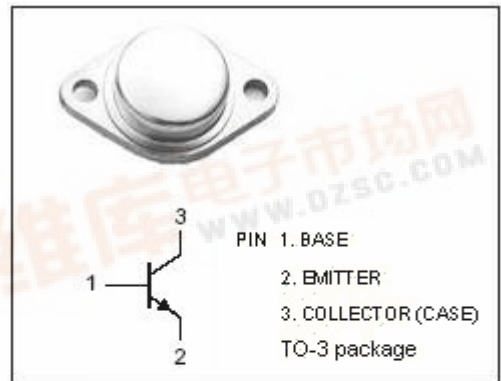
- Designed for high-voltage ,high-speed, power switching in inductive circuits where fall time is critical. They are particularly suited for line operated switch-mode applications.
Typical applications:
- Switching regulators
- Inverters
- Solenoid and relay drivers
- Motor controls
- Deflection circuits

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

SYMBOL	PARAMETER	VALUE	UNIT	
V_{CEV}	Collector-Emitter Voltage	MJ13090	650	V
		MJ13091	750	
$V_{CE0(SUS)}$	Collector-Emitter Voltage	MJ13090	400	V
		MJ13091	450	
V_{EBO}	Emitter-Base Voltage	6	V	
I_C	Collector Current-Continuous	15	A	
I_{CM}	Collector Current-Peak	20	A	
I_B	Base Current-Continuous	5	A	
I_{BM}	Base Current-Peak	10	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	MJ13090	$I_C=100\text{mA}; I_B=0$	400			V
		MJ13091		450			
$V_{CE(sat)-1}$	Collector-Emitter Saturation Voltage		$I_C=10\text{A}; I_B=2\text{A}$ $I_C=10\text{A}; I_B=2\text{A}; T_C=100^{\circ}\text{C}$			1.0 2.0	V
$V_{CE(sat)-2}$	Collector-Emitter Saturation Voltage		$I_C=15\text{A}; I_B=3\text{A}$			3.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage		$I_C=10\text{A}; I_B=2\text{A}$ $I_C=10\text{A}; I_B=2\text{A}; T_C=100^{\circ}\text{C}$			1.5 1.5	V
I_{CEV}	Collector Cutoff Current	MJ13090	$V_{CEV}=650\text{V}; V_{BE(off)}=1.5\text{V}$ $V_{CEV}=650\text{V}; V_{BE(off)}=1.5\text{V}; T_C=100^{\circ}\text{C}$			0.5 2.5	mA
		MJ13091		$V_{CEV}=750\text{V}; V_{BE(off)}=1.5\text{V}$ $V_{CEV}=750\text{V}; V_{BE(off)}=1.5\text{V}; T_C=100^{\circ}\text{C}$			
I_{CER}	Collector Cutoff Current	MJ13090	$V_{CE}=650\text{V}; R_{BE}=50\Omega, T_C=100^{\circ}\text{C}$			3.0	mA
		MJ13091		$V_{CE}=750\text{V}; R_{BE}=50\Omega, T_C=100^{\circ}\text{C}$			
I_{EBO}	Emitter Cutoff Current		$V_{EB}=6\text{V}; I_C=0$			1.0	mA
h_{FE}	DC Current Gain		$I_C=10\text{A}; V_{CE}=3\text{V}$	8			
C_{OB}	Output Capacitance		$I_E=0; V_{CB}=10\text{V}; f_{test}=1.0\text{kHz}$			350	pF

Switching times; Resistive Load

t_d	Delay Time	$I_C=10\text{A}, V_{CC}=250\text{V};$ $I_{B1}=1.25\text{A}; t_p=30\mu\text{s}; V_{BE(off)}=5\text{V}$ Duty Cycle $\leq 2.0\%$		30	50	ns
t_r	Rise Time			130	500	ns
t_s	Storage Time			550	2500	ns
t_f	Fall Time			100	500	ns