

**SPTECH Silicon NPN Power Transistor**

**BUL38D**

**DESCRIPTION**

- Collector–Emitter Sustaining Voltage  
:  $V_{CEO(SUS)} = 450V(\text{Min.})$
- Collector Saturation Voltage  
:  $V_{CE(sat)} = 0.5V(\text{Max}) @ I_C = 1.0A$
- Very High Switching Speed

**APPLICATIONS**

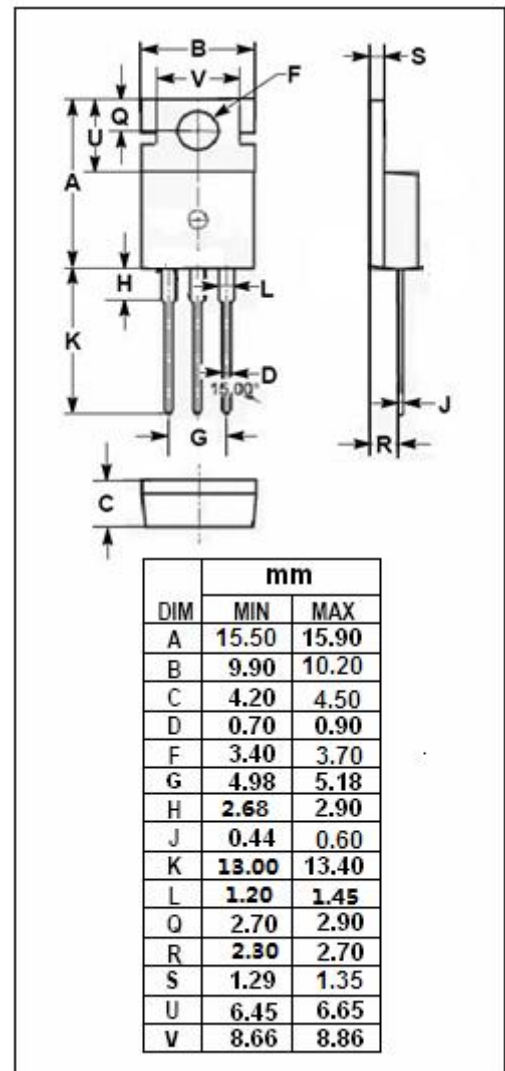
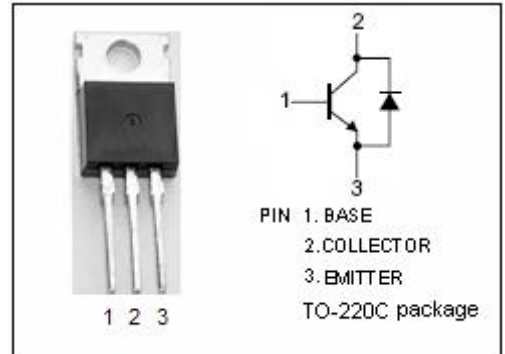
- Designed for use in lighting applications and low cost switch-mode power supplies

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

SYMBOL	PARAMETER	VALUE	UNIT
$V_{CES}$	Collector-Emitter Voltage	800	V
$V_{CEO}$	Collector-Emitter Voltage	450	V
$V_{EBO}$	Emitter-Base Voltage	9	V
$I_C$	Collector Current-Continuous	5	A
$I_{CM}$	Collector Current-peak $t_p < 5\text{ms}$	10	A
$I_B$	Base Current-Continuous	2	A
$I_{BM}$	Base Current-peak $t_p < 5\text{ms}$	4	A
$P_C$	Collector Power Dissipation $T_C=25^\circ\text{C}$	80	W
$T_i$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature Range	-65~150	$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	MAX	UNIT
$R_{th\ j-c}$	Thermal Resistance, Junction to Case	1.56	$^\circ\text{C/W}$
$R_{th\ j-a}$	Thermal Resistance, Junction to Ambient	62.5	$^\circ\text{C/W}$



**ELECTRICAL CHARACTERISTICS**

T<sub>C</sub> =25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V <sub>CEO(SUS)</sub>	Collector-Emitter Sustaining Voltage	I <sub>C</sub> = 50mA; I <sub>B</sub> =0	450			V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage	I <sub>E</sub> = 10mA; I <sub>C</sub> = 0	9			V
V <sub>CE(sat)-1</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 1A; I <sub>B</sub> = 0.2A			0.5	V
V <sub>CE(sat)-2</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 2A; I <sub>B</sub> = 0.4A			0.7	V
V <sub>CE(sat)-3</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 4A; I <sub>B</sub> = 0.75A			1.1	V
V <sub>BE(sat)-1</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 1A; I <sub>B</sub> = 0.2A			1.1	V
V <sub>BE(sat)-2</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 2A; I <sub>B</sub> = 0.4A			1.2	V
I <sub>CEs</sub>	Collector Cutoff Current	V <sub>CE</sub> = 800V; V <sub>BE</sub> = 0 V <sub>CE</sub> = 800V; V <sub>BE</sub> = 0, T <sub>C</sub> = 125°C			0.1 0.5	mA
I <sub>CEO</sub>	Collector Cutoff Current	V <sub>CE</sub> = 450V; I <sub>B</sub> = 0			0.25	mA
h <sub>FE-1</sub>	DC Current Gain	I <sub>C</sub> = 10mA; V <sub>CE</sub> = 5V	10			
h <sub>FE-2</sub>	DC Current Gain	I <sub>C</sub> = 0.5A; V <sub>CE</sub> = 5V			60	
h <sub>FE-3</sub>	DC Current Gain	I <sub>C</sub> = 2A; V <sub>CE</sub> = 5V	13		32	
V <sub>F</sub>	Diode Forward Voltage	I <sub>F</sub> = 2A			1.5	V

Switching Times, Resistive Load

t <sub>s</sub>	Storage Time	I <sub>C</sub> = 2.5A; I <sub>B1</sub> = -I <sub>B2</sub> = 0.5A; V <sub>CC</sub> = 150V; t <sub>p</sub> = 30 μ s			2.2	μ s
t <sub>f</sub>	Fall Time				0.8	μ s

◆ **h<sub>FE-3</sub> Classifications**

A	B
13-23	22-32