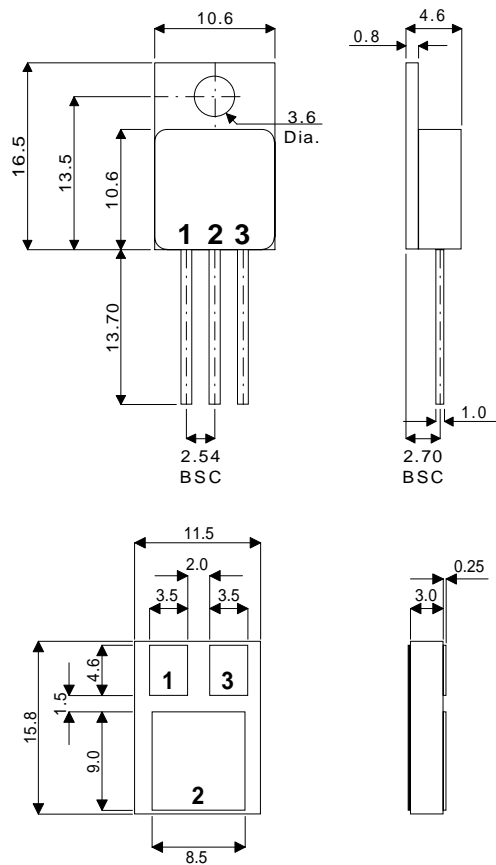


MECHANICAL DATA
 Dimensions in mm



**SILICON NPN
 EPITAXIAL BASE IN
 TO220 METAL AND
 CERAMIC SURFACE MOUNT
 PACKAGES**

FEATURES

- HERMETIC TO220 METAL OR CERAMIC PACKAGES
- HIGH RELIABILITY
- MILITARY AND SPACE OPTIONS
- SCREENING TO CECC LEVELS
- FULLY ISOLATED (METAL VERSION)

APPLICATIONS

- POWER LINEAR AND SWITCHING APPLICATIONS
- GENERAL PURPOSE POWER

TO220M - TO220 Metal Package - Isolated
TO220SM - TO220 Ceramic Surface Mount Package

Pin 1 – Base **Pin 2** – Collector **Pin 3** – Emitter

ABSOLUTE MAXIMUM RATINGS ($T_{case}=25^{\circ}C$ unless otherwise stated)		BDS10	BDS11	BDS12
V_{CBO}	Collector - Base voltage ($I_E = 0$)	60V	80V	100V
V_{CEO}	Collector - Emitter voltage ($I_B = 0$)	60V	80V	100V
V_{EBO}	Emitter - Base voltage ($I_C = 0$)		5V	
I_E, I_C	Emitter, Collector current		15A	
I_B	Base current		5A	
P_{tot}	Total power dissipation at $T_{case} \leq 75^{\circ}C$		90W	
T_{stg}	Storage Temperature		-65 TO 200°C	
T_j	Junction Temperature		200°C	

ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO} Collector cut-off current ($I_E = 0$)	BDS10 $V_{CB} = 60V$			500	μA
	BDS11 $V_{CB} = 80V$			500	
	BDS12 $V_{CB} = 100V$			500	
I_{CEO} Collector cut-off current ($I_B = 0$)	BDS10 $V_{CE} = 30V$			1	mA
	BDS11 $V_{CE} = 40V$			1	
	BDS12 $V_{CE} = 50V$			1	
I_{EBO} Emitter cut-off current ($I_C = 0$)	$V_{EB} = 5V$			1	mA
$V_{CEO(sus)^*}$ Collector - Emitter sustaining voltage ($I_B = 0$)	BDS10	60			V
	BDS11 $I_C = 100mA$	80			
	BDS12	100			
$V_{CE(sat)^*}$ Collector - Emitter saturation voltage	$I_C = 5A$ $I_B = 0.5A$			1	V
	$I_C = 10A$ $I_B = 2.5A$			3	
$V_{BE(sat)^*}$ Base - Emitter saturation voltage	$I_C = 10A$ $I_B = 2.5A$			2.5	V
V_{BE}^* Base - Emitter voltage	$I_C = 5A$ $V_{CE} = 4V$			1.5	V
h_{FE}^* DC Current gain	$I_C = 0.5A$ $V_{CE} = 4V$	40		250	
	$I_C = 5A$ $V_{CE} = 4V$	15		150	
	$I_C = 10A$ $V_{CE} = 4V$	5			
f_T Transition frequency	$I_C = 0.5A$ $V_{CE} = 4V$	3			MHz

*Pulsed : Pulse duration = 300 μs , duty cycle = 1.5%

SWITCHING CHARACTERISTICS

Parameter	Test Conditions	Max.	Unit
t_{on} On Time ($t_d + t_r$)	$I_C = 4A$ $V_{CC} = 30V$ $I_{B1} = 0.4A$	0.7	μs
t_s Storage Time	$I_C = 4A$ $V_{CC} = 30V$	1.0	μs
t_r Fall Time	$I_{B1} = -I_{B2} = 0.4A$	0.8	μs

THERMAL DATA

$R_{THj-case}$	Thermal resistance junction - case	Max. 1.4°C/W
$R_{THcase-sink}$	Thermal resistance case - heatsink **	Typ. 1.0°C/W
R_{THj-a}	Thermal resistance junction - ambient	Max. 80°C/W

** Smooth flat surface using thermal grease.