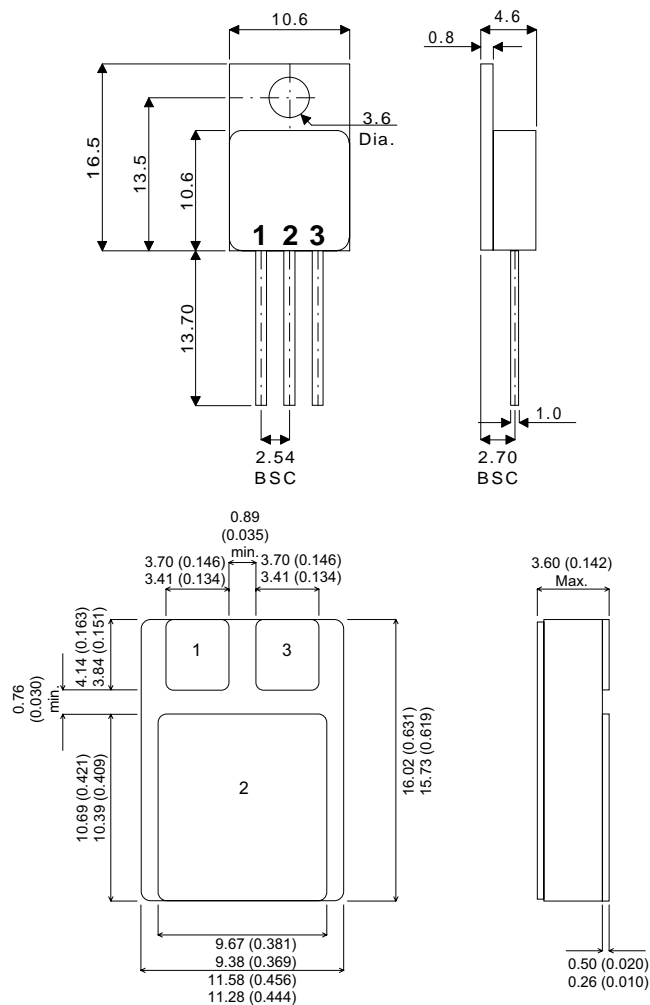


MECHANICAL DATA

Dimensions in mm



TO220M
SMD1

- TO220 Metal Package - Isolated
 - Ceramic Surface Mount Package

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

**SILICON PNP
 EPITAXIAL BASE IN
 TO220 METAL AND
 SMD1 CERAMIC SURFACE
 MOUNT PACKAGES**

FEATURES

- HERMETIC 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

ABSOLUTE MAXIMUM RATINGS ($T_{case}=25^{\circ}C$ unless otherwise stated)

		BDS13	BDS14	BDS15
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 ($I_E = 0$)	BDS13 $V_{CB} = -60V$ BDS14 $V_{CB} = -80V$ BDS15 $V_{CB} = -100V$			-500 -500 -500	μA
I_{CEO} Collector cut-off current ($I_B = 0$)	BDS13 $V_{CE} = -30V$ BDS14 $V_{CE} = -40V$ BDS15 $V_{CE} = -50V$			-1 -1 -1	mA
I_{EBO} Emitter cut-off current ($I_C = 0$)	$V_{EB} = -5V$			-1	mA
$V_{CEO(sus)^*}$ Collector - Emitter sustaining voltage ($I_B = 0$)	BDS13 BDS14 $I_C = -100mA$ BDS15	-60 -80 -100			V
$V_{CE(sat)^*}$ Collector - Emitter saturation voltage	$I_C = -5A$ $I_B = -0.5A$ $I_C = -10A$ $I_B = -2.5A$			-1 -3	V
$V_{BE(sat)^*}$ 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	$I_C = -0.5A$ $V_{CE} = -4V$ $I_C = -5A$ $V_{CE} = -4V$ $I_C = -10A$ $V_{CE} = -4V$	40 15 5		250 150	
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.