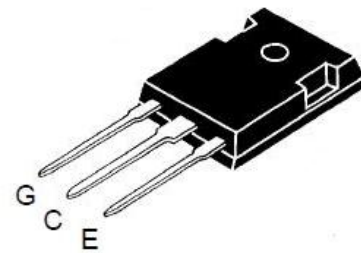


DOSEMI™**IGBT****GD25SGT120T2S****Preliminary****1200V/25A 1 in one-package****General Description**

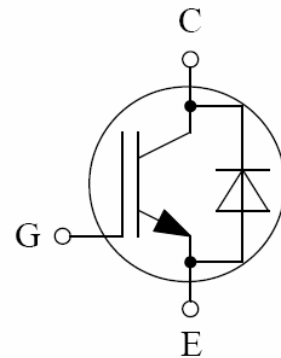
DOSEMI IGBT Power Discretes provides ultra low conduction loss as well as short circuit ruggedness. They are designed for the applications such as Electronic welders.



TO-247

Features

- Low $V_{CE(sat)}$ trench IGBT technology
- Low switching loss
- Maximum junction temperature 175°C
- 10 μ s short circuit capability
- Square RBSOA
- $V_{CE(sat)}$ with positive temperature coefficient
- Fast & soft reverse recovery anti-parallel FWD
- Tight parameter distribution
- Lead free package



Equivalent Circuit Schematic

Typical Applications

- Electronic welders

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Description	GD25SGT120T2S	Units
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate-Emitter Voltage	± 20	V
I_C	Collector Current @ $T_C=25^\circ\text{C}$	50	A
	@ $T_C=100^\circ\text{C}$	25	
$I_{CM(1)}$	Pulsed Collector Current $t_p=1\text{ms}$	50	A
I_F	Diode Continuous Forward Current @ $T_C=100^\circ\text{C}$	25	A
$I_{FM(1)}$	Diode Maximum Forward Current	50	A
P_D	Maximum power Dissipation @ $T_j=175^\circ\text{C}$	517	W
T_{SC}	Short Circuit Withstand Time @ $T_j=150^\circ\text{C}$	10	μs
T_j	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-40 to +125	$^\circ\text{C}$
T_S	Soldering Temperature, 1.6mm from case for 10s	260	$^\circ\text{C}$

Notes:

(1) Repetitive rating: Pulse width limited by max. junction temperature

Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted**Off Characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$T_j=25^\circ\text{C}$	1200			V
I_{CES}	Collector Cut-Off Current	$V_{CE}=V_{CES}, V_{GE}=0\text{V},$ $T_j=25^\circ\text{C}$			25	μA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=V_{GES}, V_{CE}=0\text{V},$ $T_j=25^\circ\text{C}$			100	nA

On Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=1.2\text{mA}, V_{CE}=V_{GE},$ $T_j=25^\circ\text{C}$	5.0	6.1	7.5	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	$I_C=25\text{A}, V_{GE}=15\text{V},$ $T_j=25^\circ\text{C}$		1.94	2.3	V
		$I_C=25\text{A}, V_{GE}=15\text{V},$ $T_j=150^\circ\text{C}$		2.40		
		$I_C=25\text{A}, V_{GE}=15\text{V},$ $T_j=175^\circ\text{C}$		2.50		

Switching Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
Q_g	Total Gate Charge	$V_{CC}=600V, I_C=25A,$ $V_{GE}=15V$		160		nC
Q_{ge}	Gate-to-Emitter Charge			30		nC
Q_{gc}	Gate-to-Collector Charge			70		nC
$t_{d(on)}$	Turn-On Delay Time	$V_{CC}=600V, I_C=25A,$ $R_G=10\Omega, V_{GE}=15V,$ $T_j=25^\circ C$		60		ns
t_r	Rise Time			35		ns
$t_{d(off)}$	Turn-Off Delay Time			230		ns
t_f	Fall Time			70		ns
E_{on}	Turn-On Switching Loss			1.61		mJ
E_{off}	Turn-Off Switching Loss			1.25		mJ
E_{total}	Total Switching Loss			2.86		mJ
$t_{d(on)}$	Turn-On Delay Time	$V_{CC}=600V, I_C=25A,$ $R_G=10\Omega, V_{GE}=15V,$ $T_j=175^\circ C$		60		ns
t_r	Rise Time			40		ns
$t_{d(off)}$	Turn-Off Delay Time			275		ns
t_f	Fall Time			200		ns
E_{on}	Turn-On Switching Loss			2.69		mJ
E_{off}	Turn-Off Switching Loss			2.11		mJ
E_{total}	Total Switching Loss			4.80		mJ
C_{ies}	Input Capacitance	$V_{CE}=30V, f=1MHz,$ $V_{GE}=0V$		3.43		nF
C_{oes}	Output Capacitance			0.13		nF
C_{res}	Reverse Transfer Capacitance			0.08		nF

Electrical Characteristics of DIODE $T_C=25^\circ C$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	$I_F=25A$	$T_j=25^\circ C$	2.10	2.50	V
			$T_j=125^\circ C$	2.15		
Q_r	Recovered Charge	$I_F=25A,$	$T_j=25^\circ C$	1.6		μC
			$T_j=125^\circ C$	3.3		
I_{RM}	Reverse Recovery Current	$V_R=600V,$ $di/dt=-400A/\mu s,$	$T_j=25^\circ C$	16		A
			$T_j=125^\circ C$	21		
E_{rec}	Reverse Recovery Energy	$V_{GE}=-15V$	$T_j=25^\circ C$	0.4		mJ
			$T_j=125^\circ C$	0.8		

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case (Per IGBT)		0.29	K/W
$R_{\theta JC}$	Junction-to-Case (Per Diode)		0.58	K/W
$R_{\theta JA}$	Junction-to-Ambient (Conductive grease applied)	40		K/W

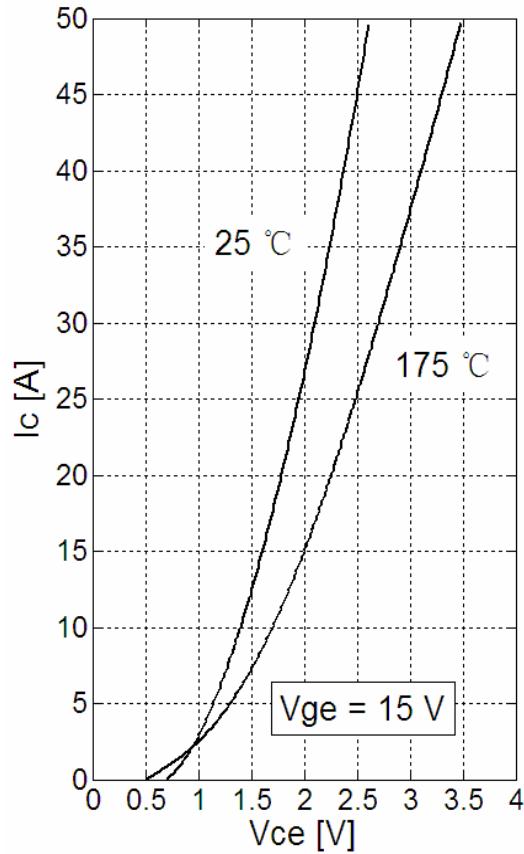


Fig 1. IGBT Typical Output Characteristics

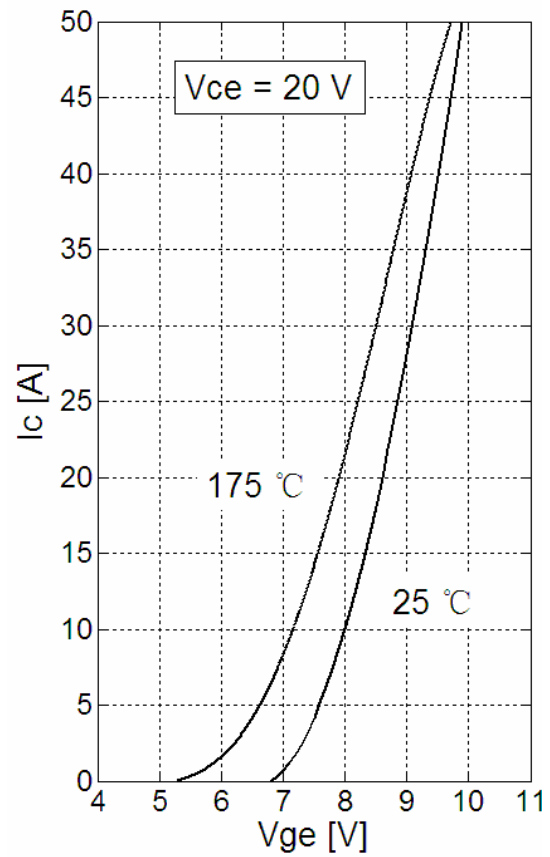


Fig 2. IGBT Typical Transfer Characteristics

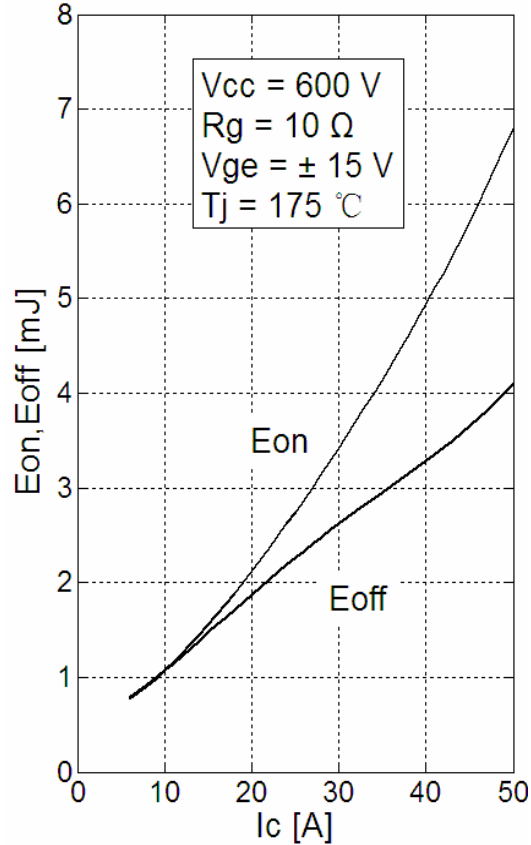


Fig 3. IGBT Switching Loss vs. I_c

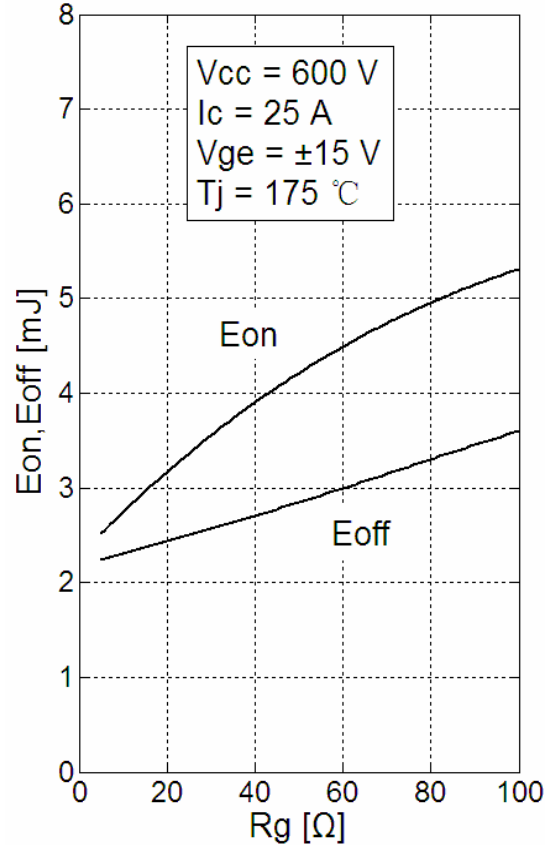


Fig 4. IGBT Switching Loss vs. R_g

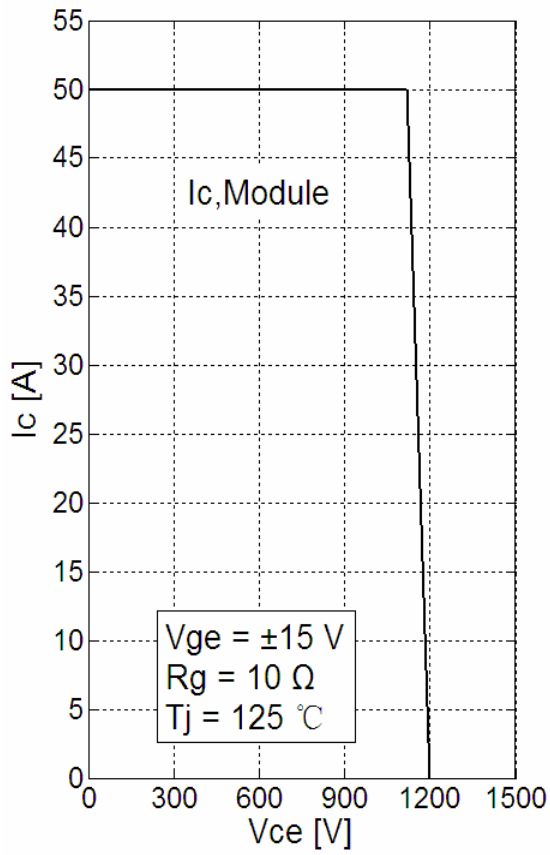


Fig 5. RBSOA

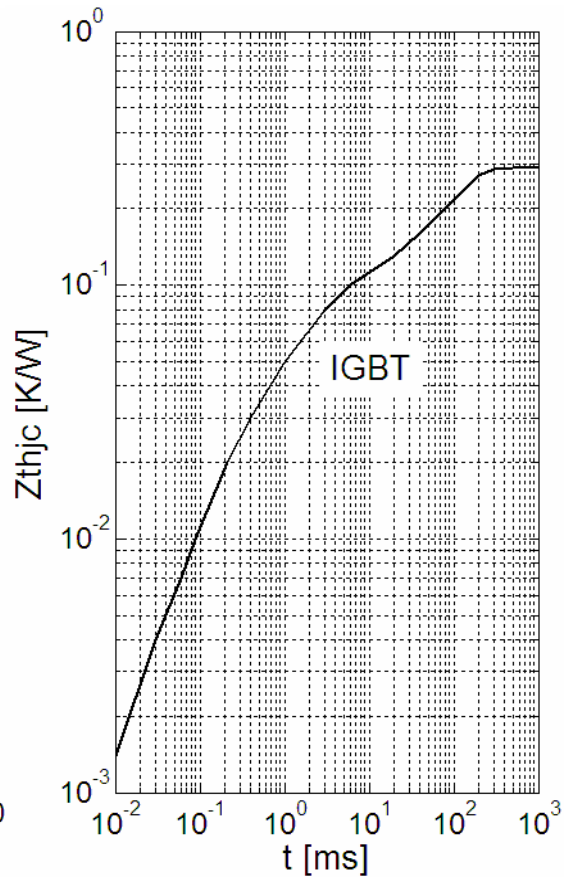


Fig 6. IGBT Transient Thermal Impedance

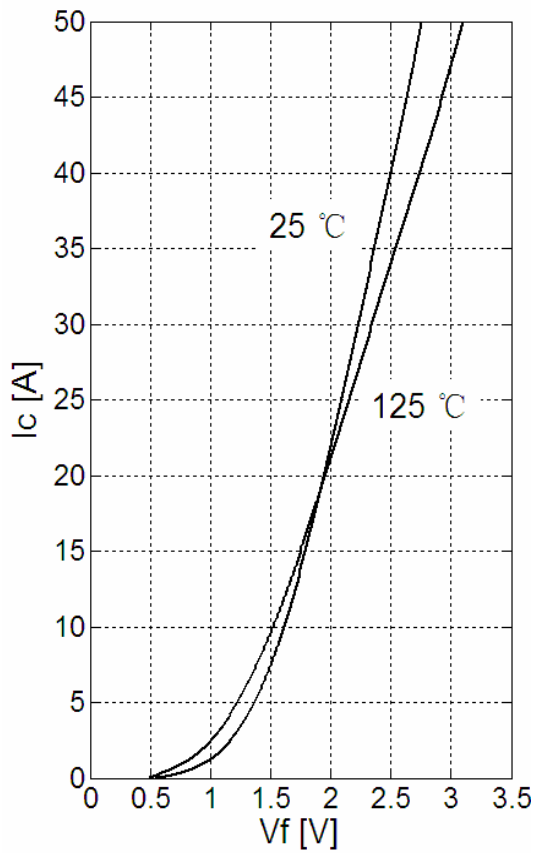


Fig 7. Diode Forward Characteristics

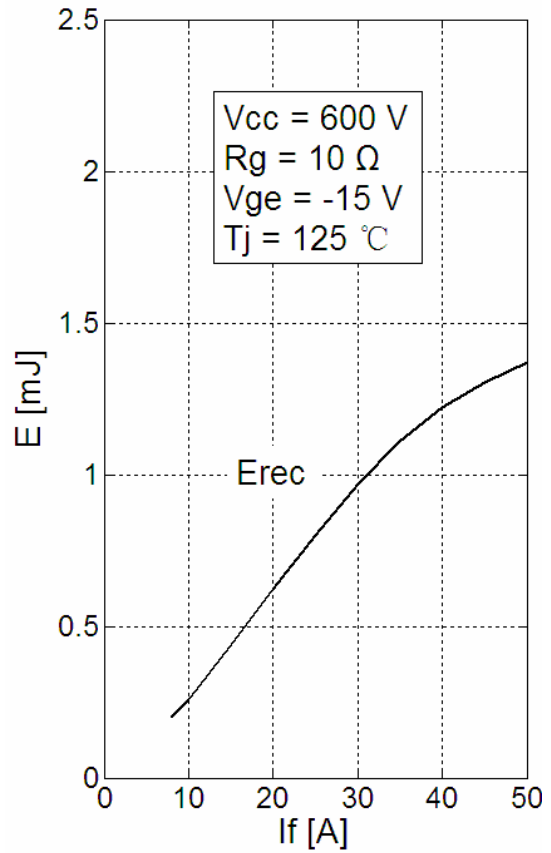


Fig 8. Diode Switching Loss vs. I_f

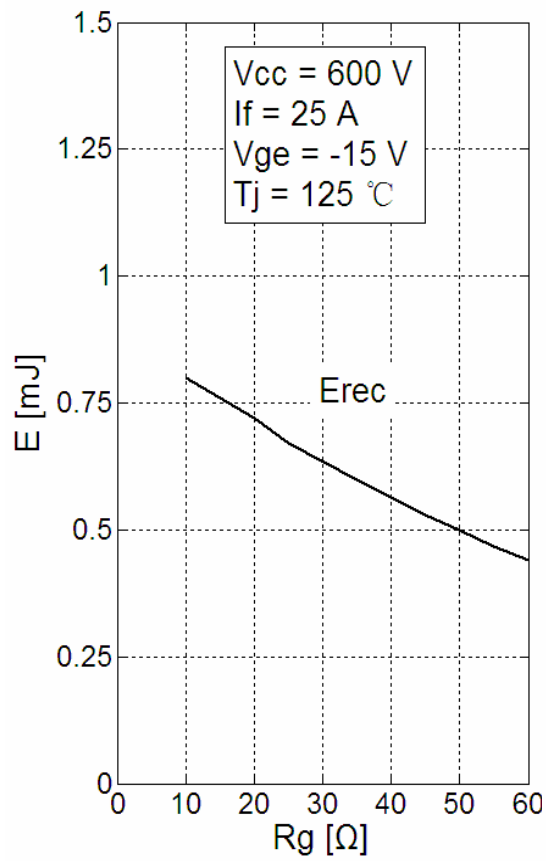


Fig 9. Diode Switching Loss vs. R_G

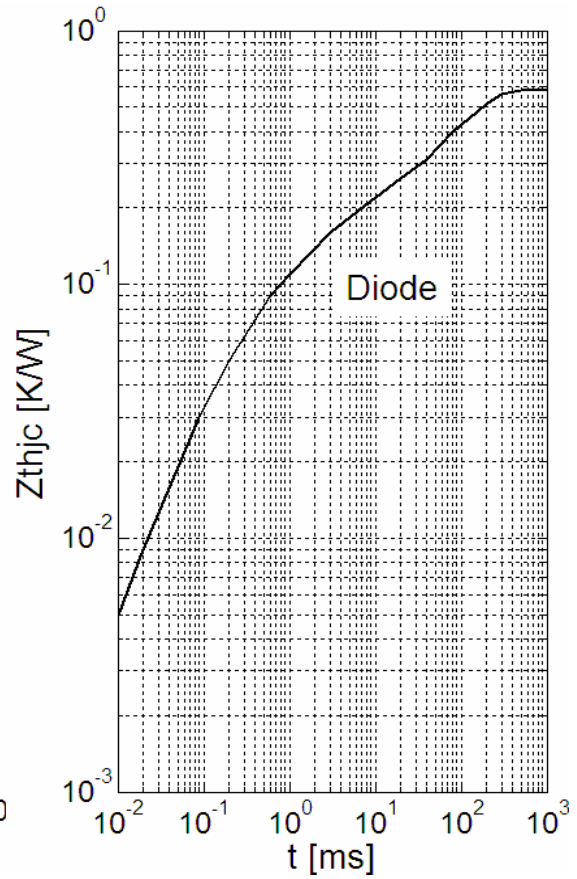
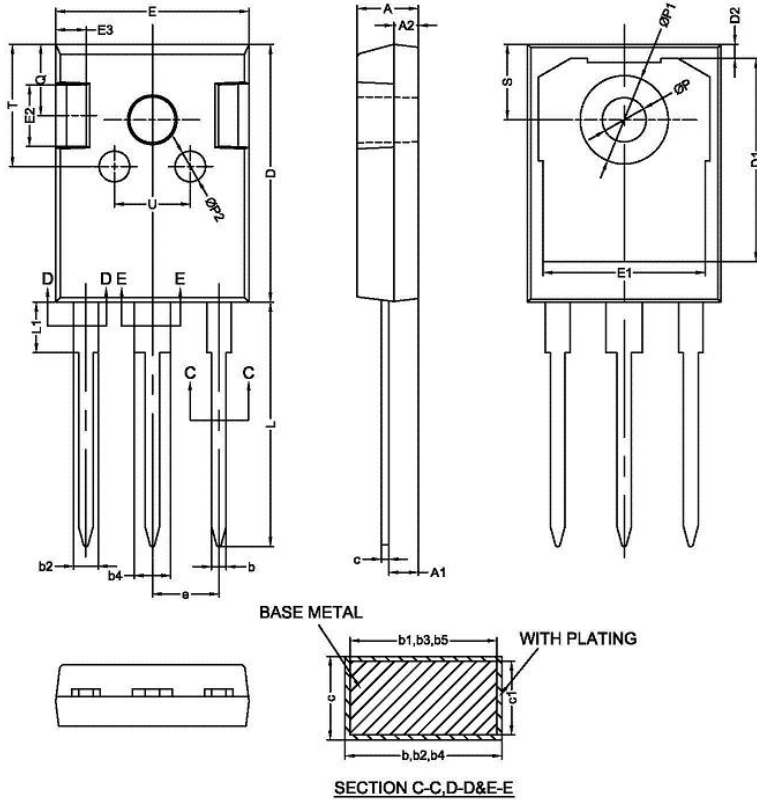


Fig 10. Diode Transient Thermal Impedance

Package Dimension

Dimensions in Millimeters



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
b	1.16	-	1.26
b1	1.15	1.2	1.22
b2	1.96	-	2.06
b3	1.95	2.00	2.02
b4	2.96	-	3.06
b5	2.95	3.00	3.02
c	0.59	-	0.66
c1	0.58	0.60	0.62
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.20	1.35
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
e	5.44BSC		
L	19.80	19.92	20.10
L1	-	-	4.30
P	3.50	3.60	3.70
P1	-	-	7.40
P2	2.40	2.50	2.60
Q	5.60	-	6.00
S	6.15BSC		
T	9.80	-	10.20
U	6.00	-	6.40

NOTES:
 1.ALL DIMENSIONS REFER TO JEDEC STANDARD TO-247 AD DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.
 2.EJECTION MARK DEPTH 0.10^{+0.15}_{-0.05}.

Terms and Conditions of Usage

The data contained in this product datasheet is exclusively intended for technically trained staff. you and your technical departments will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to such application.

This product data sheet is describing the characteristics of this product for which a warranty is granted. Any such warranty is granted exclusively pursuant the terms and conditions of the supply agreement. There will be no guarantee of any kind for the product and its characteristics.

Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of our product, please contact the sales office, which is responsible for you, For those that are specifically interested we may provide application notes.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the Product in aviation applications, in health or live endangering or life support applications, please notify.

If and to the extent necessary, please forward equivalent notices to your customers.
Changes of this product data sheet are reserved.