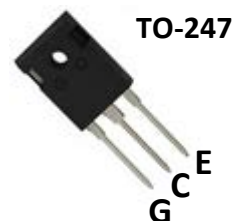


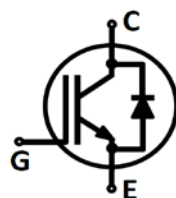
### 特征

饱和压降为正温度系数，易于并联使用  
 内置快恢复二极管  
 高可靠性及热稳定性，良好的参数一致性  
 极低的关断损耗



### 应用领域

逆变焊机、UPS等



### 最大额定值<sup>1</sup>

参数	符号	额定值	单位
集电极-发射极电压	$V_{CE}$	1200	V
集电极电流 $T_C=25^\circ\text{C}$ $T_C=100^\circ\text{C}$	$I_C$	50 <sup>2</sup> 25	A
集电极脉冲电流	$I_{Cpuls}$	75* <sup>3</sup>	
RBSOA电流 $V_{CE}<1200\text{V}, T_j<150^\circ\text{C}$	$I_{Cpeak}$	75*	
二极管正向电流 $T_C=25^\circ\text{C}$ $T_C=100^\circ\text{C}$	$I_F$	50 <sup>2</sup> 15 <sup>2</sup>	
二极管脉冲电流	$I_{Fpuls}$	45*	
栅极-发射极电压	$V_{GE}$	$\pm 20$	V
耗散功率 $T_C=25^\circ\text{C}$ $T_C=100^\circ\text{C}$	$P_{tot}$	216 86	W
工作结温	$T_j$	-55~150	°C
储存温度	$T_{stg}$	-55~150	

<sup>1</sup>测试标准参考JESD-022

<sup>2</sup>受限于邦定线

<sup>3</sup>加\*表示估计值，下同

<sup>4</sup>允许短路次数:<1000;短路时间间隔:>1s

## 热学特性

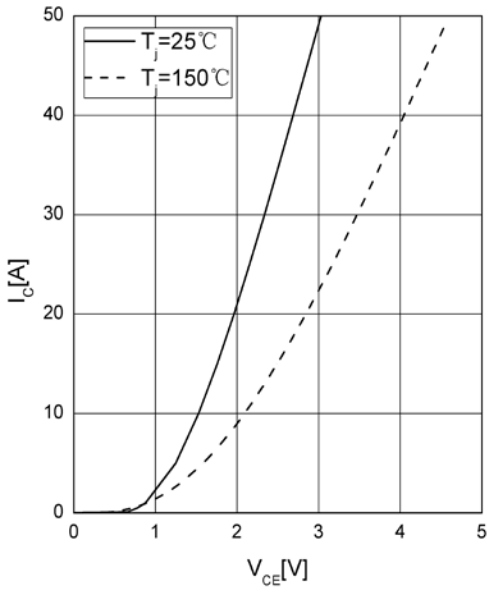
参数	符号	封装形式	最小值	典型值	最大值	单位
IGBT结壳热阻	$R_{thJC}$	TO-247	-	-	0.58	K/W
二极管结壳热阻	$R_{thJD}$	TO-247	-	-	1.5	
结-环境热阻	$R_{thJA}$	TO-247	-	-	40	

## 电学特性 (未特殊说明时, $T_j=25^\circ\text{C}$ )

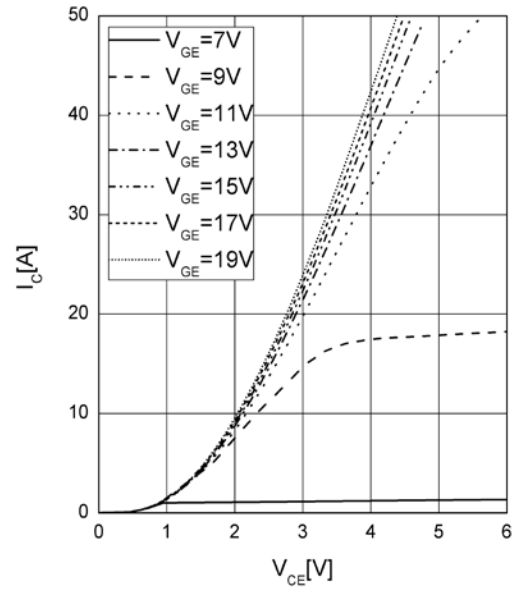
参数	符号	测试条件	最小值	典型值	最大值	单位
<b>静态特性</b>						
击穿电压	$V_{(BR)CES}$	$V_{GE}=0V, I_C=0.5mA$	1200	-	-	V
IGBT导通压降	$V_{CE(sat)}$	$V_{GE}=15V, I_C=25A$	-	2.1	2.8	
		$T_j=150^\circ\text{C}$	-	3.2	-	
二极管正向压降	$V_F$	$V_{GE}=0V, I_F=25A$	-	4.7	-	
		$T_j=150^\circ\text{C}$	-	4.1	-	
阈值电压	$V_{GE(th)}$	$I_C=1mA, V_{CE}=V_{GE}$	5	6.1	6.5	
集电极-发射极漏电流	$I_{CES}$	$V_{CE}=1200V, V_{GE}=0V$	-	-	0.1	mA
		$T_j=150^\circ\text{C}$	-	-	2	
栅极-发射极漏电流	$I_{GES}$	$V_{CE}=0V, V_{GE}=20V$	-	-	200	nA
<b>动态特性</b>						
输入电容	$C_{iss}$	$V_{CE}=25V$	-	2750	-	pF
输出电容	$C_{oss}$	$V_{GE}=0V$	-	85	-	
反馈电容	$C_{rss}$	$f=1MHz$	-	48	-	
栅电荷	$Q_G$	$V_{CC}=600V, I_C=25A, V_{GE}=15V$	-	117	-	nC

参数	符号	测试条件	最小值	典型值	最大值	单位
<b>IGBT开关特性 (感性负载)</b>						
开通延迟时间	$t_{d(on)}$	$T_j=25^\circ\text{C}$ $V_{CC}=600\text{V}, I_C=25\text{A}$ $V_{GE}=15/0\text{V}$	-	32	-	ns
上升时间	$t_r$		-	54	-	
关断延迟时间	$t_{d(off)}$		-	175	-	
下降时间	$t_f$		-	40	-	
开通损耗	$E_{on}$	$R_G=15\Omega$ $L_{load}=500\mu\text{H}$	-	1.4	-	mJ
关断损耗	$E_{off}$		-	0.6	-	
开关损耗	$E_{ts}$		-	2.0	-	
开通延迟时间	$t_{d(on)}$	$T_j=150^\circ\text{C}$ $V_{CC}=600\text{V}, I_C=25\text{A}$ $V_{GE}=15/0\text{V}$	-	29	-	ns
上升时间	$t_r$		-	49	-	
关断延迟时间	$t_{d(off)}$		-	200	-	
下降时间	$t_f$		-	57	-	
开通损耗	$E_{on}$	$R_G=15\Omega$ $L_{load}=500\mu\text{H}$	-	1.4	-	mJ
关断损耗	$E_{off}$		-	0.7	-	
开关损耗	$E_{ts}$		-	2.1	-	
<b>二极管开关特性</b>						
反向恢复时间	$t_{rr}$	$T_j=25^\circ\text{C}$ $V_R=600\text{V}, I_F=25\text{A}$ $di_F/dt=600\text{A}/\mu\text{s}$	-	58	-	ns
反向恢复电荷	$Q_{rr}$		-	1.1	-	$\mu\text{C}$
反向恢复峰值电流	$I_{rrm}$		-	32	-	A
反向恢复时间	$t_{rr}$	$T_j=150^\circ\text{C}$ $V_R=600\text{V}, I_F=25\text{A}$ $di_F/dt=600\text{A}/\mu\text{s}$	-	78	-	ns
反向恢复电荷	$Q_{rr}$		-	1.8	-	$\mu\text{C}$
反向恢复峰值电流	$I_{rrm}$		-	39	-	A

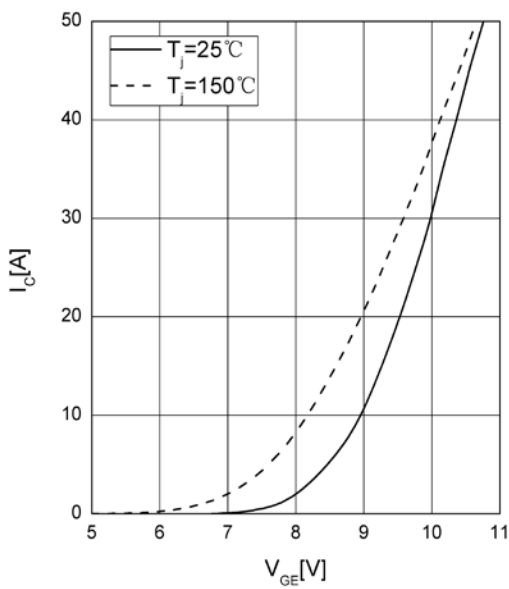
输出特性 IGBT  
output characteristic IGBT  
 $I_c = f(V_{CE}), V_{GE} = 15V$



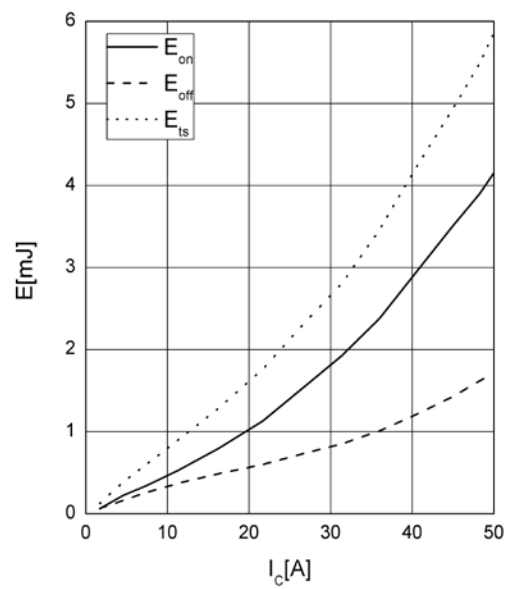
输出特性 IGBT  
output characteristic IGBT  
 $I_c = f(V_{CE}), T_j = 150^\circ C$



传输特性 IGBT  
transfer characteristic IGBT  
 $I_c = f(V_{GE}), V_{CE} = 20V$



开关损耗 IGBT  
switching losses IGBT  
 $E_{on} = f(I_c), E_{off} = f(I_c), E_{ts} = f(I_c)$   
 $V_{GE} = 15/0V, R_G = 15\Omega, V_{CE} = 600V, T_j = 150^\circ C$

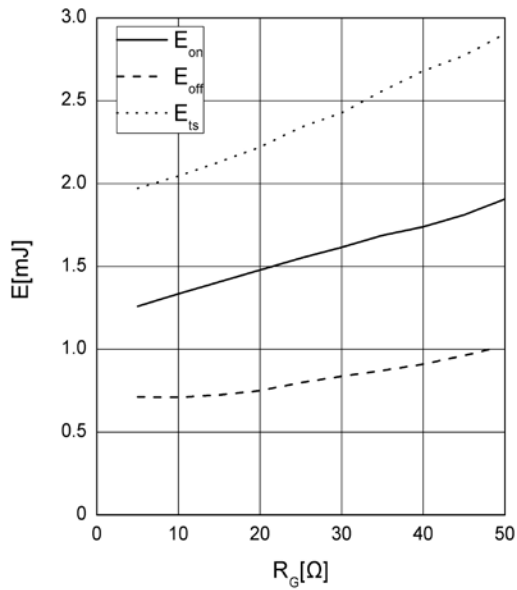


开关损耗 IGBT

switching losses IGBT

$E_{on} = f(R_G)$ ,  $E_{off} = f(R_G)$ ,  $E_{ts} = f(R_G)$

$V_{GE} = 15/0\text{ V}$ ,  $I_C = 25\text{ A}$ ,  $V_{CE} = 600\text{ V}$ ,  $T_J = 150^\circ\text{C}$

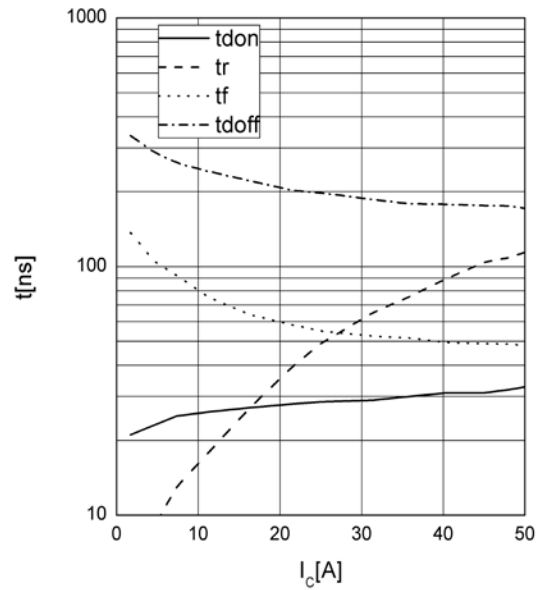


开关时间 IGBT

switching times IGBT

$t_d(on) = f(I_C)$ ,  $t_r = f(I_C)$ ,  $t_f = f(I_C)$ ,  $t_d(off) = f(I_C)$

$V_{GE} = 15/0\text{ V}$ ,  $R_G = 15\ \Omega$ ,  $V_{CE} = 600\text{ V}$ ,  $T_J = 150^\circ\text{C}$

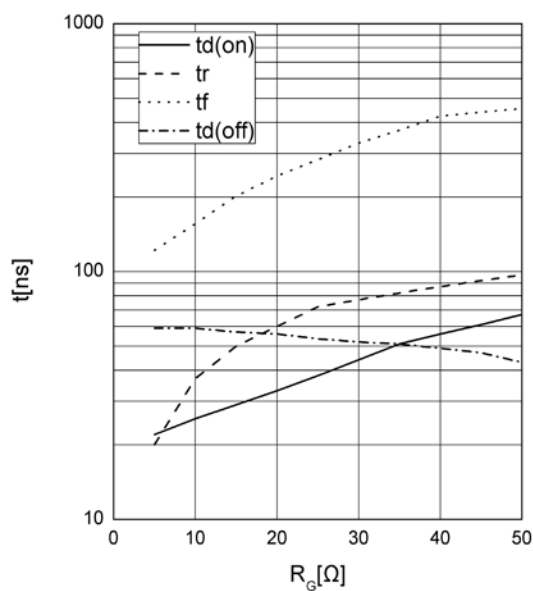


开关时间 IGBT

switching times IGBT

$t_d(on) = f(R_G)$ ,  $t_r = f(R_G)$ ,  $t_f = f(R_G)$ ,  $t_d(off) = f(R_G)$

$V_{GE} = 15/0\text{ V}$ ,  $I_C = 25\text{ A}$ ,  $V_{CE} = 600\text{ V}$ ,  $T_J = 150^\circ\text{C}$

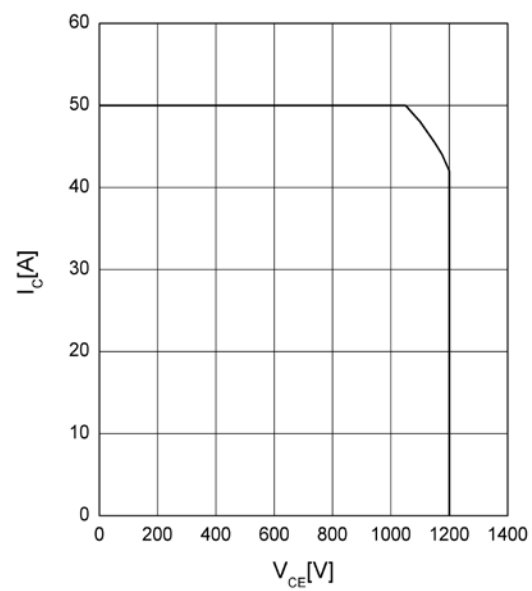


反偏安全工作区 IGBT

reverse bias safe operating area IGBT

$I_C = f(V_{CE})$

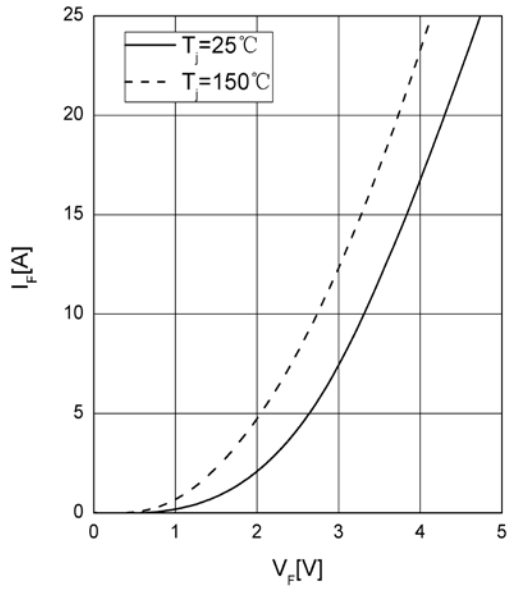
$V_{GE} = 15/0\text{ V}$ ,  $R_{Goff} = 15\ \Omega$ ,  $T_J = 150^\circ\text{C}$



正向偏压特性 二极管

forward characteristic of Diode

$I_F = f(V_F)$



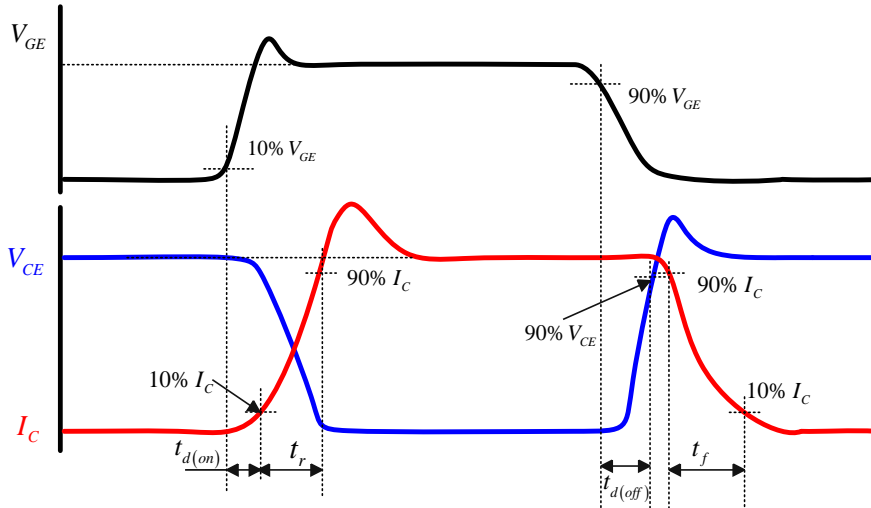


Figure A. Definition of switching times

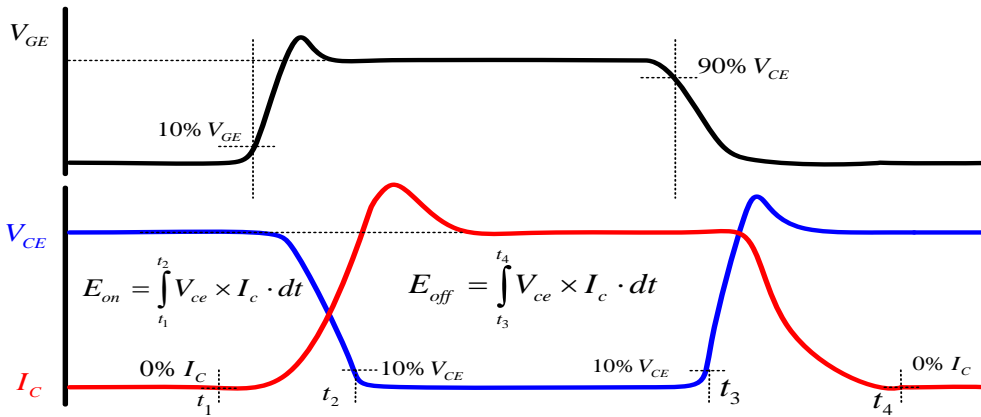


Figure B. Definition of switching losses

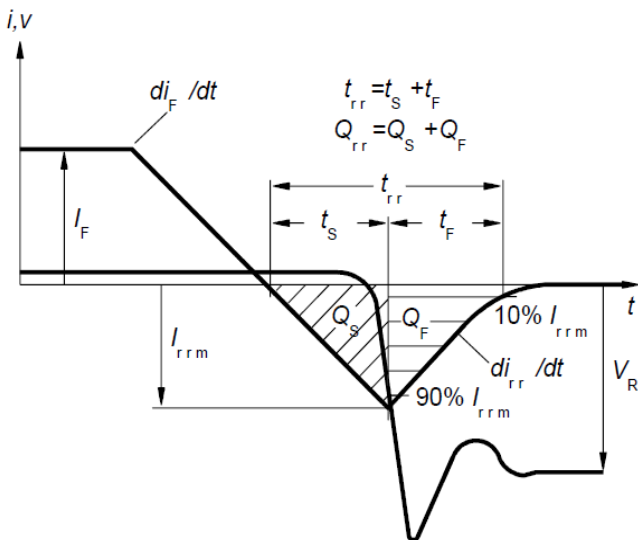


Figure C. Definition of diodes switching characteristics

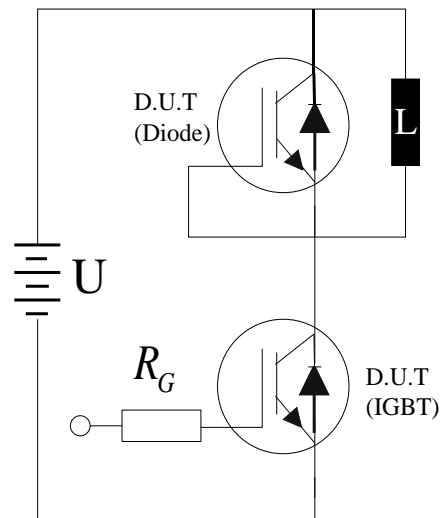
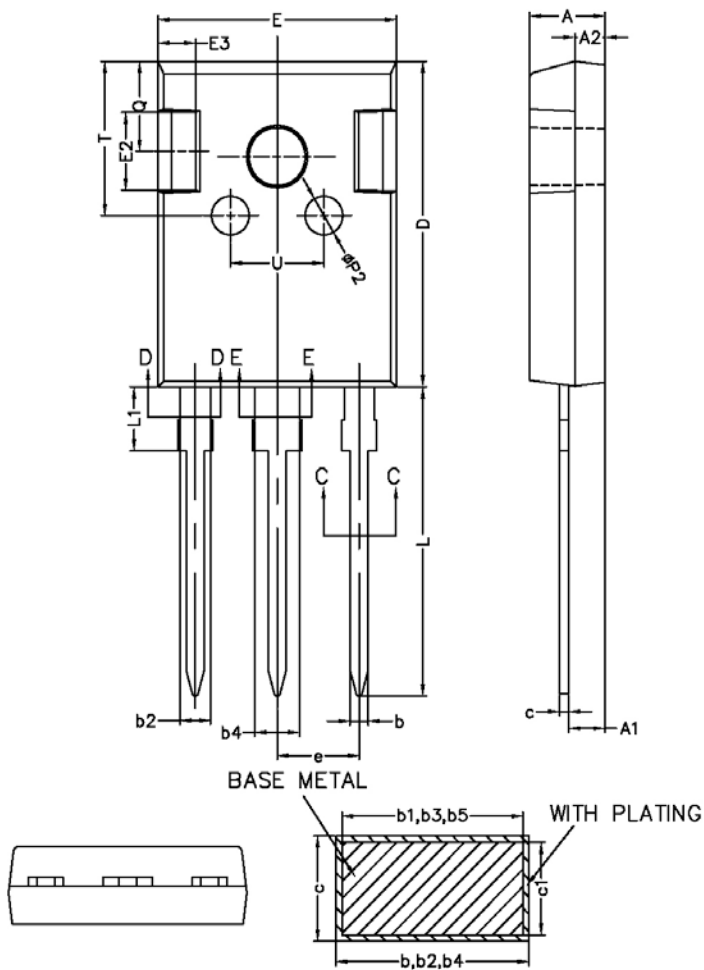


Figure D. Dynamic test circuit

**TO-247**

**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
a	0	-	0.15
a'	0	-	0.15
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
b6	-	-	2.25
b7	-	-	3.25
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	5.34	5.44	5.54
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	6.05	6.15	6.25
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  $0.10 \pm 0.15$