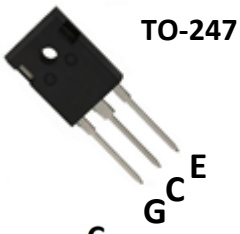
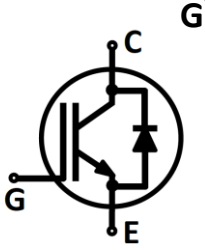
KWBW25N120S2E1

1200V 25A 沟槽栅场截止型IGBT

特征

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





应用领域

逆变焊机

最大额定值[1)]

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°C T_C=100°C	I_C	 50 25	A
集电极脉冲电流	I_{Cpuls}	75*[2)]	
RBSOA电流 VCE<1200V,Tj<150°C	I_{Cpeak}	75*	
二极管正向电流 T_C=25°C T_C=100°C	I_F	 30[3)] 15	
二极管脉冲电流	I_{Fpuls}	45*	
栅极-发射极电压	V_{GE}	±20	V
耗散功率 T_C=25°C T_C=100°C	P_{tot}	 255 102	W
工作结温	T_j	-55~150	°C
储存温度	T_{stg}	-55~150	

[1)]测试标准参考JESD-022

[2)]加*表示估计值，下同

[3]受限于邦定线

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	-	-	0.49	K/W
二极管结壳热阻	R_{thJCD}	TO-247	-	-	1.2	
结-环境热阻	R_{thJA}	TO-247	-	-	40	

电学特性（未特殊说明时，T_j=25℃）

参数	符号	测试条件	最小值	典型值	最大值	单位
静态特性						
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 T_j=25℃ T_j=150℃	 - -	 2.30 2.60	 2.60 -	
二极管正向压降	V_F	V_{GE}=0V,I_F=25A T_j=25℃ T_j=150℃	 - -	 2.50 2.75	 - -	
阈值电压	$V_{GE(th)}$	I_C=1mA,V_{CE}=V_{GE}	5.0	6.1	7.0	
集电极-发射极漏电流	I_{CES}	V_{CE}=1200V,V_{GE}=0V T_j=25℃ T_j=150℃	 - -	 - -	 0.1 2.0	mA
栅极-发射极漏电流	I_{GES}	V_{CE}=0V,V_{GE}=20V	-	-	100	nA
跨导	g_{FS}	V_{CE}=20V,I_C=25A	-	10.5	-	S
动态特性						
输入电容	C_{iss}	V_{CE}=25V V_{GE}=0V f=1MHz	-	3480	-	pF
输出电容	C_{oss}		-	99	-	
反馈电容	C_{rss}		-	58	-	
栅电荷	Q_G	V_{CC}=900V,I_C=25A, V_{GE}=15V	-	tbd	-	nC

参数	符号	测试条件	最小值	典型值	最大值	单位
IGBT开关特性（感性负载）						
开通延迟时间	$t_{d(on)}$	T_j=25℃	-	45	-	ns
上升时间	t_r	V_{CC}=600V,I_C=25A	-	50	-	
关断延迟时间	$t_{d(off)}$	V_{GE}=15/0V	-	165	-	
下降时间	t_f	R_G=15Ω	-	98	-	
开通损耗	E_{on}	L_{load}=500μH	-	1.33	-	mJ
关断损耗	E_{off}		-	0.82	-	
开关损耗	E_{ts}		-	2.15	-	
开通延迟时间	$t_{d(on)}$	T_j=150℃	-	35	-	ns
上升时间	t_r	V_{CC}=600V,I_C=25A	-	52	-	
关断延迟时间	$t_{d(off)}$	V_{GE}=15/0V	-	200	-	
下降时间	t_f	R_G=15Ω	-	225	-	
开通损耗	E_{on}	L_{load}=500μH	-	1.35	-	mJ
关断损耗	E_{off}		-	1.60	-	
开关损耗	E_{ts}		-	2.95	-	
二极管开关特性						
反向恢复时间	t_{rr}	T_j=25℃	-	115	-	ns
反向恢复电荷	Q_{rr}	V_R=600V, I_F=25A	-	1.60	-	μC
反向恢复峰值电流	I_{rrm}	di_F/dt=600A/μs	-	23.0	-	A
反向恢复时间	t_{rr}	T_j=150℃	-	180	-	ns
反向恢复电荷	Q_{rr}	V_R=600V, I_F=25A	-	2.20	-	μC
反向恢复峰值电流	I_{rrm}	di_F/dt=600A/μs	-	25.0	-	A

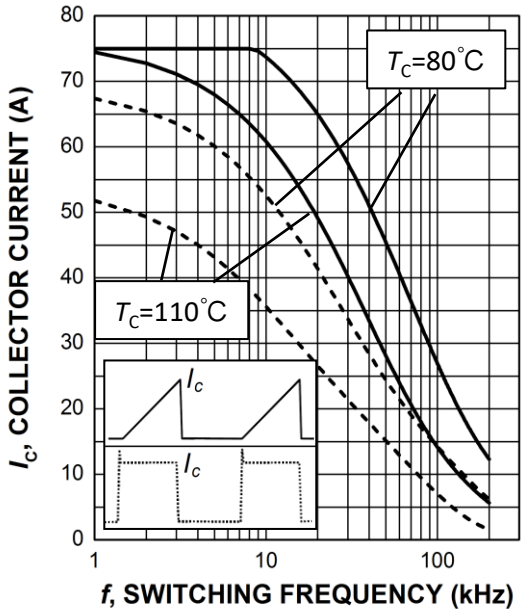


Figure 1. Collector current as a function of switching frequency
(T_j≤150°C, D = 0.5, V_{CE} = 600V,
V_{GE} = 0/+15V, R_G = 15Ω)

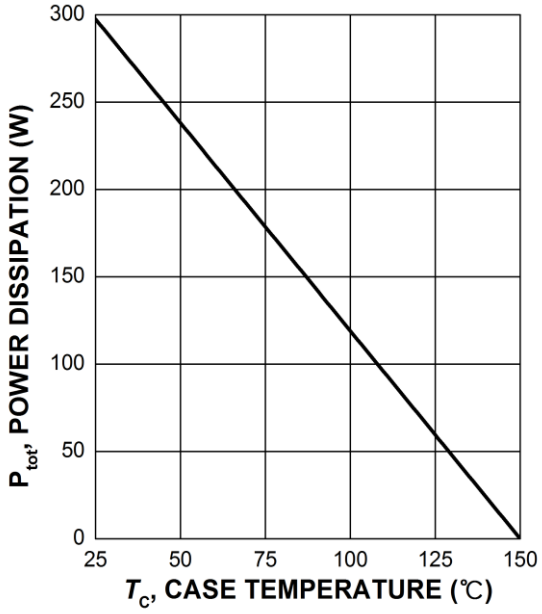


Figure 2. Maximum power dissipation as a function of case temperature
(T_j ≤ 150°C)

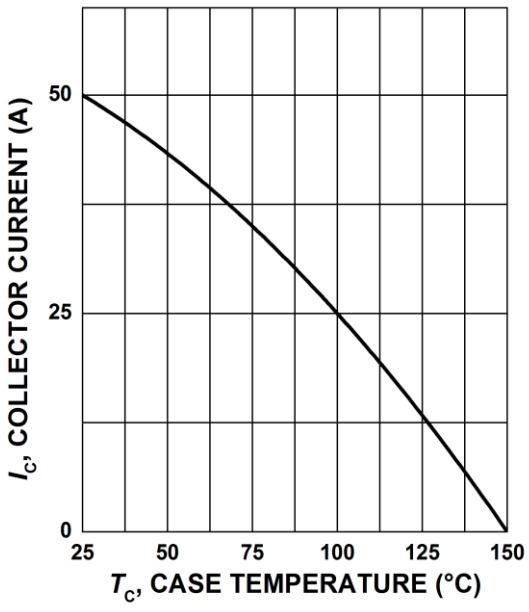


Figure 3. Maximum collector current as a function of case temperature
(V_{GE} ≥ 15V, T_j ≤ 150°C)

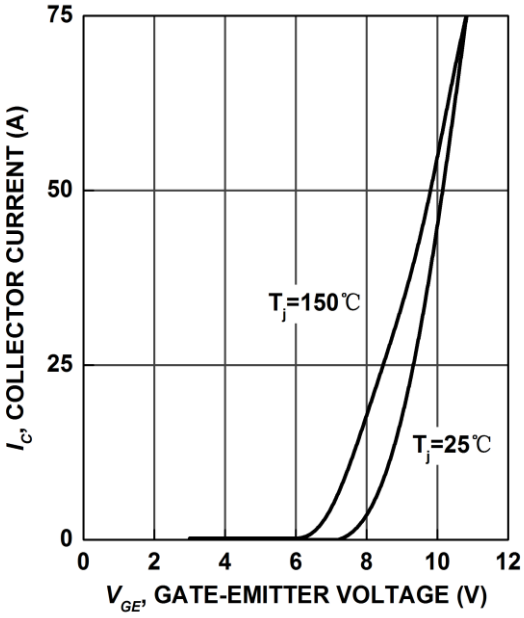


Figure 4. Typical transfer characteristic
(V_{CE}=15V)

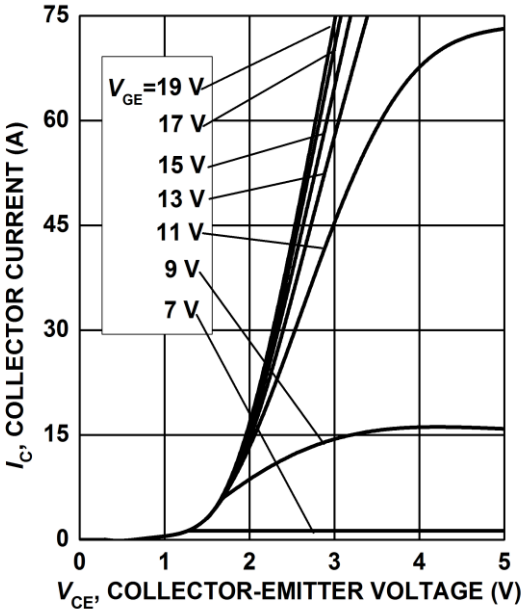


Figure 5. Typical output characteristic
(T_j = 25°C)

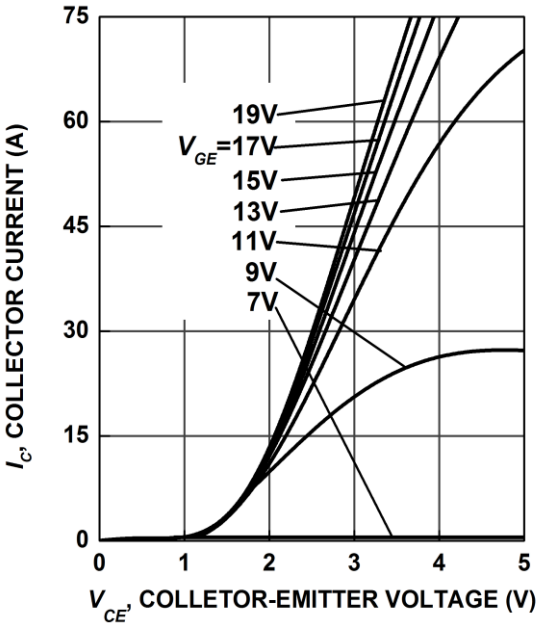


Figure 6. Typical output characteristic
(T_j = 150°C)

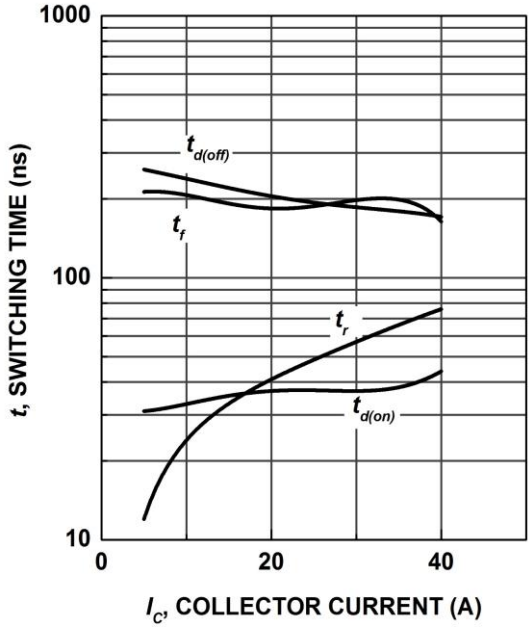


Figure 7. Typical switching times as a function of collector current
(inductive load, T_j=150°C, V_{CE}=600V, V_{GE}=0/15V, R_G=15Ω,
Dynamic test circuit in Figure D)

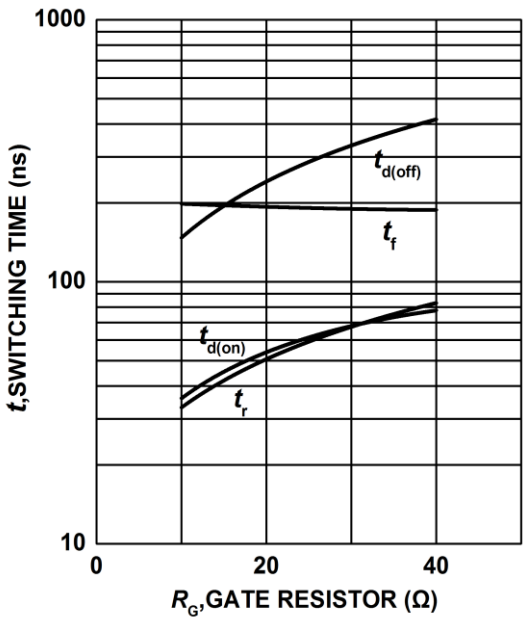


Figure 8. Typical switching times as a function of gate resistor
(inductive load, T_j=150°C, V_{CE}=600V, V_{GE}=0/15V, I_C=25A, Dynamic test circuit in Figure D)

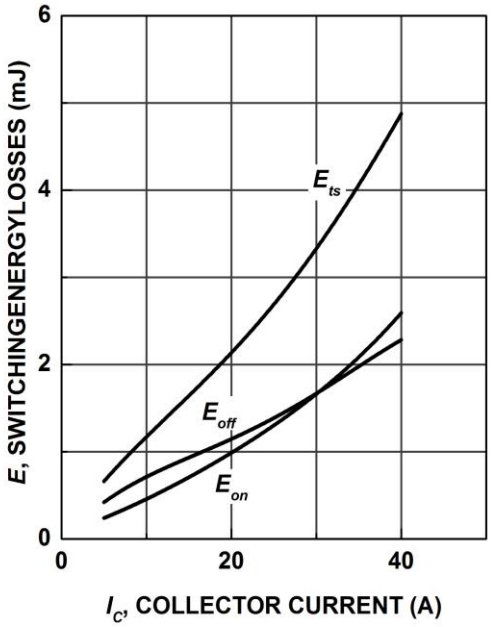


Figure 9. Typical switching energy losses as a function of collector current
(inductive load, T_j=150°C, V_{CE}=600V,
V_{GE}=0/15V, R_G=15Ω,
Dynamic test circuit in Figure D)

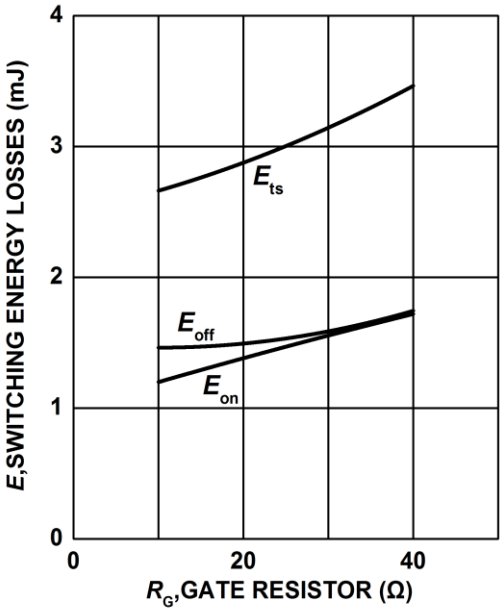


Figure 10. Typical switching energy losses as a function of gate resistor
(inductive load, T_j=150°C, V_{CE}=600V,
V_{GE}=0/15V, I_C=25A,
Dynamic test circuit in Figure D)

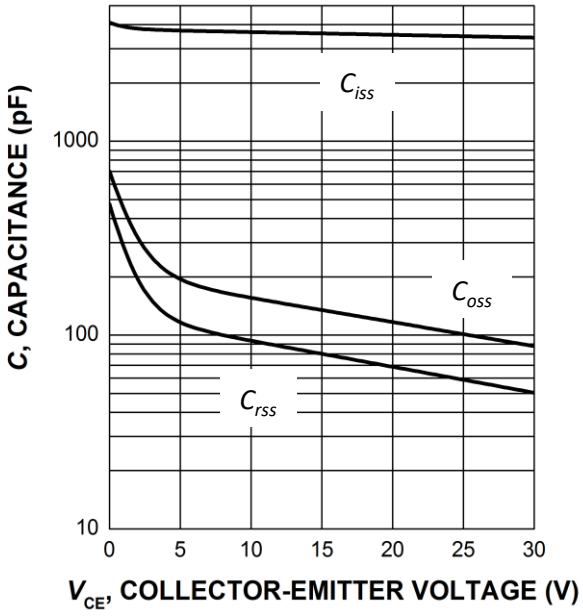


Figure 11. Typical capacitance as a function of collector-emitter voltage
(V_{GE}=0V, f = 1 MHz)

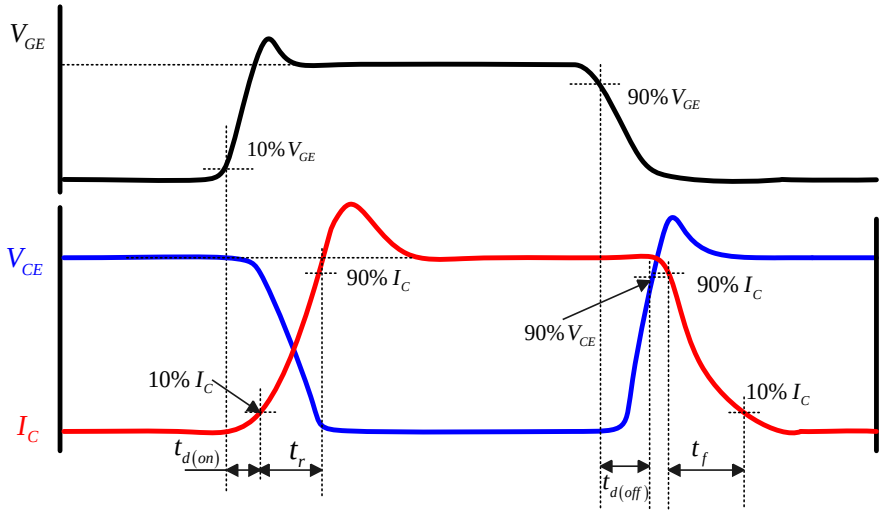


Figure A. Definition of switching times

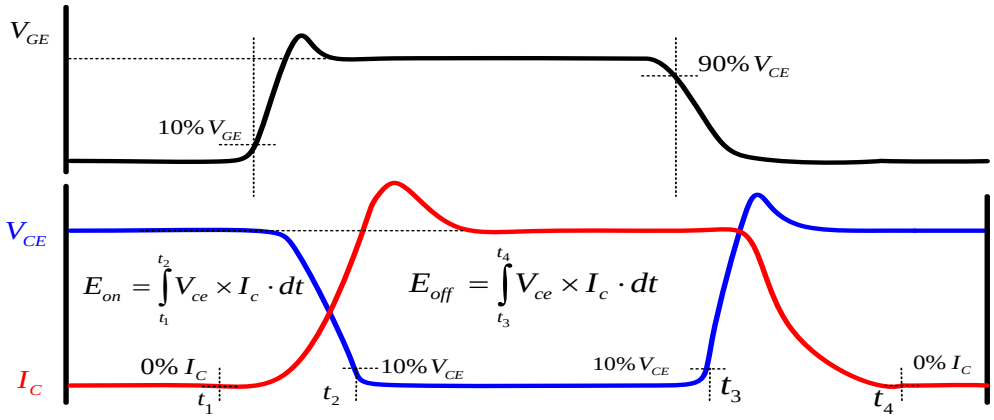


Figure B. Definition of switching losses

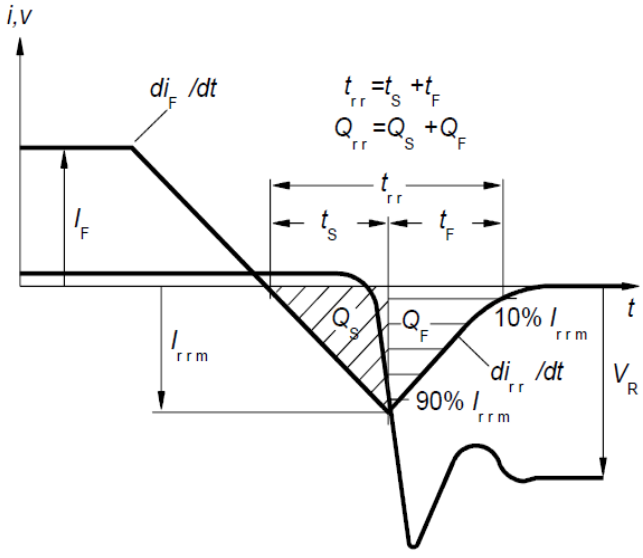


Figure C. Definition of diodes switching characteristics

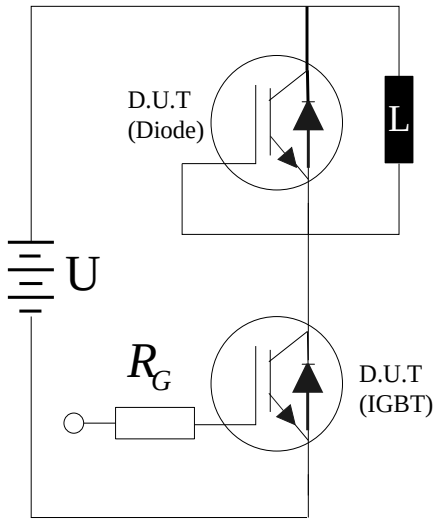


Figure D. Dynamic test circuit

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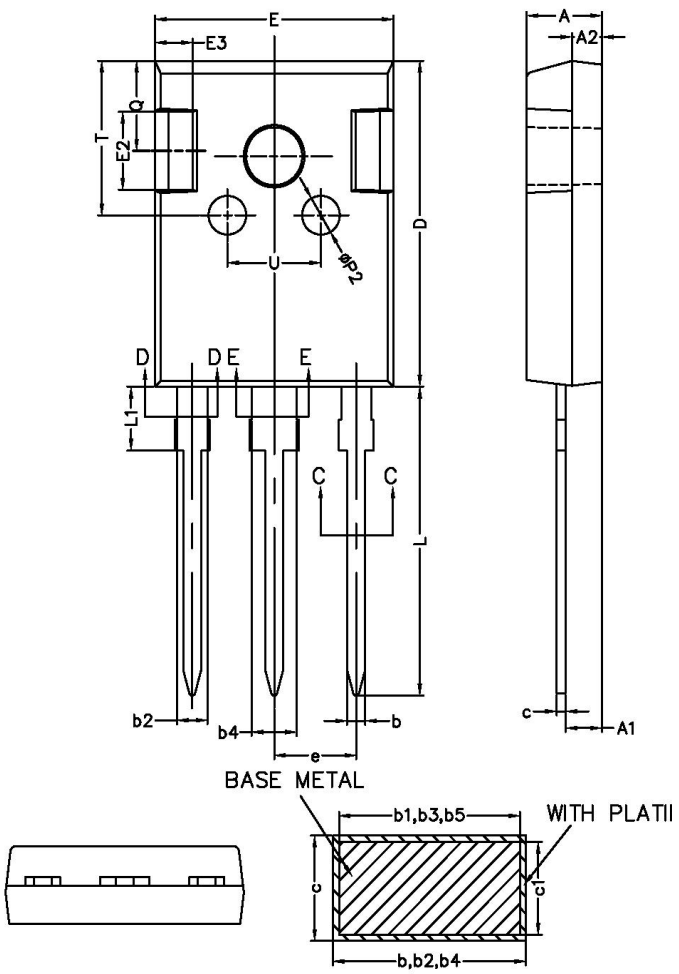

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

	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
②	a	0	–	0.15
②	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
②	b6	–	–	2.25
②	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
②	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
②	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 $0.10^{+0.15}_{0.05}$.