

75GU120F1

主要参数 Main Characteristics

I _C	75A
V _{ces}	1200 V
V _{cesat-typ}	1.85V

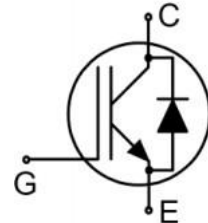
用途

- 光伏逆变器
- UPS 电源
- 电焊机
- 中高频率逆变器

Applications

- Solar Converters
- Uninterrupted Power Supply
- Welding Converters
- Mid to High Range Switching

Frequency Converters



TO-247-3L Plus

产品特性

- 1200V, 75A
- $V_{CE(sat)(typ.)} = 1.85V @ V_{GE} = 15V, I_C = 75A$
- Maximum Junction Temperature 150°C
- Pb-free Lead Plating; RoHS Compliant



产品中有毒有害物质或元素的名称及含量

部件名称 含量要求	有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
	≤0.1%	≤0.1%	≤0.01%	≤0.1%	≤0.1%	≤0.1%
引线框	○	○	○	○	○	○
塑封树脂	○	○	○	○	○	○
管 芯	○	○	○	○	○	○
内引线	○	○	○	○	○	○
焊 料	×	○	○	○	○	○
说 明	○：表示该元素的含量在SJ/T11363-2006 标准的限量要求以下。 ×：表示该元素的含量超出SJ/T11363-2006 标准的限量要求。 目前产品的焊料中含有铅 (Pb) 成分，但属于欧盟 RoHS 指令豁免范围。					

绝对最大额定值 **Absolute Ratings** ($T_c=25^{\circ}\text{C}$)

项 目 Parameter	符 号 Symbol	数 值 Value	单位 Unit
最高集电极-发射极直流电压 Collector-Emmitter Voltage	V_{ces}	1200	V
最高栅极发射极电压 Gate-Emmitter Voltage	V_{GES}	± 30	V
连续集电极电流 Collector Current-continuous	I_C $T_C=25^{\circ}\text{C}$	115	A
	I_C $T_C=100^{\circ}\text{C}$	75	A
最大脉冲集电极极电流 (注1) Collector Current – pulse (note 1)	I_{CM}	225	A
二极管正向电流 Diode Continuous Forward Current	I_F $T_C=100^{\circ}\text{C}$	75	A
二极管最大正向电流 Diode Maximum Forward Current (Note 1)	I_{FM}	225	A
短路时间 Short Circuit Withstand Time ($T_J \leq 150^{\circ}\text{C}$)	t_{sc}	10	μs
耗散功率 Power Dissipation	P_D $T_C=25^{\circ}\text{C}$	625	W
	P_D $T_C=100^{\circ}\text{C}$	250	W
最高结温 Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
存储温度 Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

热特性 **Electrical Characteristics**

项 目 Parameter	符 号 Symbol	数 值 Value	单位 Unit
IGBT结到管壳的热阻 Thermal Resistance, Junction to case for IGBT	$R_{th\ j-c}$	0.2	$^{\circ}\text{C}/\text{W}$
FRD结到管壳的热阻 Thermal Resistance, Junction to case for Diode	$R_{th\ j-c}$	0.4	$^{\circ}\text{C}/\text{W}$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th\ j-a}$	25	$^{\circ}\text{C}/\text{W}$

IGBT电特性 Electrical Characteristics of IGBT(T_c=25℃ unless otherwise noted)

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Units
集电极-发射极击穿电压 Collector-Emitter Breakdown Voltage	BV _{CES}	V _{GE} = 0V, I _C = 250uA	1200	-	-	V
零栅压下集电极漏电流 Collector-Emitter Leakage Current	I _{CES}	V _{CE} = 1200V, V _{GE} = 0V	-	-	100	uA
正向栅极体漏电流 Gate Leakage Current	I _{GES}	V _{GE} = ± 30V, V _{CE} = 0V	-	-	±100	nA
阈值电压 Gate Threshold Voltage	V _{GE(th)}	V _{GE} = V _{CE} , I _C = 250uA	4.5	-	6.5	V
饱和压降 Collector-Emmitter saturation Voltage	V _{CE(sat)}	I _C = 75A TC=25℃	1.45	1.85	2.30	V
		I _C = 150A TC=25℃		2.55		
		I _C = 75A TC=125℃		2.40		
		I _C = 75A TC=150℃		2.55		
栅极电荷总量 Total Gate Charge	Q _g	V _{CC} =600V V _{GE} =15V I _C =75A	-	270	-	nC
栅极-反射极 Gate to emitter charge	Q _{ge}		-	105	-	nC
栅极-集电极 Gate to collector charge	Q _{gc}		-	140	-	nC
开启延迟时间 Turn-On delay time	t _{d(on)}	V _{CC} =600V V _{GE} =15V I _C =75A R _G =15Ω Inductive Load T _C =25℃	-	168	-	ns
上升时间 Turn-On rise time	t _r		-	108	-	ns
关断延迟时间 Turn-Off delay time	t _{d(off)}		-	816	-	ns
下降时间 Turn-Off Fall time	t _f		-	119	-	ns
开通损耗 Turn-On energy	E _{on}		-	8.75	-	mJ
关断损耗 Turn-off energy	E _{off}		-	8.60	-	mJ
总开关损耗 Total switching energy	E _{tot}		-	17.35	-	mJ
输入电容 Input capacitance	C _{ies}	V _{CE} =25V V _{GE} =0V f = 1MHz	-	7350	-	pF
输出电容 Output capacitance	C _{oes}		-	320	-	pF
反向传输电容 Reverse transfer capacitance	C _{res}		-	40	-	pF

二极管电特性 Electrical Characteristics of Diode (T_c=25℃ unless otherwise noted)

正向压降 Diode Forward Voltage	V _F	I _F =75A	-	2.10	3.10	V
		I _F =75A TC=125℃		1.75		V
		I _F =75A TC=150℃		1.67		V
反向恢复时间 Diode Reverse Recovery Time	t _{rr}	V _{CE} = 600V I _F = 75A dI _F /dt = 100A/us	-	430		ns
反向恢复电流 Diode peak Reverse Recovery Current	I _{rr}		-	36.5		A
反向恢复电荷 Diode Reverse Recovery Charge	Q _{rr}		-	4.4		nC

Note1: Repetitive rating, pulse width limited by maximum junction temperature

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

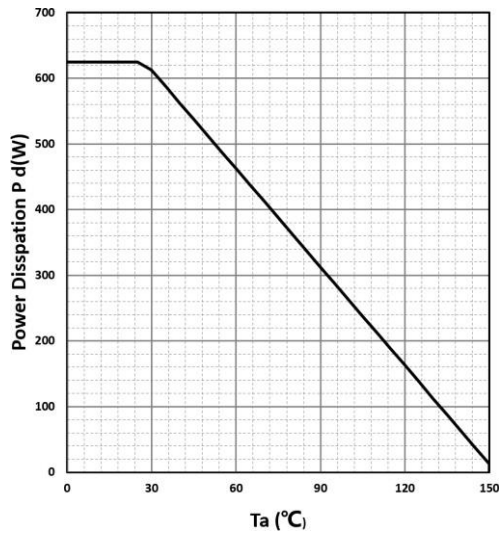


Figure1: power dissipation VS. case temperature

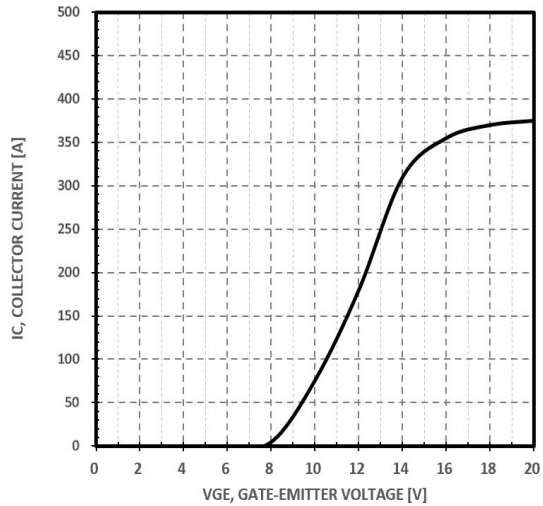


Figure2: VGE VS IC

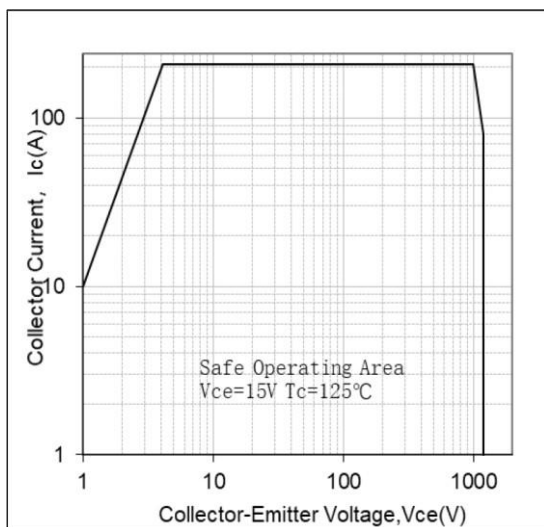


Figure3: reverse bias SOA, TJ=125°C, VGE=15V

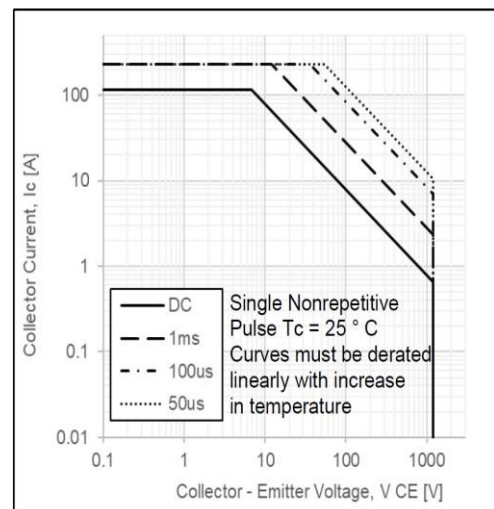


Figure4: forward SOA, TC=25°C, TJ≤150°C

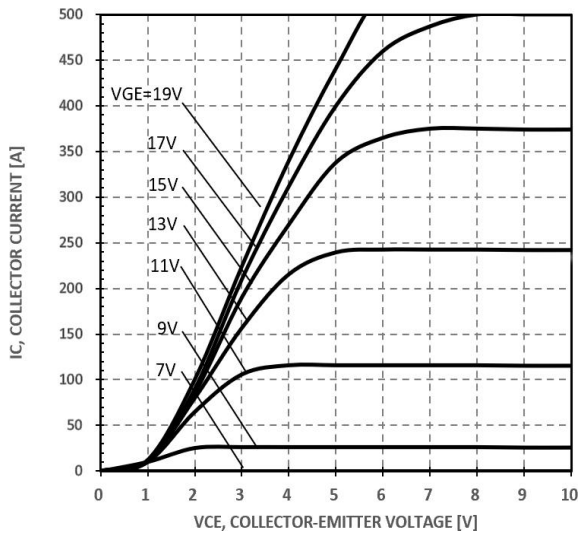


Figure5: typical IGBT output characteristics,
 $T_J=25^{\circ}\text{C}$

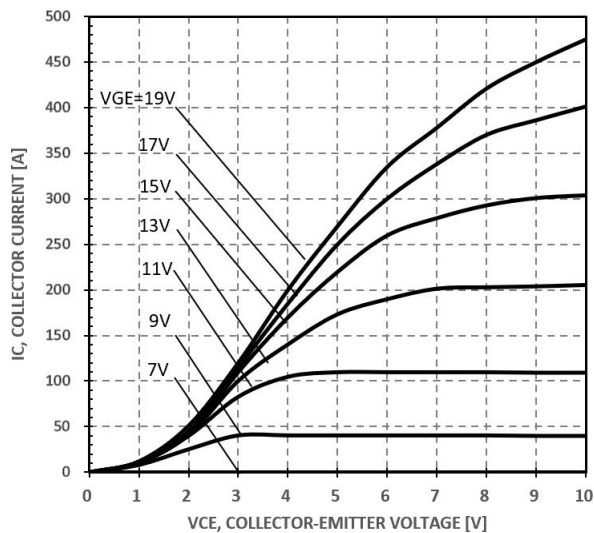


Figure6: typical IGBT output characteristics,
 $T_J=150^{\circ}\text{C}$

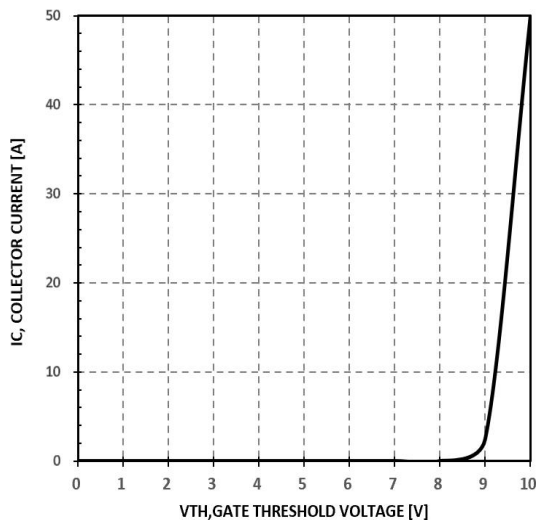


Figure7: gate threshold voltage

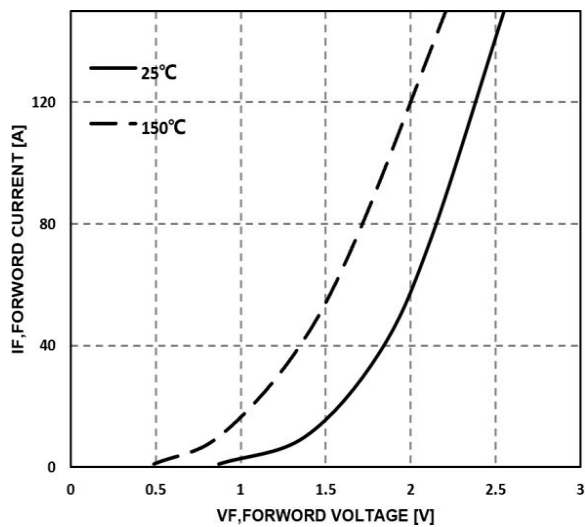


Figure8: typical diode forward characteristic

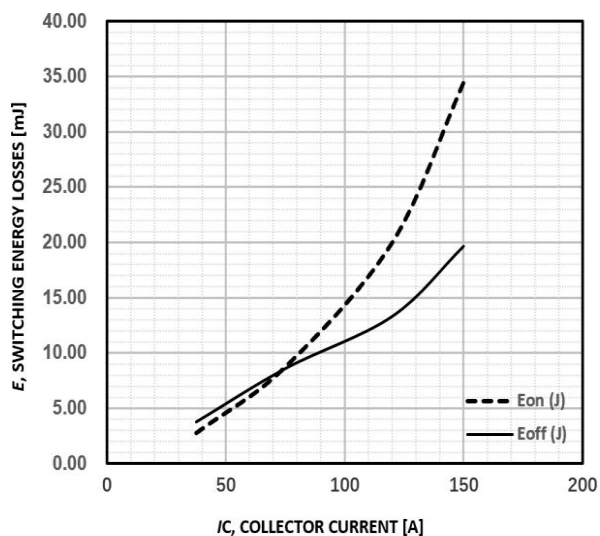


Figure9: typical energy loss VS. I_C , $T_C=25^{\circ}\text{C}$,
 $L=100\mu\text{H}$, $V_{CE}=600\text{V}$, $V_{GE}=15\text{V}$, $R_g=15\Omega$

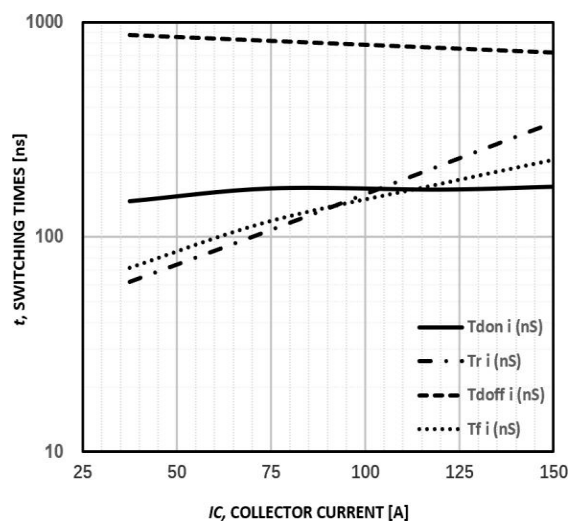


Figure10: typical switching time VS. I_C , $T_C=25^{\circ}\text{C}$,
 $L=100\mu\text{H}$, $V_{CE}=600\text{V}$, $V_{GE}=15\text{V}$, $R_g=15\Omega$

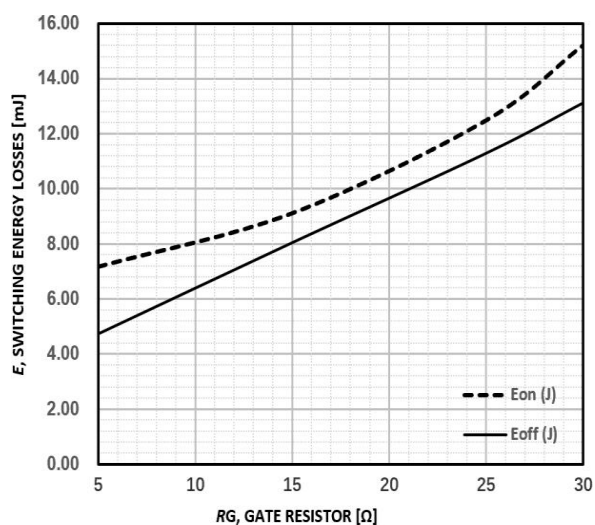


Figure11: typical energy loss VS. R_g , $T_C=25^{\circ}\text{C}$,
 $L=100\mu\text{H}$, $V_{CE}=600\text{V}$, $V_{GE}=15\text{V}$, $I_C=75\text{A}$

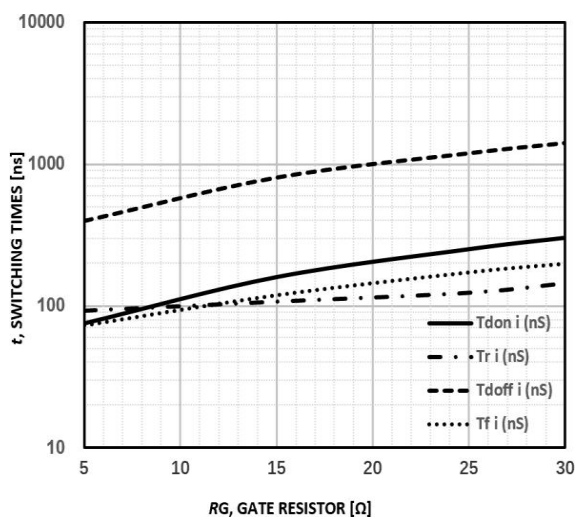


Figure12: typical switching time VS. R_g , $T_C=25^{\circ}\text{C}$,
 $L=100\mu\text{H}$, $V_{CE}=600\text{V}$, $V_{GE}=15\text{V}$, $I_C=75\text{A}$

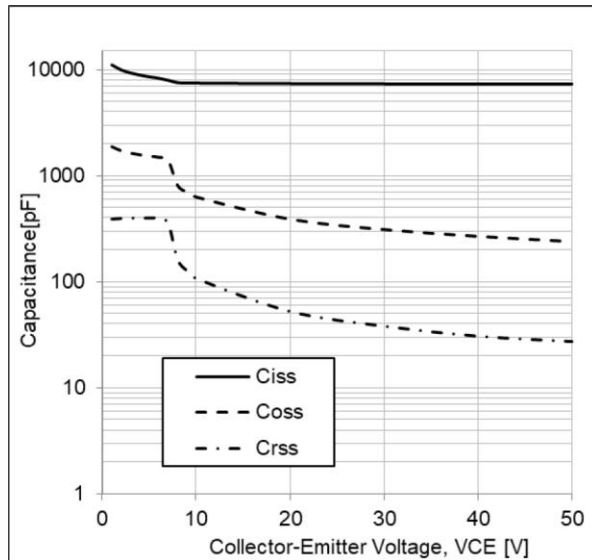


Figure13: typical capacitance VS. VCE,
VGE=0V, f=100kHz

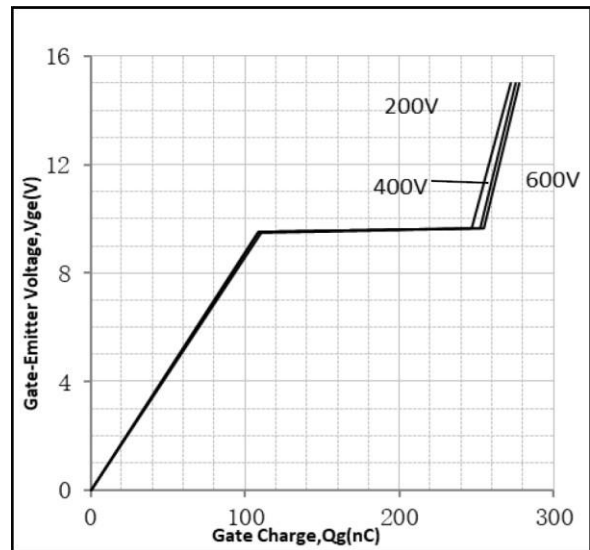
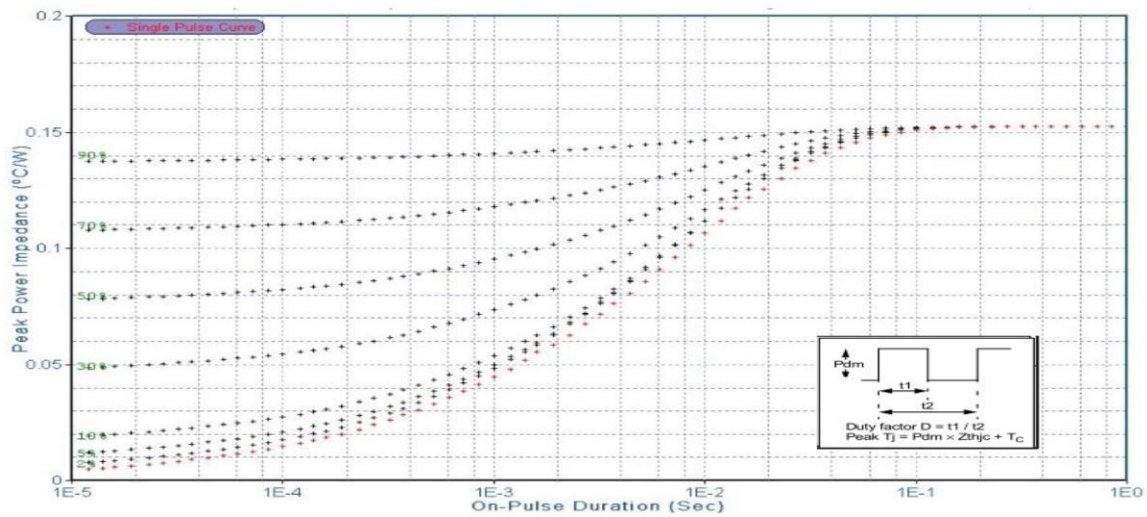


Figure14: typical gate charge VS. VGE, IC=75A

Figure15: normalized transient thermal impedance, junction-to-case

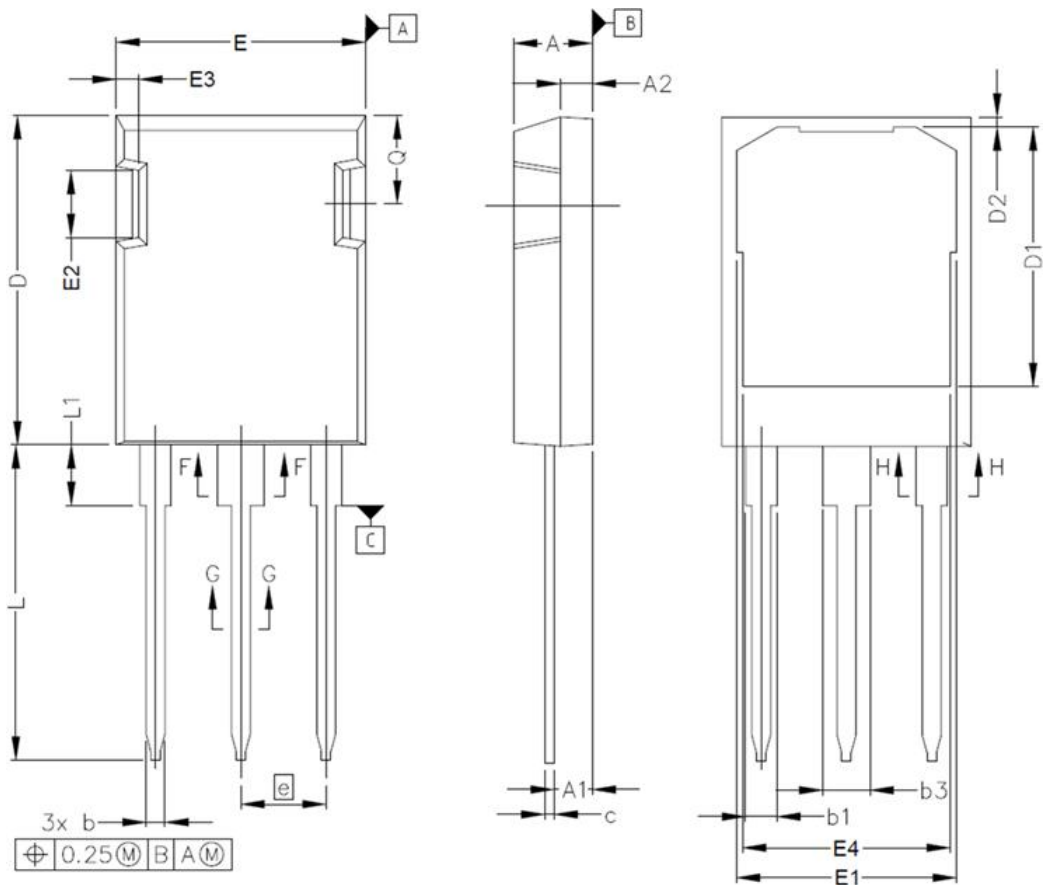
Note1. Duty factor $D = t_1 / t_2$

Note2: peak $T_J = P_{DM} \times Z_{thjc} + T_C$



外形尺寸 PACKAGE MECHANICAL DATA

TO-247-3L Plus



SYMBOL	MIN	MAX
A	4.83	5.21
A1	2.29	2.54
A2	1.91	2.16
b'	1.07	1.28
b	1.07	1.33
b1	1.91	2.41
b2	1.91	2.16
b3	2.87	3.38
b4	2.87	3.13
c'	0.55	0.65
c	0.55	0.68
D	20.80	21.10
D1	16.25	17.65
D2	0.50	0.80

SYMBOL	MIN	MAX
E	15.75	16.13
E1	13.10	14.15
E2	3.68	5.10
E3	1.00	1.90
E4	12.38	13.43
e	5.44 BSC	
N	3	
L	19.81	20.32
L1	3.70	4.00
Q	5.49	6.00