

**Key Parameters**

$V_{DS}$	2200 V
$I_D @ 25^\circ C$	81 A
$R_{DS(on)}$	40 m $\Omega$

# ANC040P220B4

**Silicon Carbide Power MOSFET**  
**N-Channel Enhancement Mode**

**Features**
**产品特点**

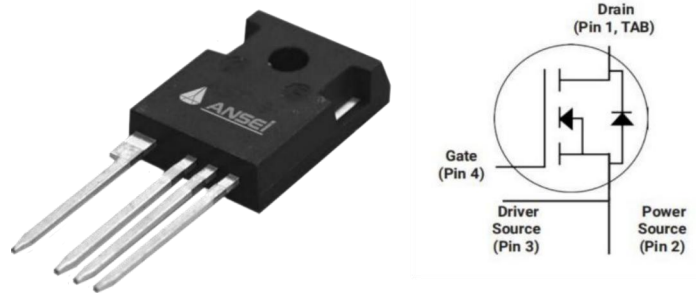
- |          |                          |
|----------|--------------------------|
| ● 高开关频率  | High Switching Frequency |
| ● 低开关损耗  | Low Switching Loss       |
| ● 软、快速开关 | Soft, fast Switching     |
| ● 易并联使用  | Easy Paralleling         |

**Benefits**

- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

**Applications**

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Motor Drivers
- Pulsed Power Applications

**Package**


Part Number	Package
ANC040P220B4	TO-247-4

**最大额定值**
**Maximum Ratings**

符号 Symbol	参数名称 Parameter	测试条件 Test Conditions	数值 Value	单位 Unit
$V_{DSmax}$	漏源极电压 Drain-source voltage	$V_{GS} = 0V, I_D = 100\mu A$	2200	V
$V_{GSS}$	栅源峰值电压 Gate-source voltage	$t_p \leq 500ns, \text{duty cycle} \leq 1\%$	-12/+22	V
$I_D$	持续正向电流, 由 $T_{vjmax}$ 限制 Continuous forward current, limited by $T_{vjmax}$	$V_{GS} = 18V, T_C = 25^\circ C$	81	A
$I_{DM}$	最大重复正向电流, 由 $T_{vjmax}$ 限制 Maximum repetitive forward current, limited by $T_{vjmax}$	Pulse with $t_p$ limited by $T_{jmax}$	120	A
$T_{vjmax}$	最大允许结温 Max. Junction temperature		175	$^\circ C$

$T_{vj(op)}$	工作结温 Operation junction temperature		-55...+175	°C
$T_{Proc}$	最大加工温度 Maximum processing temperature	最长持续时间 10min 10min, maximum	325	°C

**电特性值****Electrical Characteristics**除非特别声明, 否则  $T_{vj} = 25\text{ °C}$  $T_{vj} = 25\text{ °C}$  unless otherwise stated

符号 Symbol	参数名称 Parameter	测试条件 Test Conditions	最小值 Min.	典型值 Typ.	最大值 Max.	单位 Unit
$I_{DSS}$	零栅压漏极电流 Zero gate voltage drain current	$V_{GS} = 0V, V_{DS} = V_{DSS}$		1	50	uA
$I_{GSS}$	栅极漏电流 Gate leakage current	$V_{GS} = 18V, V_{DS} = 0V$			250	nA
$V_{GS(th)}$	栅极-源极阈值电压 Gate threshold voltage	$I_b = 12\text{ mA}, V_{GS} = V_{DS}$	2	3.1	4	V
$R_{DS(on)}$	漏极-源极通态电阻 Drain-source on-state resistance	$V_{GS} = 18V, I_b = 40A$		40		m
		$V_{GS} = 18V, I_b = 40A, T_{vj} = 175\text{ °C}$		95		m
$g_{fs}$	跨导 Forward transconductance	$V_{DS} = 20V, I_b = 40A$		23		S
$C_{iss}$	输入电容 Input capacitance	$V_{DS} = 1000V, V_{GS} = 0V,$ $f = 100kHz, V_{AC} = 25mV$		3794		pF
$C_{oss}$	输出电容 Output capacitance			195		pF
$C_{rss}$	反向传输电容 Reverse transfer capacitance			5.5		pF
$E_{oss}$	电容存储能量 $C_{oss}$ Stored Energy			230		pJ
$R_{Gint}$	内部栅极电阻 Internal gate resistor	$f = 1\text{ MHz}, V_{AC} = 25mV$		1.6		
$Q_{gs}$	栅源电荷 Gate to source charge	$I_b = 40A, V_{DS} = 1200V, V_{GS} = -4/+18V$		33		nC
$Q_{gd}$	栅漏电荷 Gate to drain charge			62		nC
$Q_g$	总栅极电荷 Total gate charge			178		nC
$V_{SD}$	二极管正向电压 Diode forward voltage	$I_{SD} = 20A, V_{GS} = -4V$		3.8		V
		$I_{SD} = 20A, V_{GS} = -4V, T_{vj} = 175\text{ °C}$		3.3		V

Typical Performance

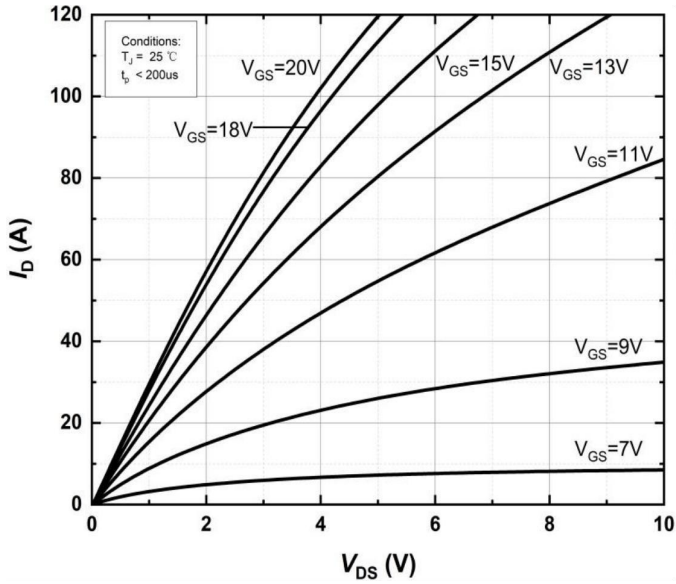


Figure 1. Output characteristics at Tj=25°C

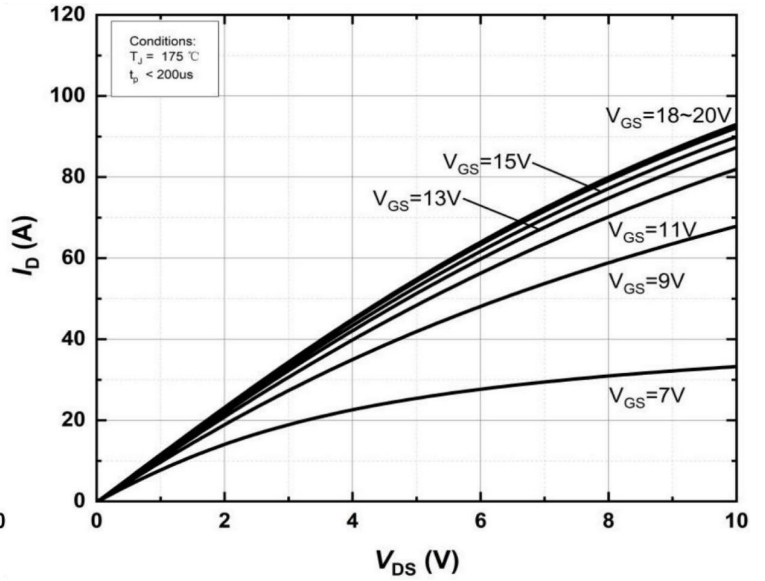


Figure 2. Output characteristics at Tj=175°C

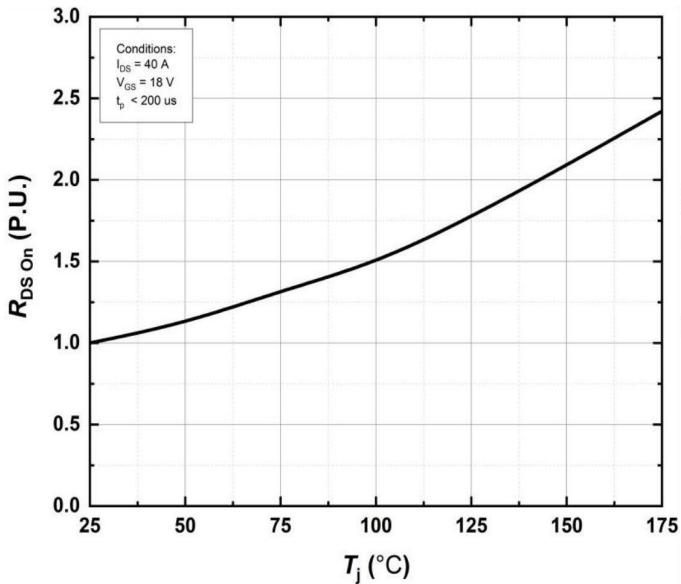


Figure 3. Normalized On-Resistance vs. Temperature

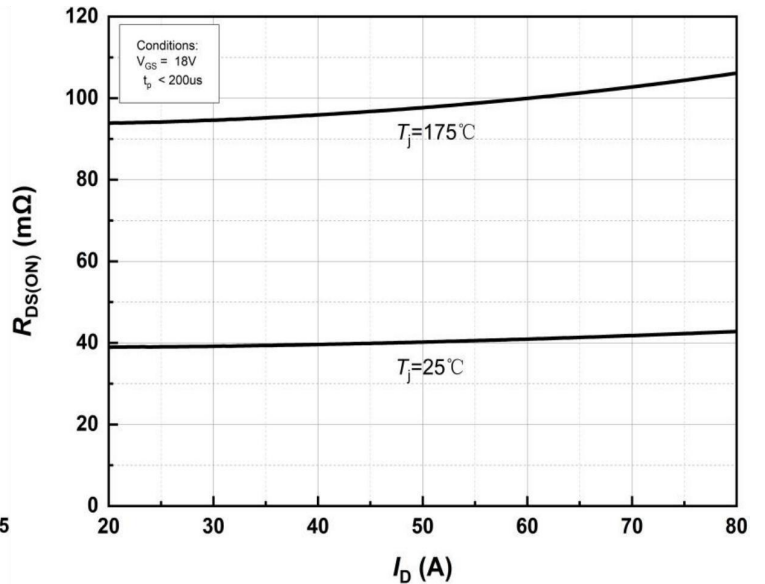


Figure 4. On-Resistance vs. Drain current for Various Temperature

Typical Performance

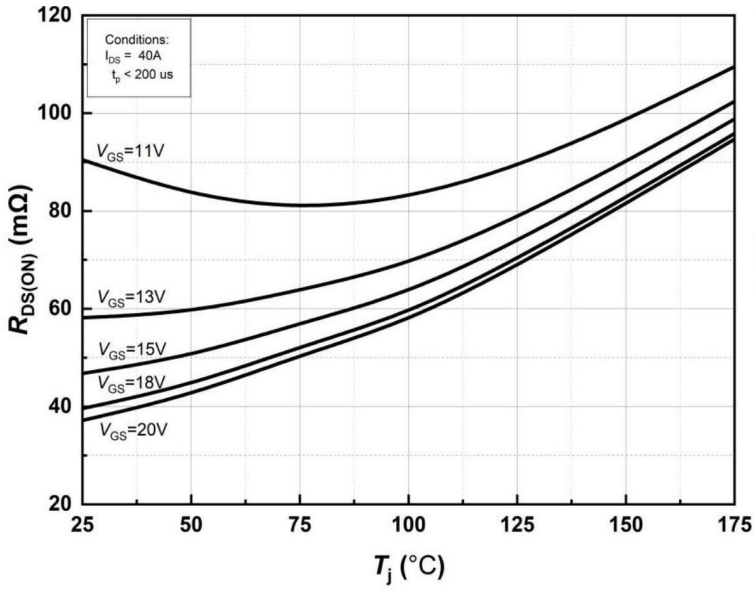


Figure 5. On-Resistance vs. Temperature Junction Temperatures

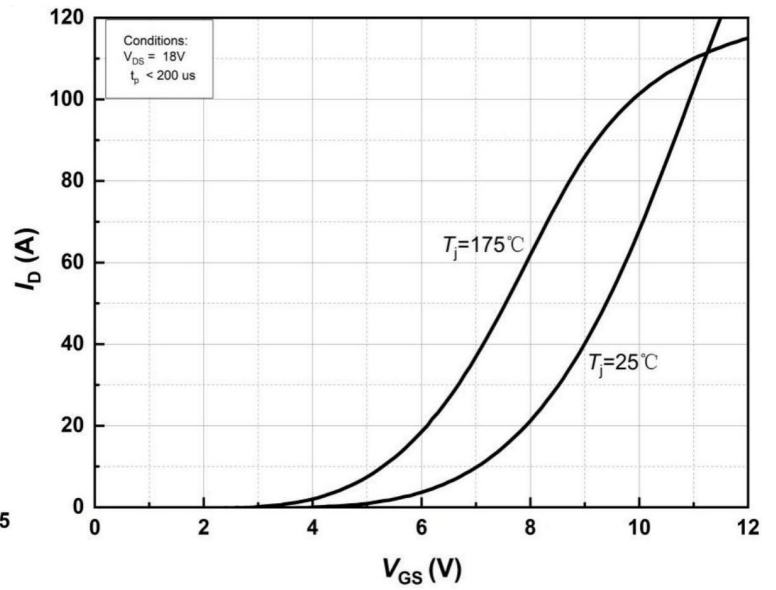


Figure 6. Transfer Characteristics for Various Gate Voltage

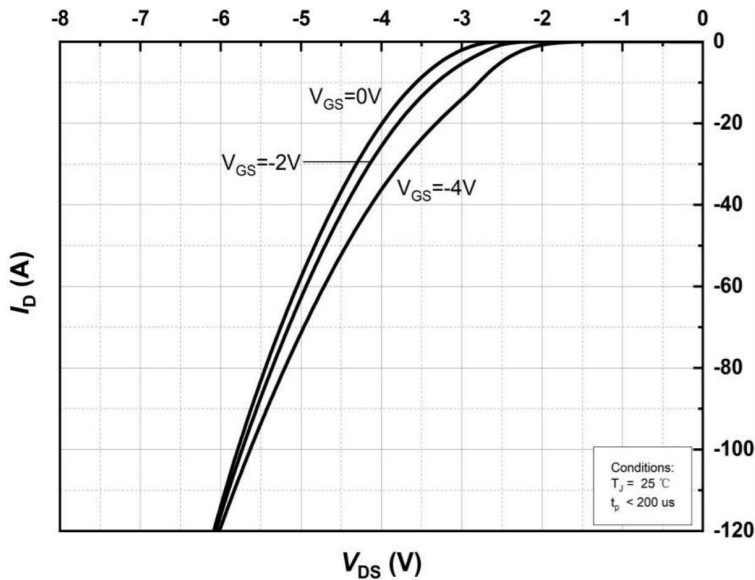


Figure 7. Body Diode Characteristics at Tj=25°C

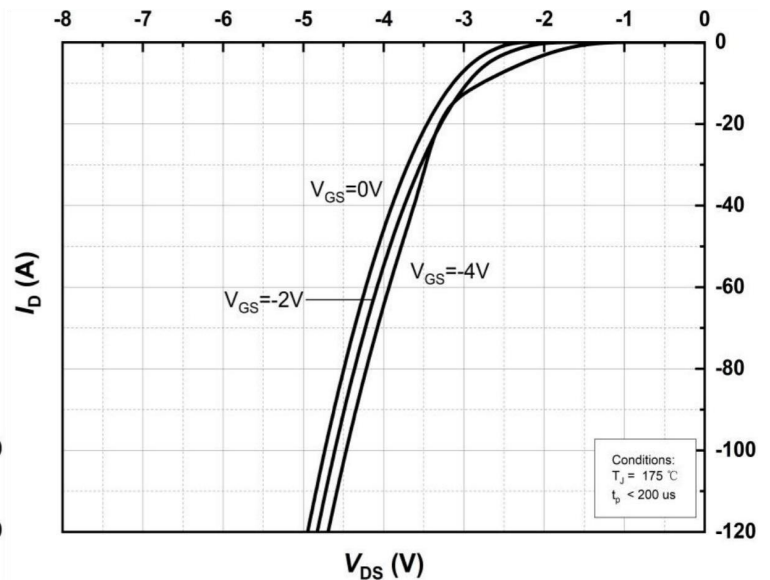
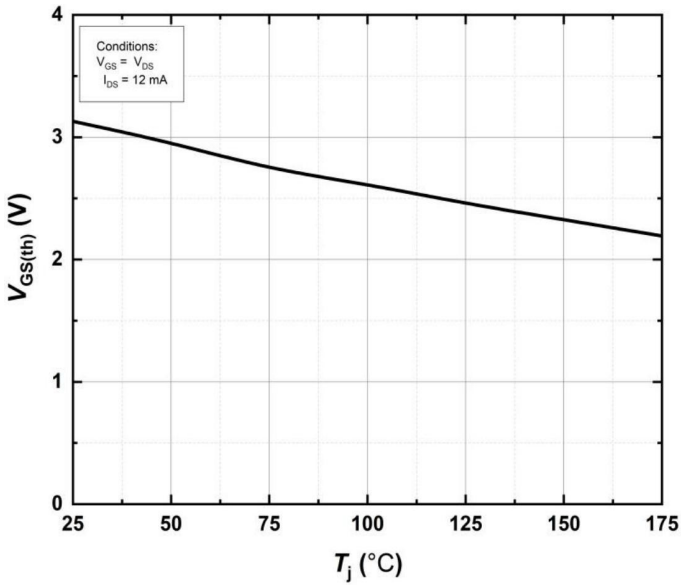
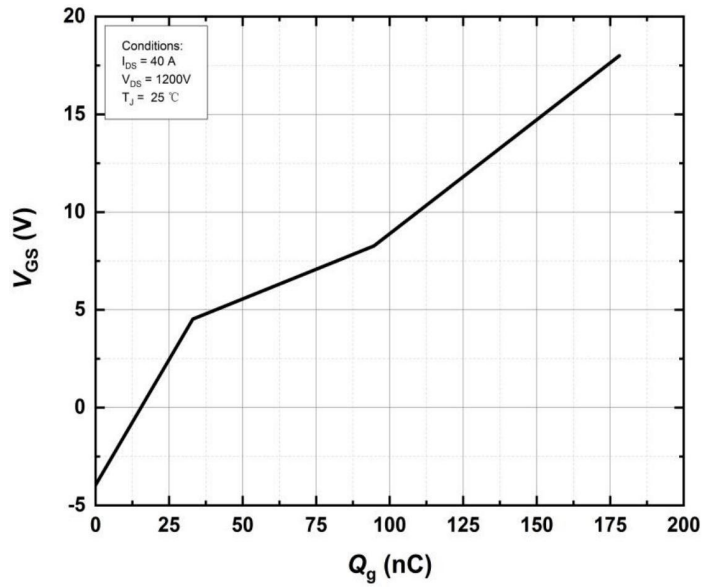


Figure 8. Body Diode Characteristics at Tj=175°C

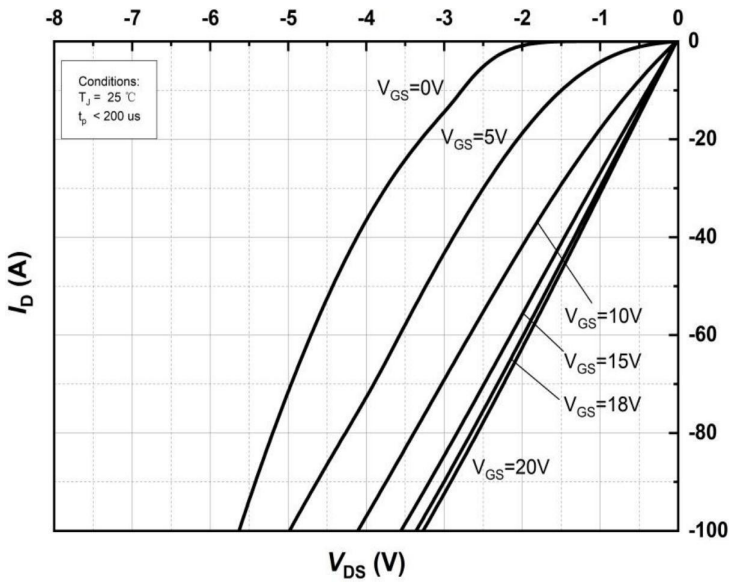
**Typical Performance**



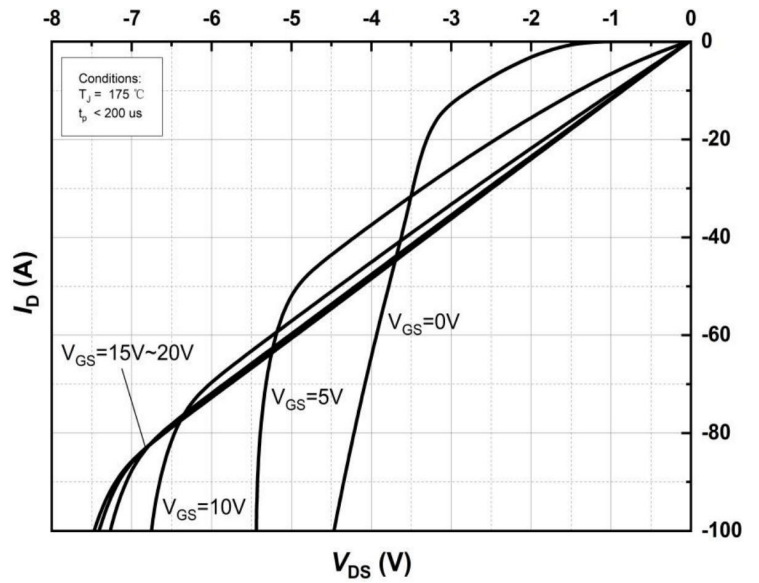
**Figure 9. Threshold Voltage vs. Temperature**



**Figure 10 Gate Charge Characteristics**



**Figure 11. 3rd Quadrant Characteristic at T<sub>j</sub>=25°C**



**Figure 12. 3rd Quadrant Characteristic at T<sub>j</sub>=175°C**

### Typical Performance

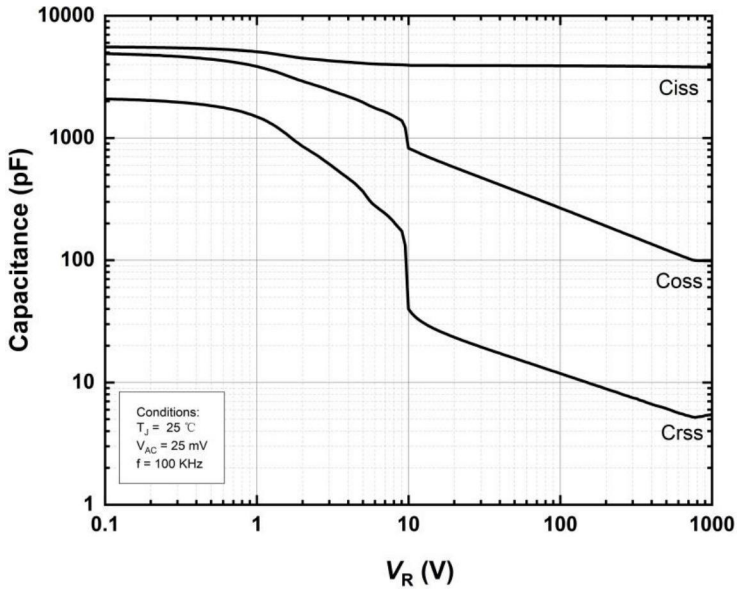


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 1000V)

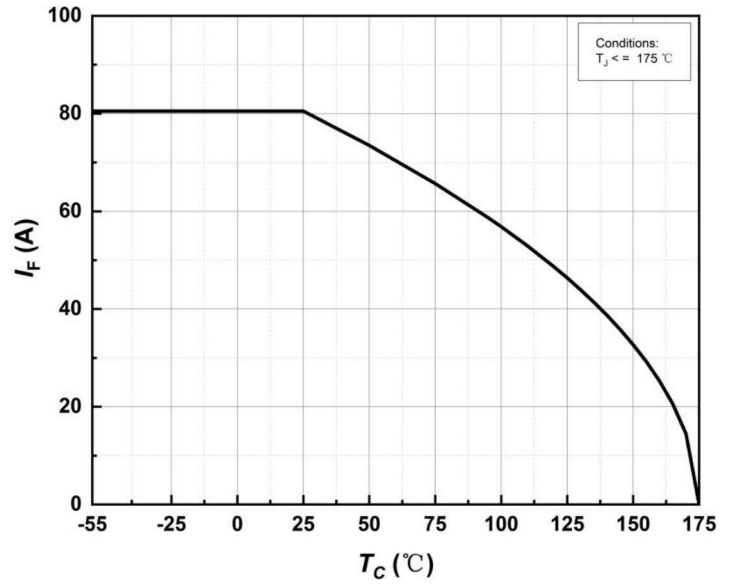


Figure 14. Continuous Drain Current Derating vs Case Temperature

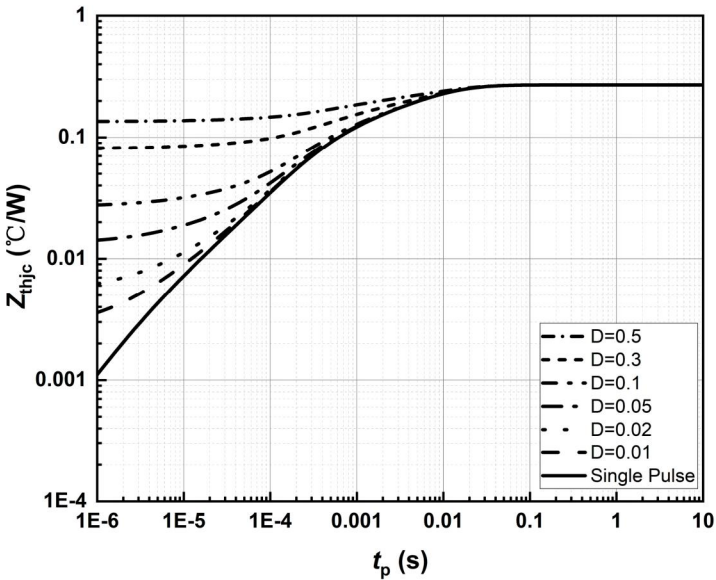


Figure 15. Transient Thermal Impedance (Junction – Case)

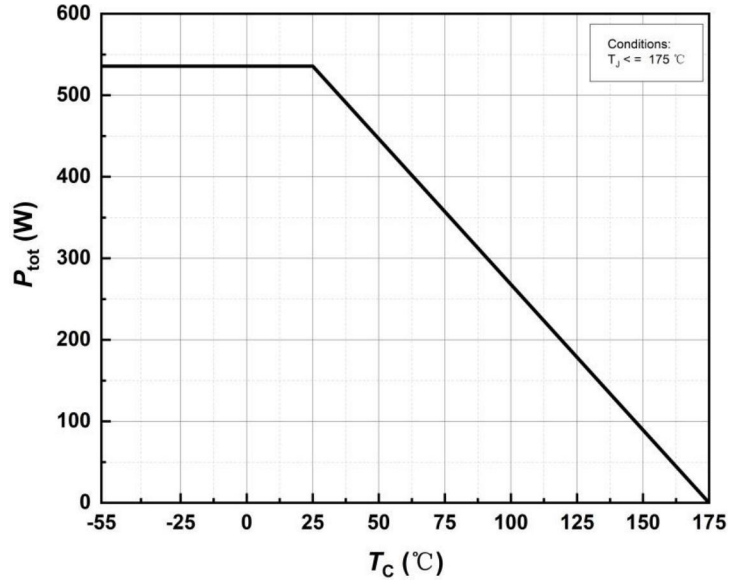
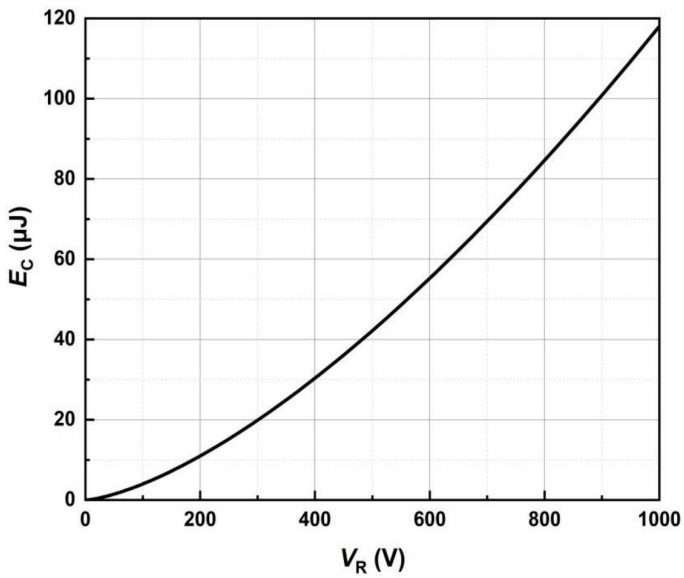
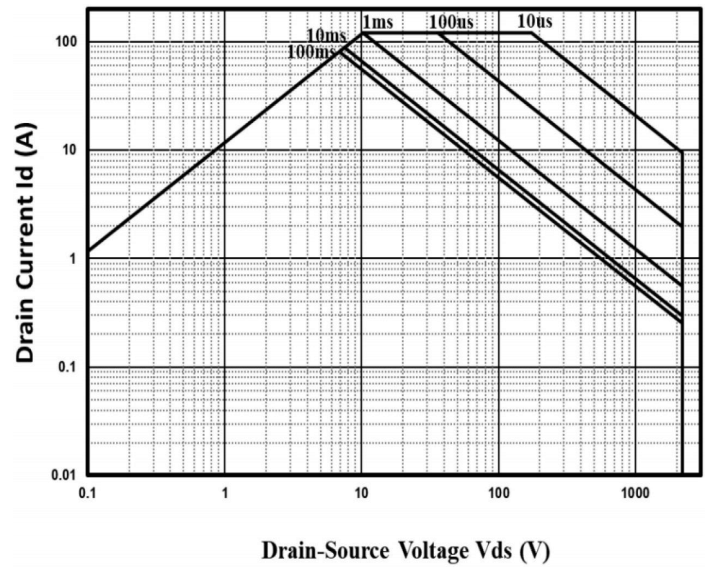
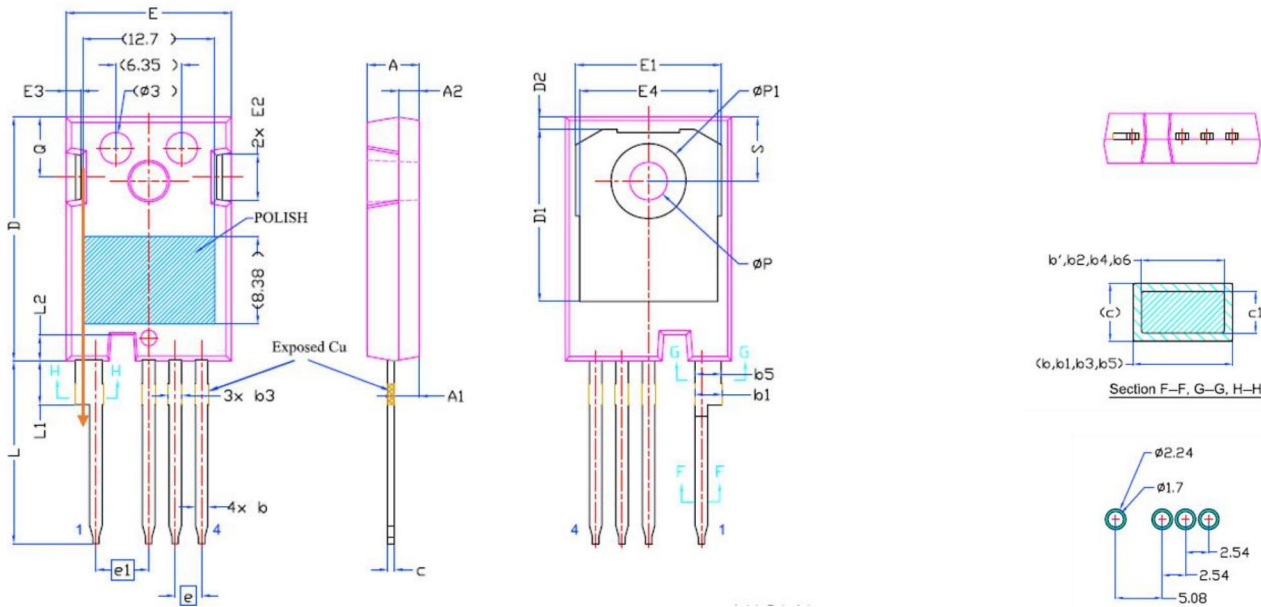
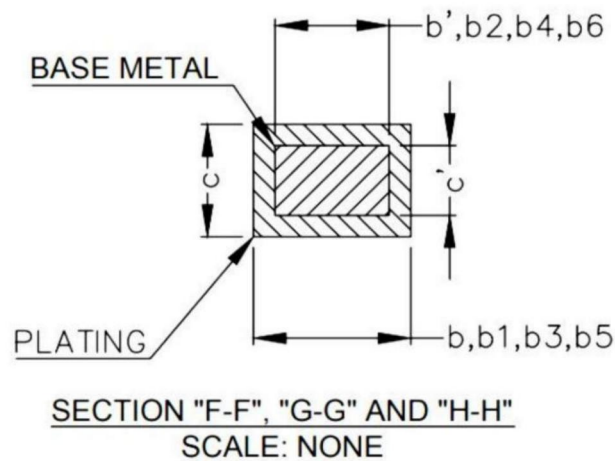


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

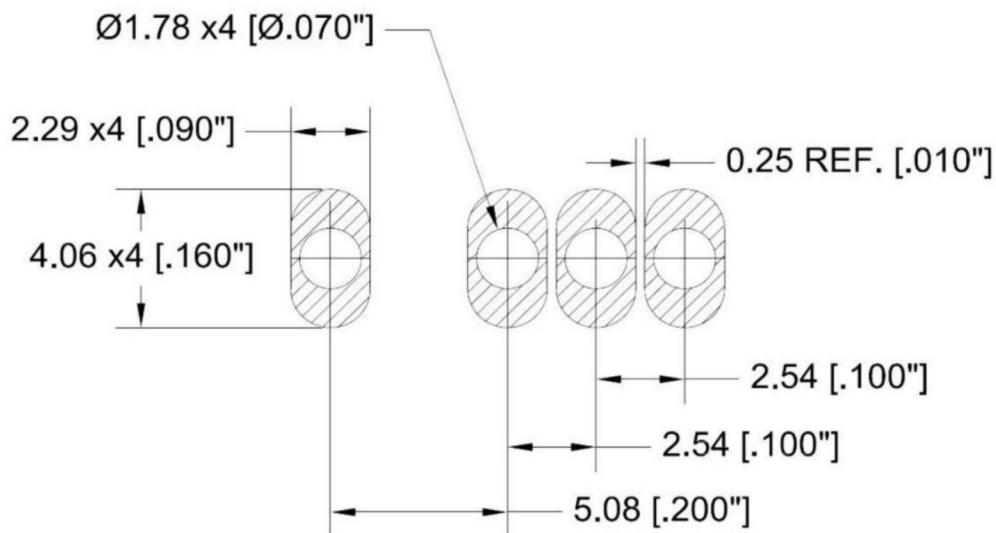
**Typical Performance**

**Figure 17. Output Capacitor Stored Energy**

**Figure 18. Safe Operating Area**

**Package Dimensions: TO-247-4L**


SYMBOL	MM		
	MIN	NOM	MAX
A	4.80	5.02	5.21
A1	2.29	2.41	2.54
A2	1.91	2.00	2.16
b'	1.07	1.20	1.28
b	1.07	1.20	1.33
b1	2.39	2.67	2.94
b2	2.39	2.67	2.84
b3	1.07	1.30	1.60
b4	1.07	1.30	1.50
b5	2.39	2.53	2.69
b6	2.39	2.53	2.64
c	0.55	0.60	0.68
c1	0.55	0.60	0.65
D	23.30	23.45	23.60
D1	16.25	16.55	17.65
D2	0.95	1.19	1.25
E	15.75	15.94	16.13
E1	13.10	14.02	14.15
E2	3.68	4.40	5.10
E3	1.00	1.45	1.90
E4	12.38	13.26	13.43
e	2.54BSC		
e1	5.08BSC		
L	17.31	17.57	17.82
L1	3.97	4.19	4.37
L2	2.35	2.50	2.65
ΦP	3.51	3.61	3.65
ΦP1	7.19REF.		
Q	5.49	5.79	6.00
S	6.04	6.17	6.30



### Recommended Solder Pad Layout



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