



# MG120R040

## 主要参数 MAIN CHARACTERISTICS

$I_D$	60A
$V_{CE}$	1200V
$R_{dson-typ}$ (@ $V_{gs}=18V$ )	35 m $\Omega$
$Q_g-typ$	128nC

### 用途

- 光伏逆变器
- 开关模式电源
- 高压 DC/DC 转换器
- 电池充电器
- 电动驱动
- 脉冲电源应用

### APPLICATIONS

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives
- Pulsed Power applications

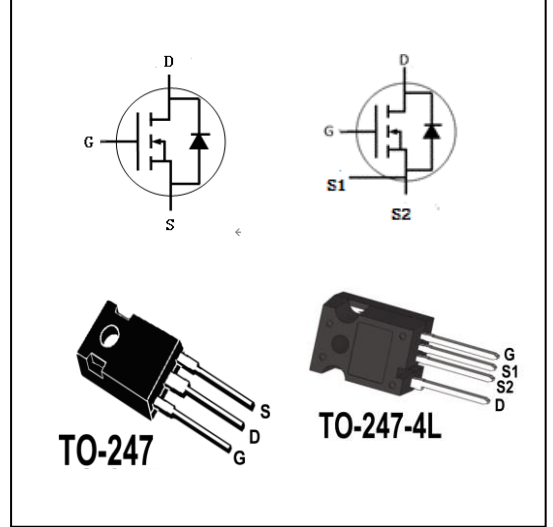
### 产品特性

- 高阻断电压
- 低导通电阻
- 低电容高速开关
- 易于驱动
- 雪崩强度高
- RoHS 产品

### FEATURES

- High Blocking Voltage
- Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness
- RoHS product

## 封装 Package



## 订货信息 ORDER MESSAGE

订货型号 Order codes	印记 Marking	封装 Package
无卤-条管 Halogen-Free-Tube		
MG120R040-GE-BR	MG120R040	TO-247
MG120R040-GH-BR	MG120R040	TO-247-4L



## 绝对最大额定值 ABSOLUTE RATINGS (Tc=25°C)

项 目 Parameter	符 号 Symbol	数 值 Value	单 位 Unit	测试条件 Tests conditions
最高漏极-源极直流电压 Drain-Source Voltage	V <sub>DSmax</sub>	1200	V	V <sub>GS</sub> =0V, I <sub>D</sub> =100μA
最高栅源电压 Gate-Source Voltage	V <sub>GSmax</sub>	-8/+20	V	Absolute maximum values
工作栅源电压 Gate-Source Voltage	V <sub>GSop</sub>	-5/+18	V	Recommended operational values
连续漏极电流 Drain Current -continuous	I <sub>D</sub>	60	A	V <sub>GS</sub> =20V, T <sub>C</sub> =25°C
		40	A	V <sub>GS</sub> =20V, T <sub>C</sub> =100°C
最大脉冲漏极电流 Drain Current - pulse	I <sub>DM</sub>	100	A	Pulse width limited by T <sub>jmax</sub>
耗散功率 Power Dissipation	P <sub>D</sub>	312	W	T <sub>C</sub> =25°C, T <sub>J</sub> =175°C
最高结温及存储温度 Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~+175	°C	
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T <sub>L</sub>	300	°C	





## 电特性 ELECTRICAL CHARACTERISTICS

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Units
漏-源击穿电压 Drain-Source Voltage	$BV_{DSS}$	$I_D=100\mu A, V_{GS}=0V$	1200	-	-	V
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=10mA, T_C=25^\circ C$	2.0	3.2	4	V
		$V_{DS} = V_{GS}, I_D=10mA, T_C=175^\circ C$		2		
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=1200V, V_{GS}=0V, T_C=25^\circ C$	-	1	100	$\mu A$
栅极体漏电流 Gate-body leakage current	$I_{GSS}$	$V_{DS}=0V, V_{GS} =20V$	-	50	200	nA
导通电阻 Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} =18V, I_D=33A, T_C=25^\circ C$	-	35	50	m $\Omega$
		$V_{GS} =18V, I_D=33A, T_C=175^\circ C$		58		m $\Omega$
跨导 Transconductance	$g_{fs}$	$V_{DS} = 20V, I_D=33A, T_J = 25^\circ C$	-	20	-	S
		$V_{DS} = 20V, I_D=33A, T_J =175^\circ C$		18.3		S
输入电容 Input capacitance	$C_{iss}$	$V_{DS}=1000V,$ $V_{GS} =0V,$ $f=1.0MHz,$ $V_{AC}=25mV$	-	3700	-	pF
输出电容 Output capacitance	$C_{oss}$		-	120	-	pF
反向传输电容 Reverse transfer capacitance	$C_{rss}$		-	22	-	pF
导通开关能量 Turn-On Switching Energy	$E_{ON}$	$V_{DS}=800V, V_{GS}=-5/18V, I_D= 33A,$ $R_{G(ext)} = 5\Omega, L= 80\mu H$	-	1.2	-	mJ
关断开关能量 Turn-Off Switching Energy	$E_{OFF}$		-	0.44	-	
延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{DD}=800V, V_{GS}=-5/18V$ $I_D =33A, R_{G(ext)} = 5\Omega,$ Timing relative to VDS	-	69	-	ns
上升时间 Turn-On rise time	$t_r$		-	140	-	ns
延迟时间 Turn-Off delay time	$t_{d(off)}$		-	50	-	ns
下降时间 Turn-Off Fall time	$t_f$		-	42	-	ns
栅电阻 Intrinsic gate resistance	$R_G$	$f = 1 MHz, V_{AC}=25mV$	-	2.1	-	$\Omega$
栅-源电荷 Gate-Source charge	$Q_{gs}$	$V_{DD}=800V, V_{GS}=-5/18V I_D = 33A$		40		nC
栅-漏电荷 Gate-Drain charge	$Q_{gd}$			37		
栅极电荷总量 Total Gate Charge	$Q_g$			28		





## 漏-源二极管特性 Drain-Source Diode Characteristics

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	典型 Typ	最大 Max	单位 Units
正向压降 Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS} = -5V, I_{SD} = 20 A, T_J = 25\text{ }^\circ\text{C}$	3.6		V
		$V_{GS} = -5V, I_{SD} = 20 A, T_J = 175\text{ }^\circ\text{C}$	3.3		V
正向最大连续电流 Maximum Continuous Drain -Source Diode Forward Current	$I_S$	$T_C = 25\text{ }^\circ\text{C}$	-	60	A
反向恢复时间 Reverse recovery time	$t_{rr}$		37		ns
反向恢复电荷 Reverse recovery charge	$Q_{rr}$	$V_{GS} = -5V, I_{SD} = 33 A, V_R = 800V,$ $dif/dt = 1200A/\mu s$	165		nC
峰值反向恢复电流 Peak Reverse Recovery Current	$I_{rrm}$		16		A

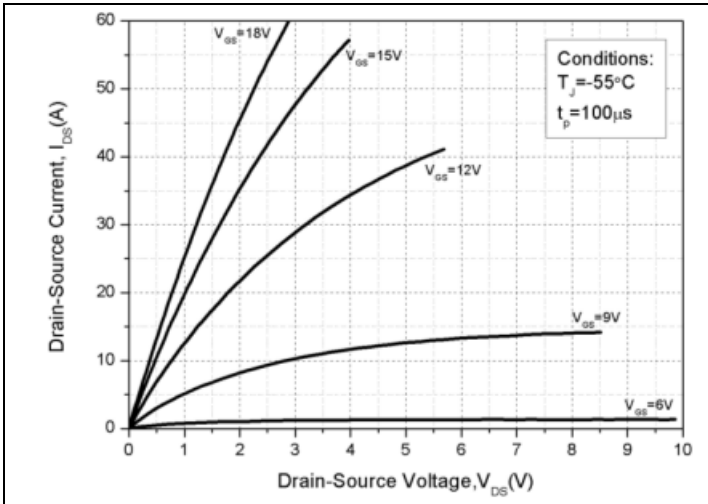
## 热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	典型 Typ	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.48	$^\circ\text{C/W}$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	42	$^\circ\text{C/W}$

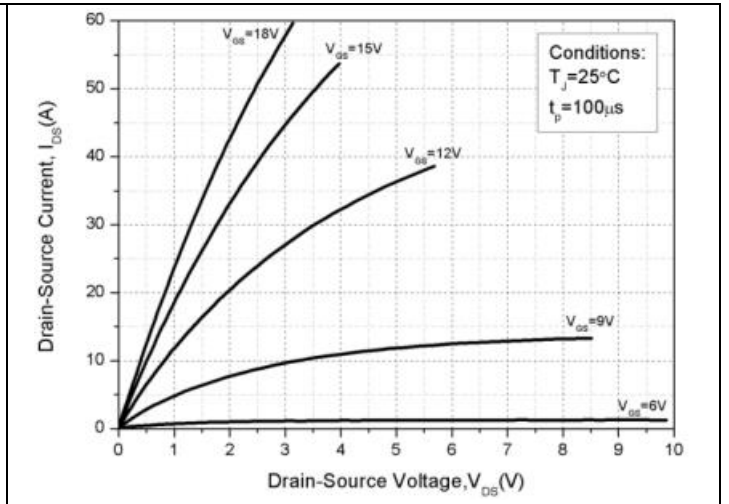




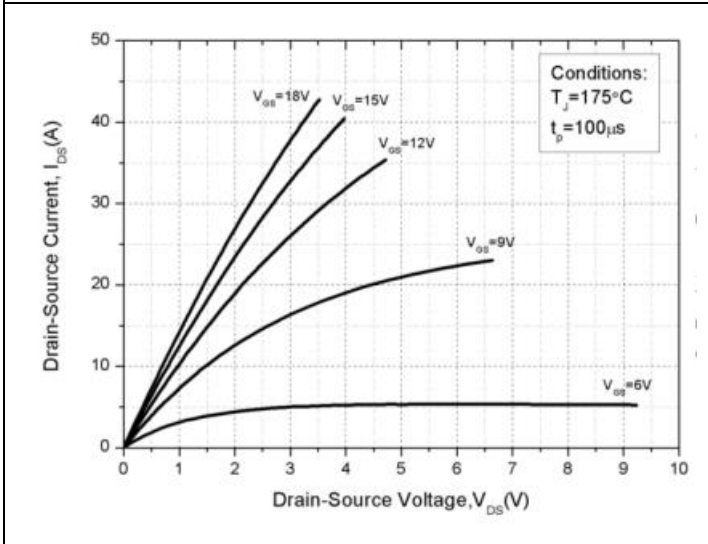
典型性能 Typical Performance



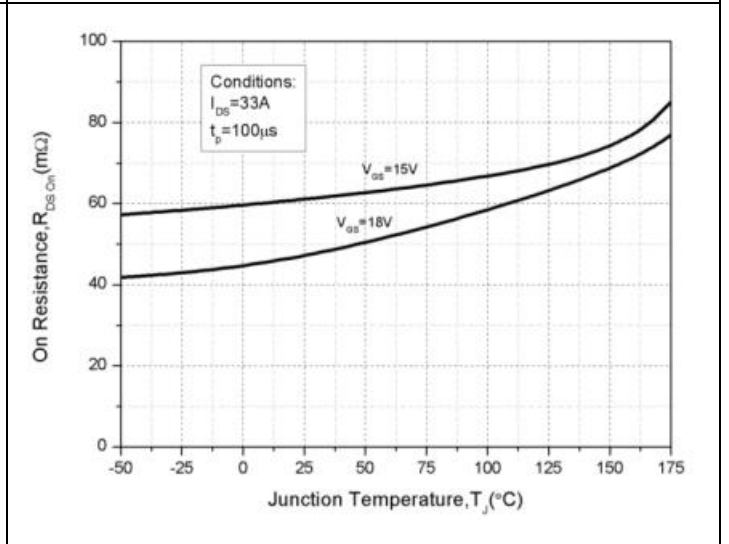
Output Characteristics  $T_J = -55^\circ\text{C}$



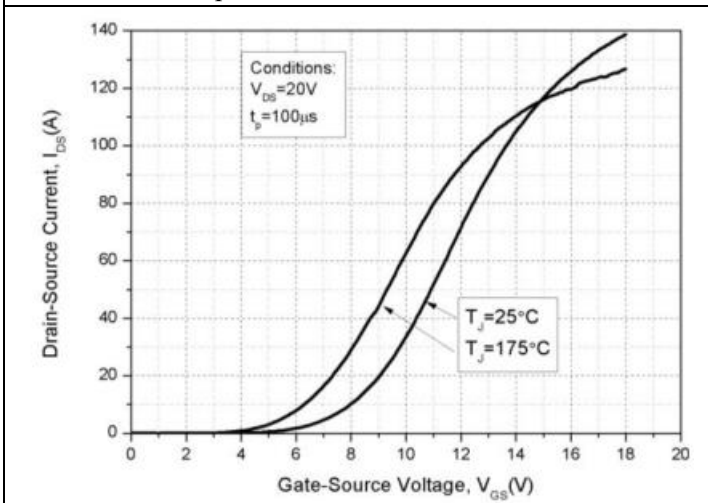
Output Characteristics  $T_J = 25^\circ\text{C}$



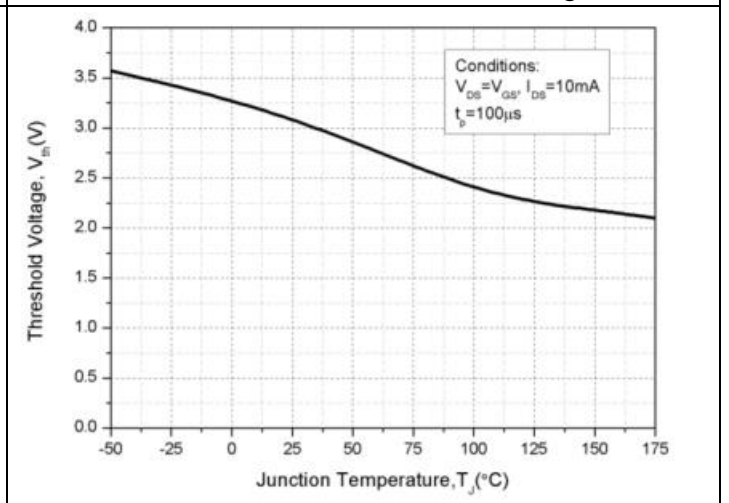
Output Characteristics  $T_J = 175^\circ\text{C}$



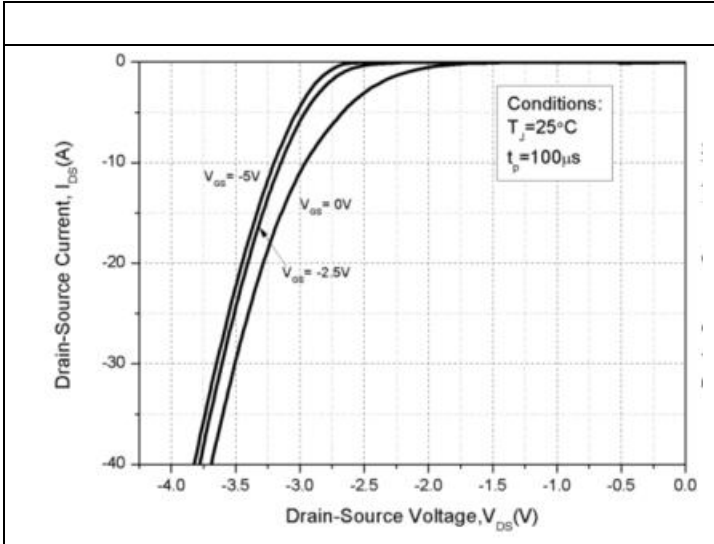
On-Resistance For Various Gate Voltage



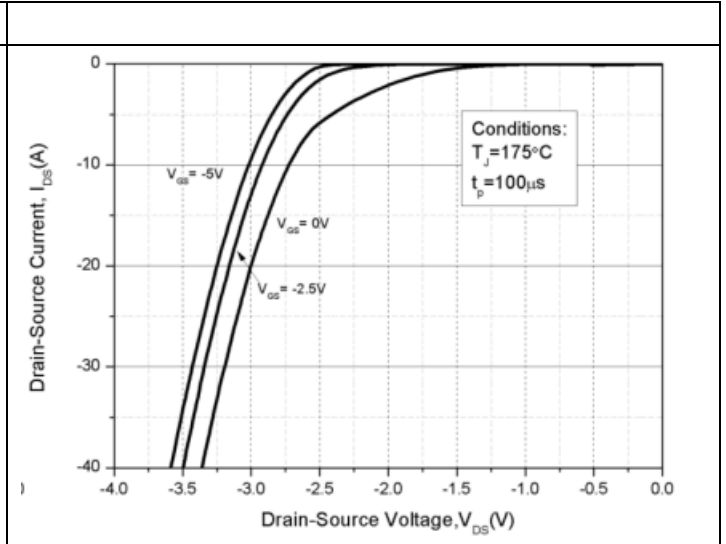
Transfer Characteristic



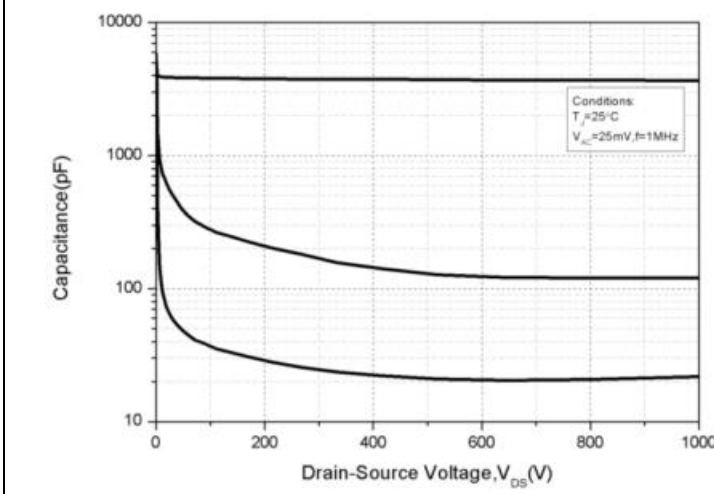
Threshold Voltage vs. Temperature or Various Junction Temperatures



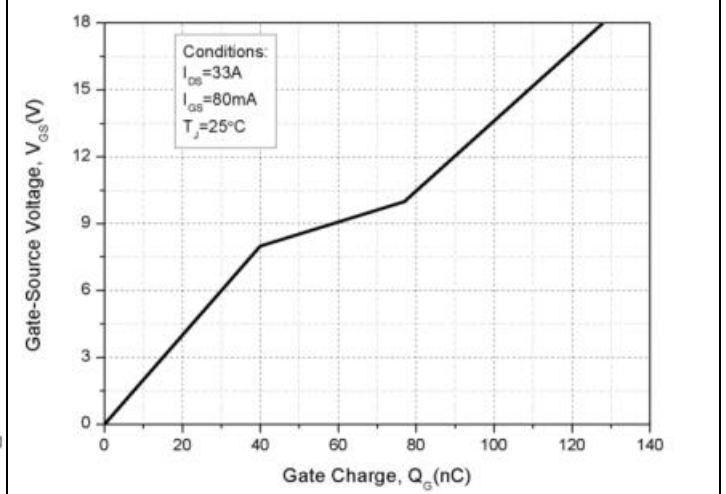
Body Diode Characteristics,  $T_J = 25^\circ\text{C}$



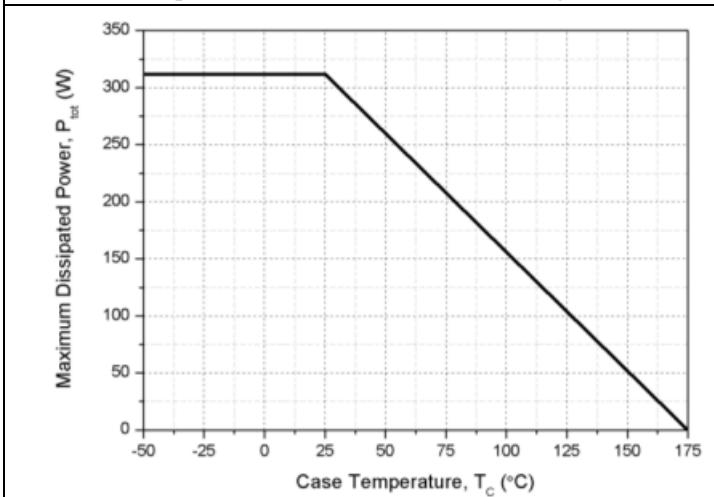
Body Diode Characteristics,  $T_J = 175^\circ\text{C}$



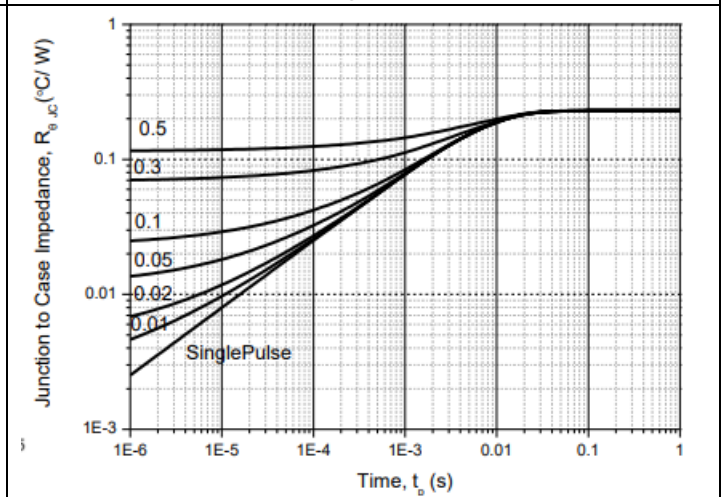
Capacitances vs. Drain-Source Voltage



Gate Charge Characteristics



Power Dissipation Derating



Transient Thermal Impedance

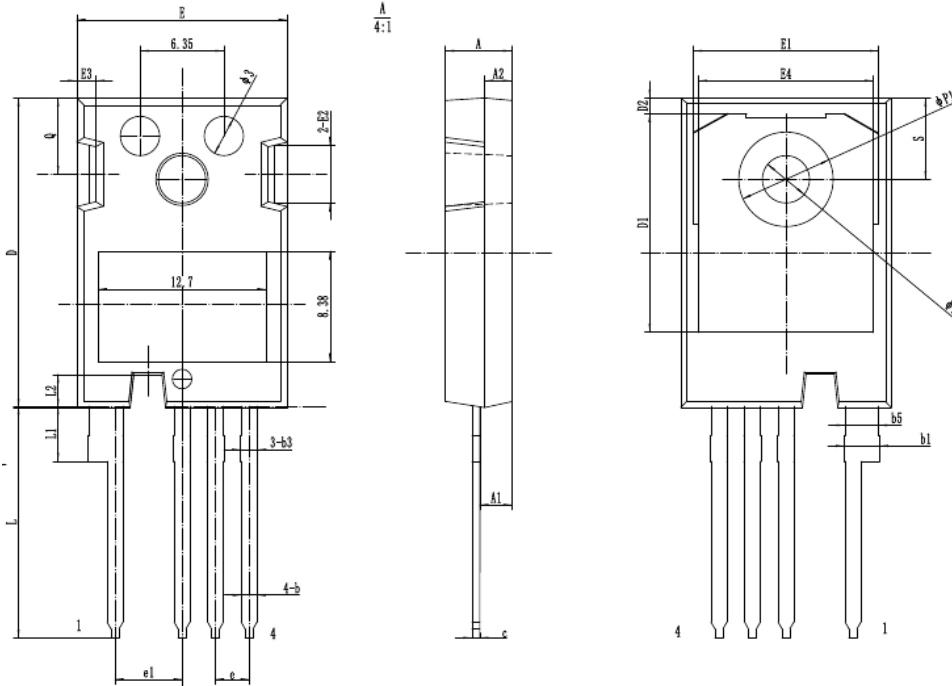




外形尺寸 PACKAGE MECHANICAL DATA

TO-247-4L

单位 Unit: mm

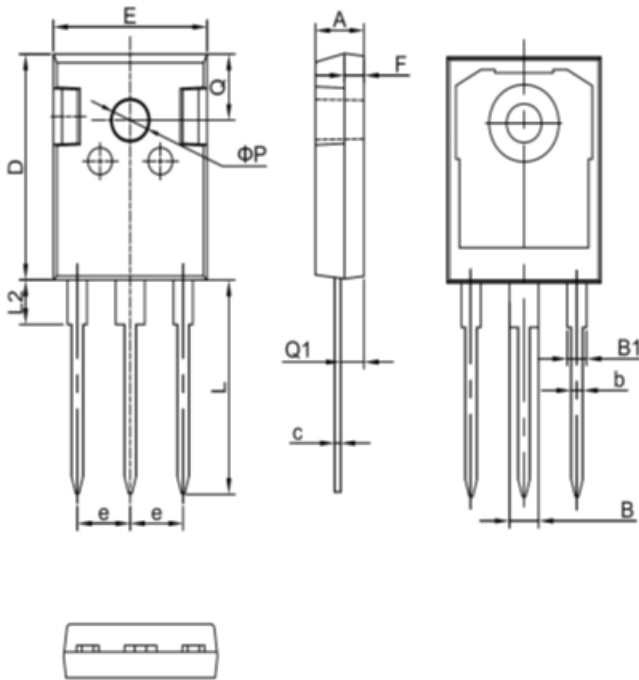


SYMBOL	mm		
	MIN	NOM	MAX
*A	4.83	5.02	5.21
A1	2.29	2.41	2.54
A2	1.91	2.00	2.16
*b	1.07	1.20	1.33
b1	2.39	2.67	2.94
b3	1.07	1.30	1.60
b5	2.39	2.53	2.69
*c	0.55	0.60	0.68
*D	23.30	23.45	23.60
D1	16.25	16.55	17.65
D2	0.95	1.19	1.25
*E	15.75	15.94	16.13
E1	13.10	14.02	14.15
E2	3.68	4.40	5.10
E3	1.00	1.45	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	2.30	2.50	2.65
*P	3.51	3.61	3.65
*P1		7.19REF	
*Q	5.49	5.79	6.00
S	6.04	6.17	6.30



## TO-247

单位 Unit: mm



符号 symbol	MIN	MAX
A	4.90	5.10
B	2.95	3.35
B1	1.95	2.35
b	1.15	1.35
c	0.50	0.70
D	20.90	21.10
E	15.70	15.90
e	5.34	5.54
F	1.90	2.10
L	19.40	20.40
L2	4.03	4.23
Q	6.00	6.40
Q1	2.30	2.50
P	3.50	3.70

←







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