



MG170R045

主要参数 MAIN CHARACTERISTICS

I_D	58A
V_{CE}	1700V
$R_{dson-typ}$ (@ $V_{GS}=18V$)	50m Ω
Q_g-typ	131nC

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

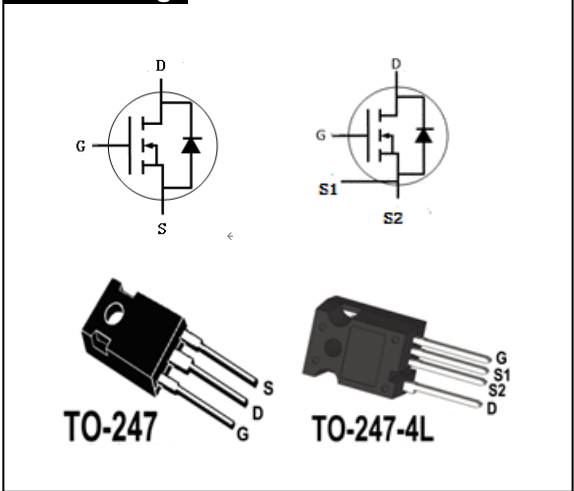
产品特性

- 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		
MG170R045-GE-BR	MG170R045	TO-247
MG170R045-GH-BR	MG170R045	TO-247-4L



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	测试条件 Tests conditions
最高漏极-源极直流电压 Drain-Source Voltage	V_{DSmax}	1700	V	$V_{GS}=0V, I_D=100\mu A$
最高栅源电压 Gate-Source Voltage	V_{GSmax}	-8/+22	V	Absolute maximum values
工作栅源电压 Gate-Source Voltage	V_{GSop}	-5/+18	V	Recommended operational values
连续漏极电流 Drain Current -continuous	I_D	58	A	$T_c=25^{\circ}\text{C}$
		41	A	$T_c=100^{\circ}\text{C}$
最大脉冲漏极电流 Drain Current - pulse	I_{DM}	220	A	
耗散功率 Power Dissipation	P_D	455	W	$T_c=25^{\circ}\text{C}, T_J=175^{\circ}\text{C}$
最高结温及存储温度 Operating and Storage Temperature Range	T_J, T_{STG}	-55~+175	$^{\circ}\text{C}$	
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	300	$^{\circ}\text{C}$	





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}	$I_D=1mA, V_{GS}=0V$	1700	-	-	V
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=10mA, T_C=25\text{ }^{\circ}C$	2.2	3.2	4.2	V
		$V_{DS} = V_{GS}, I_D=10mA, T_C=175\text{ }^{\circ}C$		2.4		
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=1700V, V_{GS}=0V, T_C=25\text{ }^{\circ}C$	-	10	100	μA
栅极体漏电流 Gate-body leakage current	I_{GSS+}	$V_{DS}=0V, V_{GS}=+22V$	-	-	100	nA
栅极体漏电流 Gate-body leakage current	I_{GSS-}	$V_{DS}=0V, V_{GS}=-8V$	-	-	100	nA
导通电阻 Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=18V, I_D=40A, T_C=25\text{ }^{\circ}C$	-	50	62	m Ω
		$V_{GS}=18V, I_D=40A, T_C=175\text{ }^{\circ}C$		109		m Ω
输入电容 Input capacitance	C_{iss}	$V_{DS}=1200V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	2951	-	pF
输出电容 Output capacitance	C_{oss}		-	80	-	pF
反向传输电容 Reverse transfer capacitance	C_{rss}		-	6.4	-	pF
导通开关能量 Turn-On Switching Energy	E_{ON}	$V_{DS}=1200V, V_{GS}=-5/18V, I_D=40A$	-	1518	-	μJ
关断开关能量 Turn-Off Switching Energy	E_{OFF}		-	426	-	
延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{DD}=1200V, V_{GS}=-5/18V$ $I_D=40A, R_G=5.1\Omega$	-	37	-	ns
上升时间 Turn-On rise time	t_r		-	19	-	ns
延迟时间 Turn-Off delay time	$t_{d(off)}$		-	30	-	ns
下降时间 Turn-Off Fall time	t_f		-	14	-	ns
栅电阻 Intrinsic gate resistance	R_G	$f=1\text{ MHz}, I_D=0A$	-	2.0	-	Ω
栅—源电荷 Gate-Source charge	Q_{gs}	$V_{DD}=1200V, V_{GS}=-5/18V, I_D=40A$		131		nC
栅—漏电荷 Gate-Drain charge	Q_{gd}			44		
栅极电荷总量 Total Gate Charge	Q_g			15		





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}	$V_{GS} = -5V, I_{SD} = 20A, T_J = 25^\circ C$	3.7		V
		$V_{GS} = -5V, I_{SD} = 20A, T_J = 175^\circ C$	3.4		V
正向最大连续电流 Maximum Continuous Drain -Source Diode Forward Current	I_{SD}	$T_C = 25^\circ C$ $T_C = 100^\circ C$	-	100 57	A
反向恢复时间 Reverse recovery time	t_{rr}		53		ns
反向恢复电荷 Reverse recovery charge	Q_{rr}	$V_{GS} = -5V, I_{SD} = 40A, V_R = 1200V,$ $dif/dt = 1000A/\mu s$	201		nC
峰值反向恢复电流 Peak Reverse Recovery Current	I_{rrm}		8.8		A

I_{SD} is limited by bonding wires.

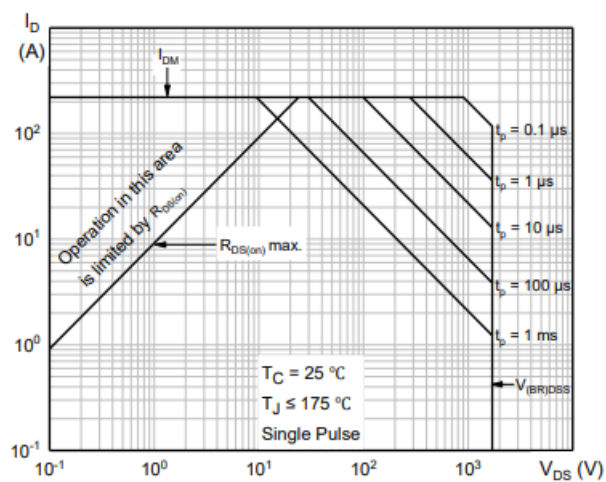
热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	典型 Typ	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.33	$^\circ C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	40	$^\circ C/W$

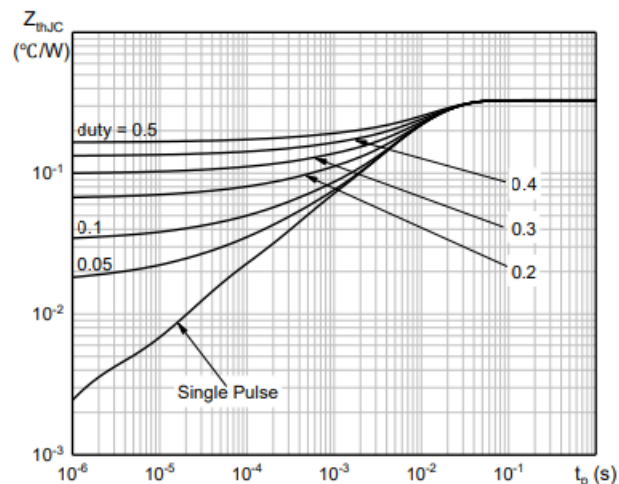




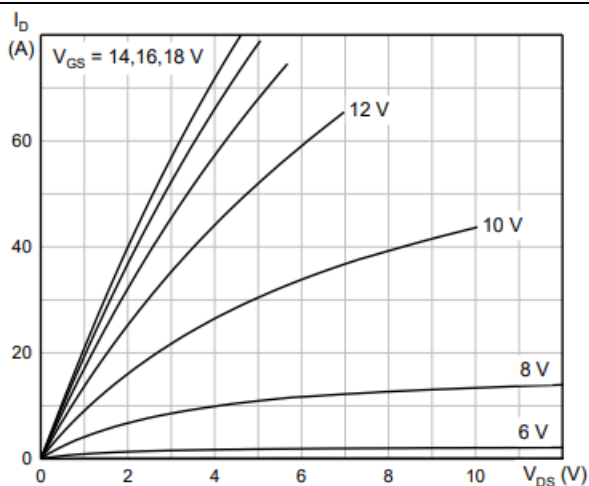
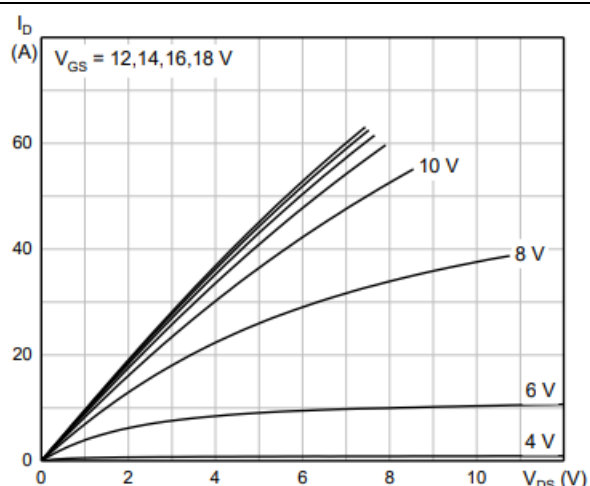
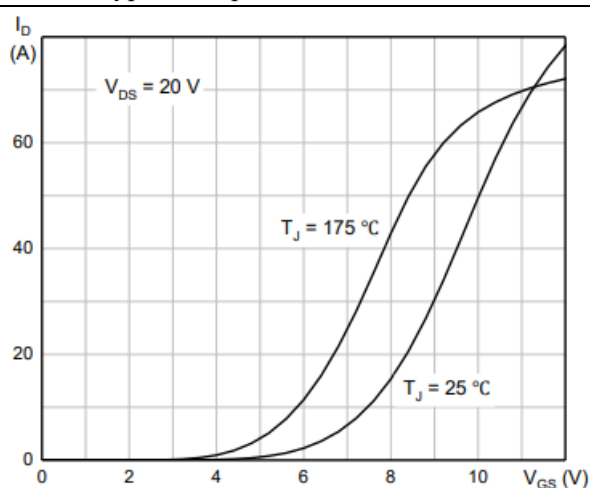
典型性能 Typical Performance



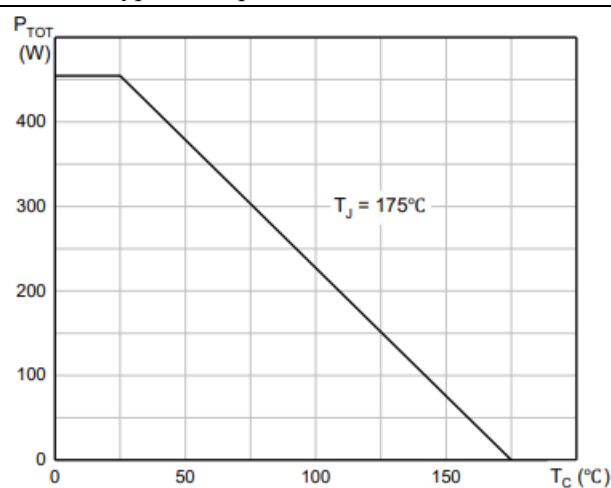
Safe Operating Area



Maximum Transient Thermal Impedance

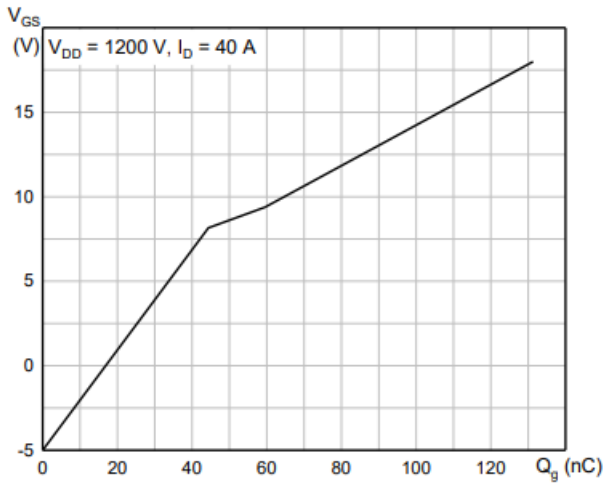
Typical Output Characteristics, T_J = 25°CTypical Output Characteristics, T_J = 175°C

Typical Transfer Characteristics

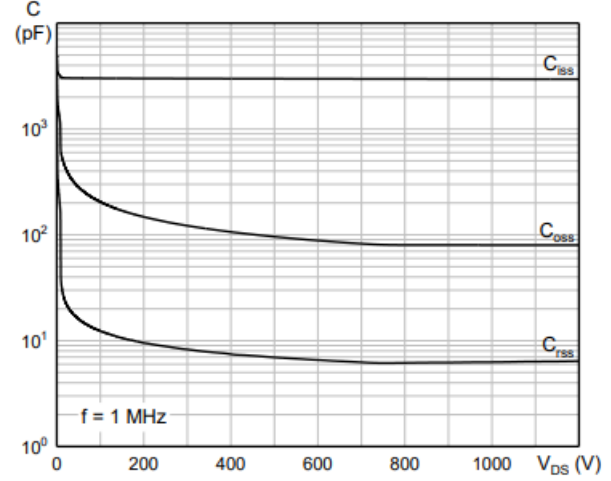


Total Power Dissipation

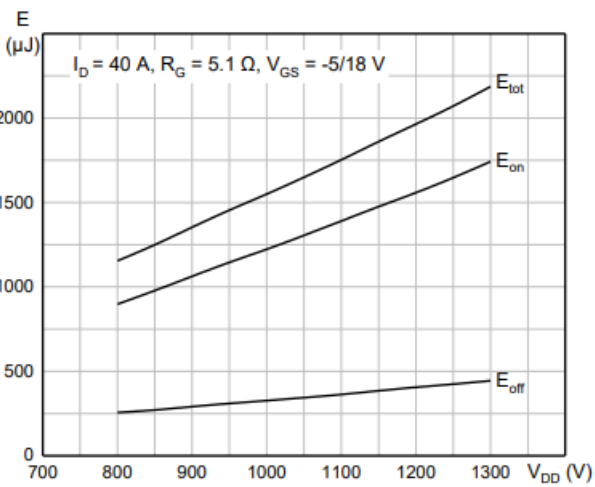




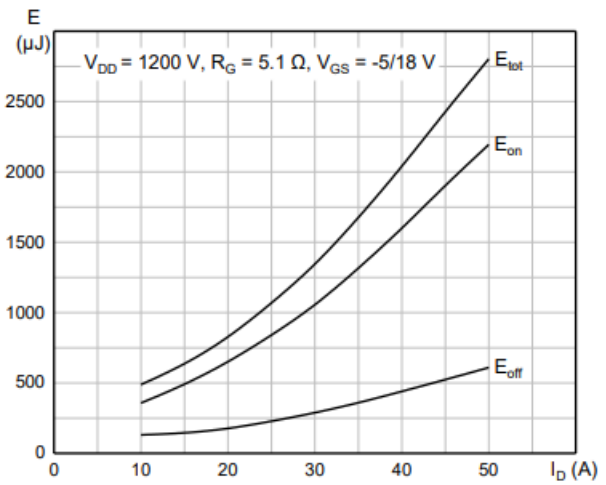
Typical Gate Charge Characteristics



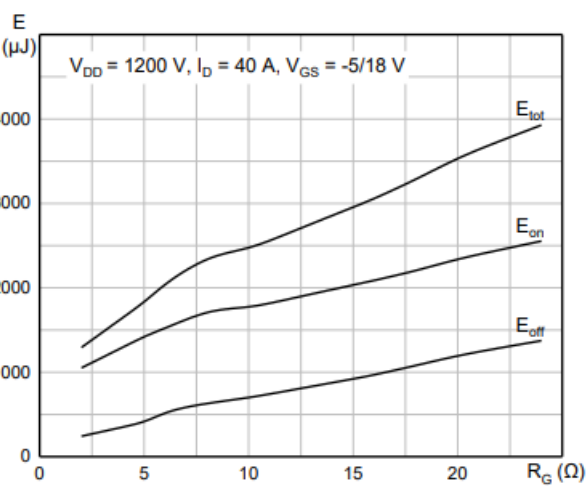
Typical Capacitance Characteristics



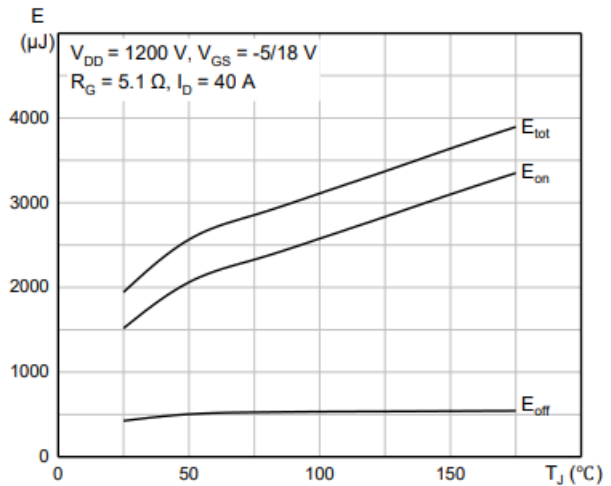
Typical Switching Energy vs. Supply Voltage



Typical Switching Energy vs. Drain Current

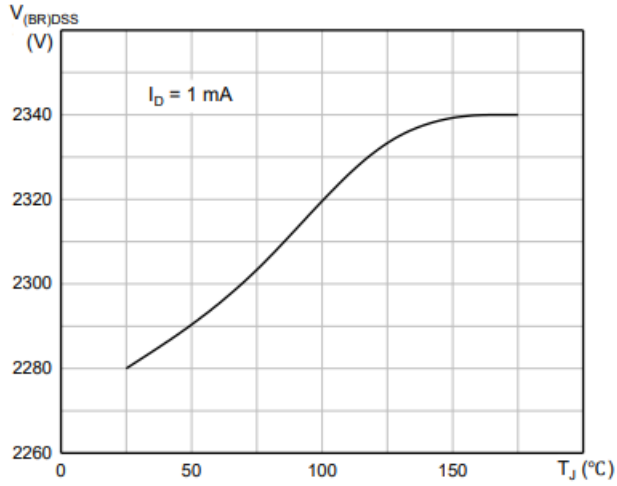


Typical Switching Energy vs. Gate Resistance

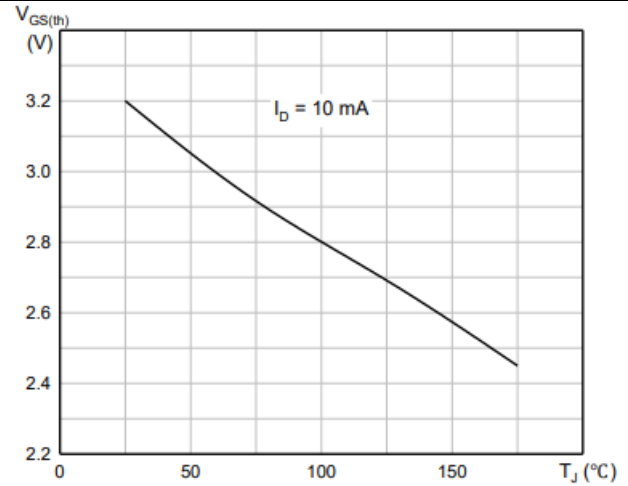


Typical Switching Energy vs. Temperature

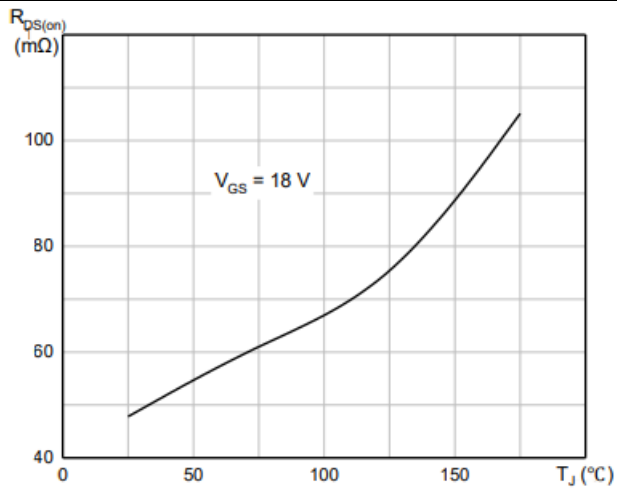




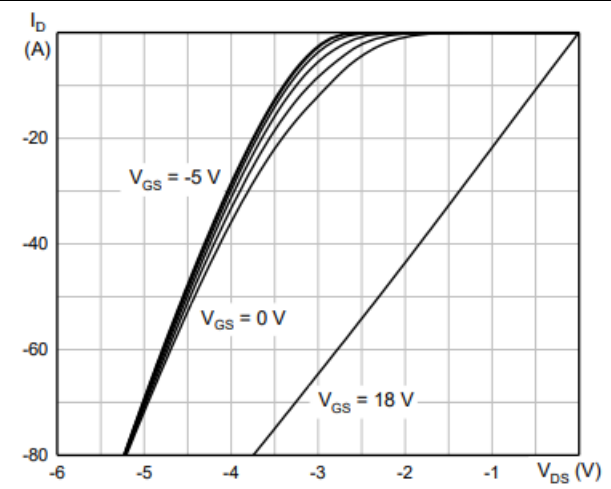
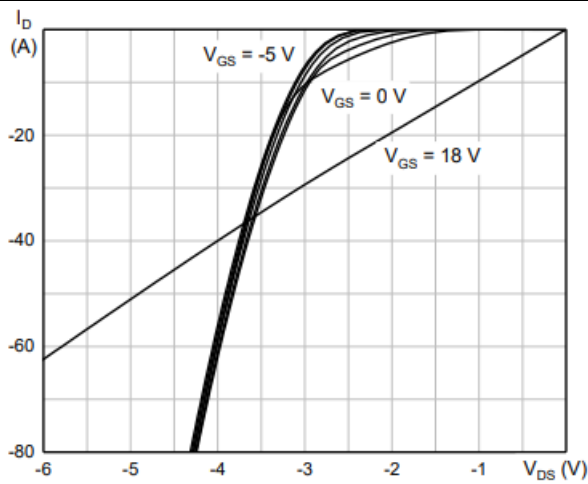
Breakdown Voltage vs. Temperature



Gate Threshold vs. Temperature

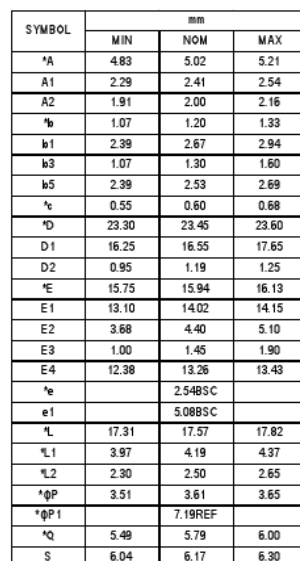


On-Resistance vs. Temperature

Body Diode Characteristics, $T_J = 25^{\circ}\text{C}$ Body Diode Characteristics, $T_J = 175^{\circ}\text{C}$ 

**TO-247-4L**

单位 Unit: mm

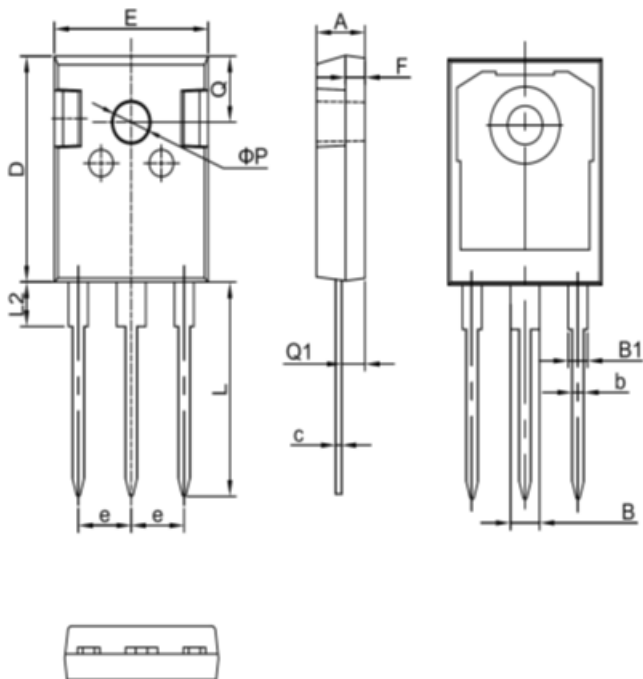




外形尺寸 PACKAGE MECHANICAL DATA

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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