LGE3M50120Q

Silicon Carbide Power MOSFET

V_{DS} = 1200 V
I_D@25°C = 58A
$R_{DS(ON)}$ = 50mΩ

Features

- High voltage, low on resistance
- High speed, low parasitic capacitance
- High junction temperature
- Fast recovery diode
- Kelvin connection driver

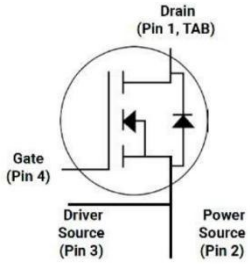
Benefits

- Higher System Efficiency
- Parallel Device Convenience without thermal runaway
- High Temperature Application
- Hard Switching & Higher Reliability
- Easy to drive

Applications

- motor drive
- Photovoltaic inverter
- UPS power supply
- High voltage DC / DC converter
- Switching Mode Power Supply





TO-247-4
Pin definition

Part Number	Package	Marking
LGE3M50120Q	TO-247-4	LGE3M50120Q

Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedures.

LGE3M50120Q

Silicon Carbide Power MOSFET

Maximum Ratings

T_C=25℃, unless otherwise specified

Parameter			Symbol	Value	Unit
Drain-source voltage	V_{GS} = 0V，	I_D =100 μ A	V_{DS}	1200	V
Gate-source voltage	Recommended maximum		V_{GS}	-5 to 20	V

Maximum Ratings

T_C=25℃, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current : V_{GS} = 20V T_C = 25° C T_C = 100° C	I_D	 58 43	A
Pulsed drain current： Pulse width limited by SOA	I_{DM}	145	A
Power dissipation ： T_C = 25° C	P_{TOT}	344	W
Storage temperature range :	T_{stg}	-55 to +175	°C
Operating and junction temperature:	T_j	-55 to +175	°C
Soldre temperature: Wave soldering only allowed at leads, 1.6 mm from case for 10 s	T_L	260	°C

Thermal Resistance

Parameter	Symbol	Typ.	Unit
Thermal resistance to shell	R_{thJC}	0.436	°C/W

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LGE3M50120Q

Silicon Carbide Power MOSFET

Electrical Characteristic

T_C =25℃, unless otherwise specified

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Zero gate voltage drain current	I_{DSS}		5	100	μA	V_{DS} = 1200V V_{GS} = 0V
Gate leakage current	I_{GSS}		1	±100	nA	V_{DS} = 0V V_{GS} = -5~20V
Gate threshold voltage	V_{TH}		3.2 2.2		V	V_{GS} = V_{DS} I_D = 6mA T_C =175° C
Drain-source on-state resistance	R_{ON}		50 80	65	mΩ	V_{GS} = 20V I_D = 20A T_J = 25℃ T_J = 175℃
Input capacitance	C_{iss}		2750		pF	V_{DS} = 800V V_{GS} = 0V f = 1MHz V_{AC} = 25mV
Output capacitance	C_{oss}		106			
Reverse transfer capacitance	C_{rss}		5.2			
The output capacitor stores energy	E_{oss}		43		μJ	
Total gate charge	Q_g		120		nC	V_{DS} = 800V I_D = 20A V_{GS} = -5 to 20V
Gate to source charge	Q_{gs}		25			
Gate to drain charge	Q_{gd}		48			
Gate input resistance	R_g		2.8		Ω	f =1MHz
Tuen-on switching energy	E_{ON}		455.4		μJ	V_{DS} = 800V, I_D = 30A, V_{GS} = -2 to 20V, $R_{G(ext)}$ =3.3 Ω, L = 450 μH
Turn-off switching energy	E_{OFF}		213.6		μJ	
Turn-on delay time	$t_{d(on)}$		8.9		ns	
Rise time	t_r		28.9			

Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedure.

Turn-off delay time	$t_{d(off)}$		25.6			
Fall time	t_f		17.2			

Reverse Diode Characteristics

T_C =25°C, unless otherwise specified

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Diode forward voltage	V_{SD}		4.9 4.4		V	I_{SD} = 20A V_{GS} = 0V T_J = 175° C
Reverse recovery time	t_{rr}		44.4		ns	V_{GS}= -2V/+20V, I_{SD} = 30A, V_R = 800V, di/dt = 1000A/us, $R_{G(ext)}$ =10 Ω L = 450 μ H
Reverse recovery charge	Q_{rr}		212.6		nC	
Reverse recovery peak current	I_{RRM}		10.8		A	

Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedure

Characteristics Curves

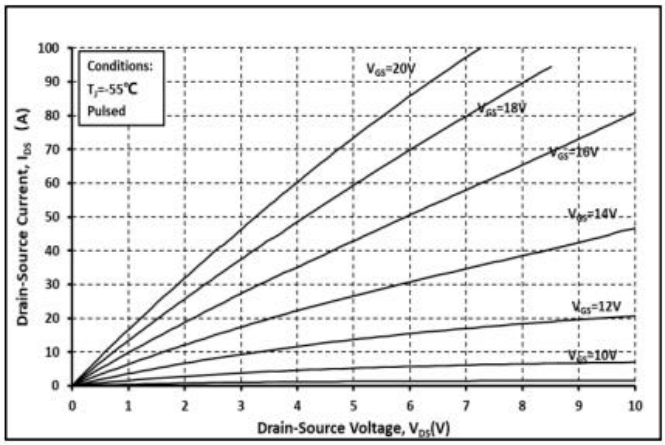


图. 1 输出曲线 @ T_J=-55°C

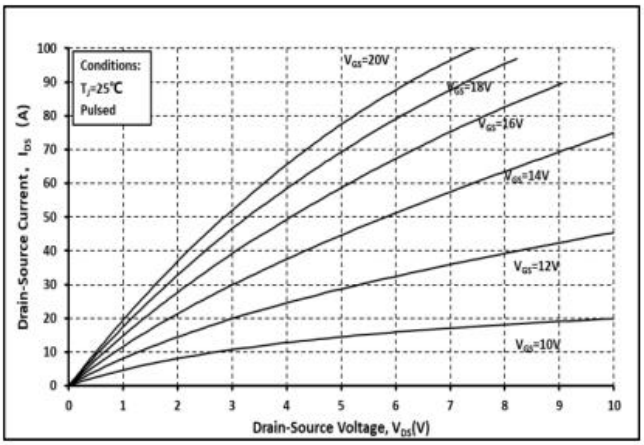


图. 2 输出曲线 @ T_J =25°C

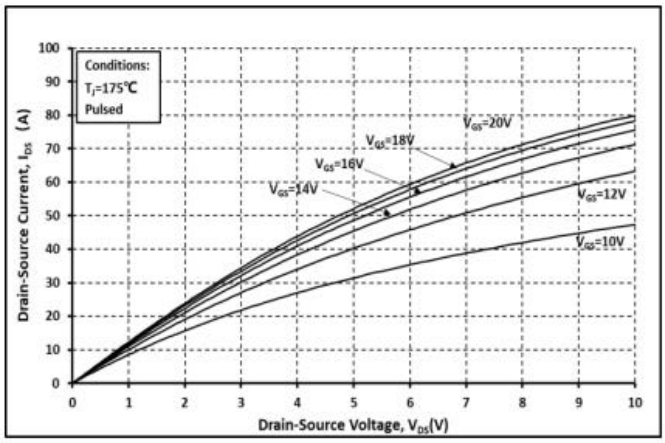


图. 3 输出曲线 @ T_J=175°C

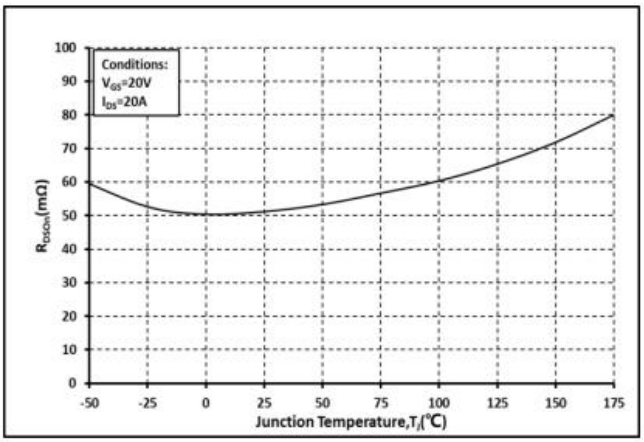


图. 4 Ron 和温度关系曲线

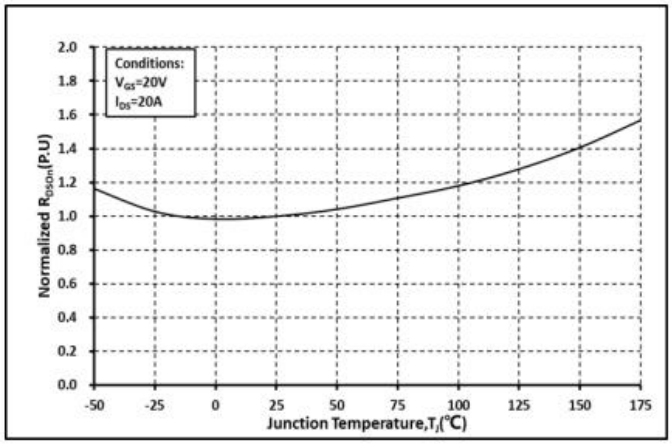


图. 5 归一化的 Ron 和温度关系曲线

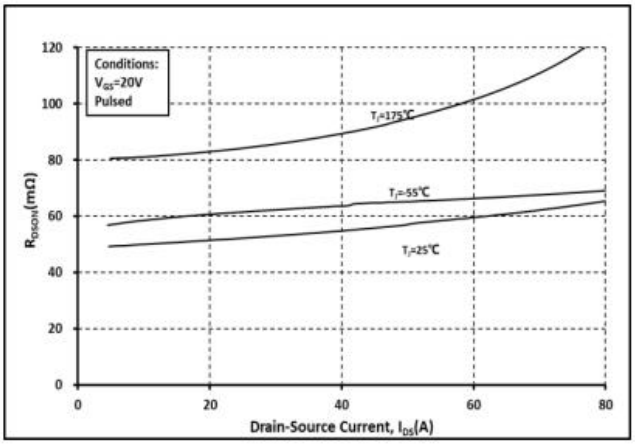


图 6 各温度下的 Ron 和 I_{DS} 关系曲线

Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedure

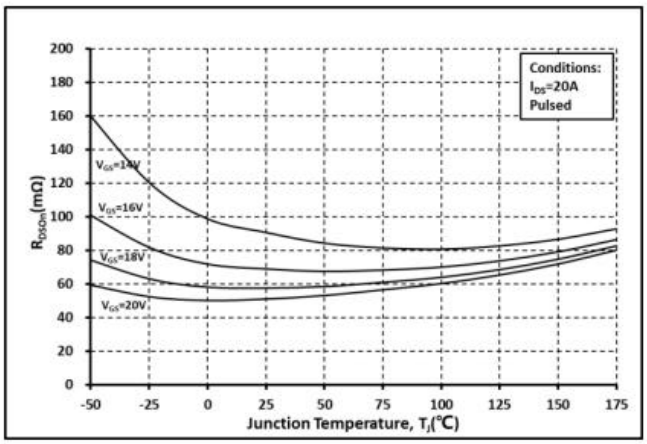


图. 7 各 V_{GS} 下的 Ron 和温度关系曲线

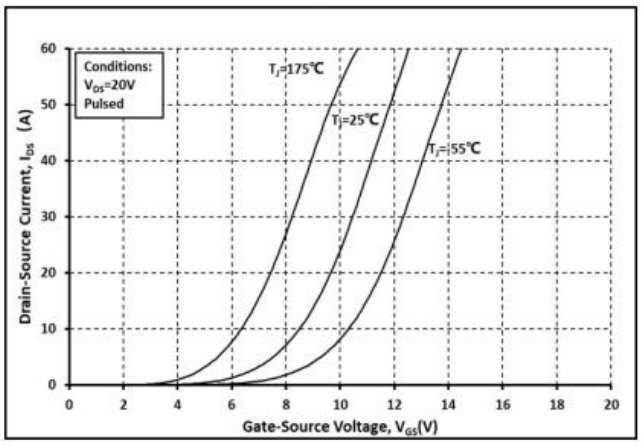


图. 8 各温度下的传输特性曲线

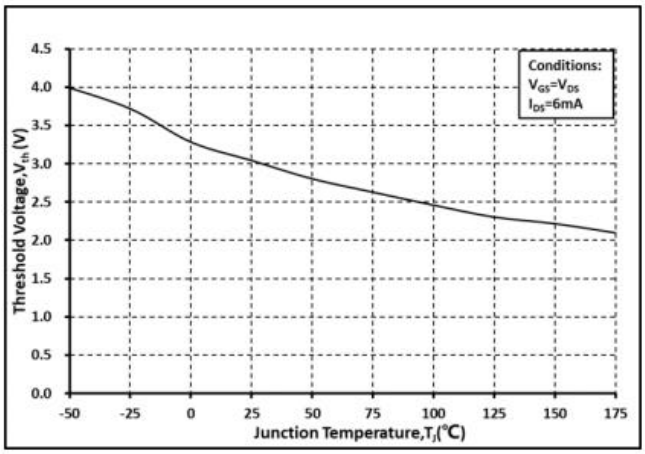


图. 9 阈值电压随温度变化曲线

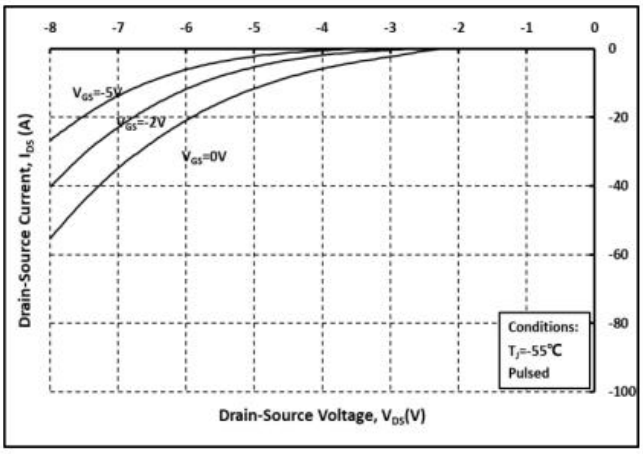


图. 10 体二极管导通曲线 @ T_J=-55°C

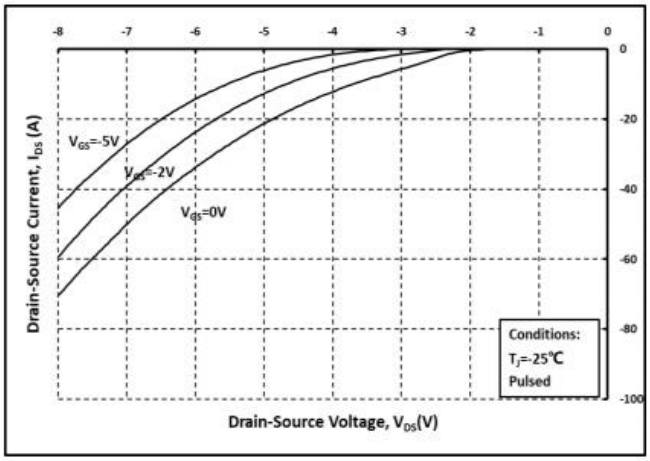


图. 11 体二极管导通曲线 @ T_J=25°C

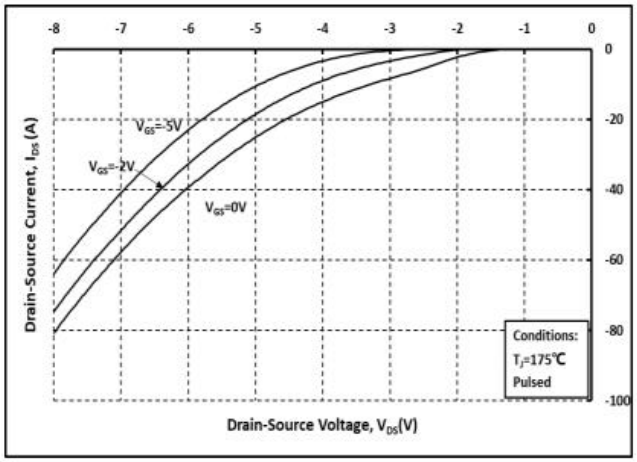


图. 12 体二极管导通曲线 @ T_J=175°C

Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedure

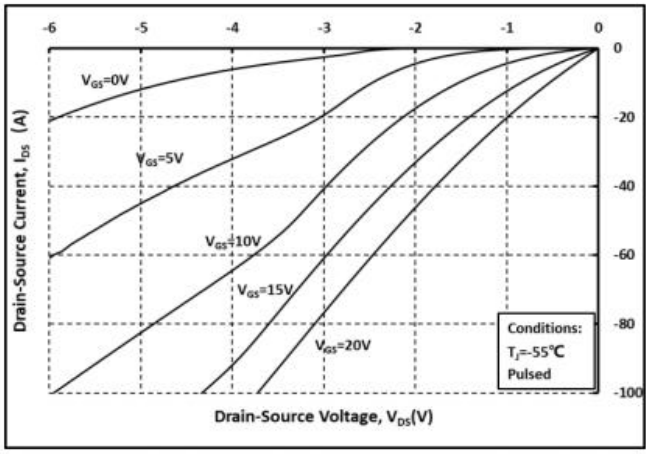


图. 13 第三象限曲线 @ T_J=-55°C

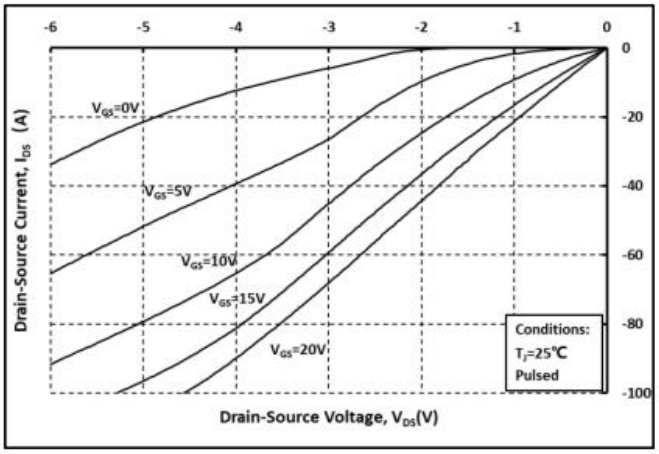


图. 14 第三象限曲线 @ T_J=25°C

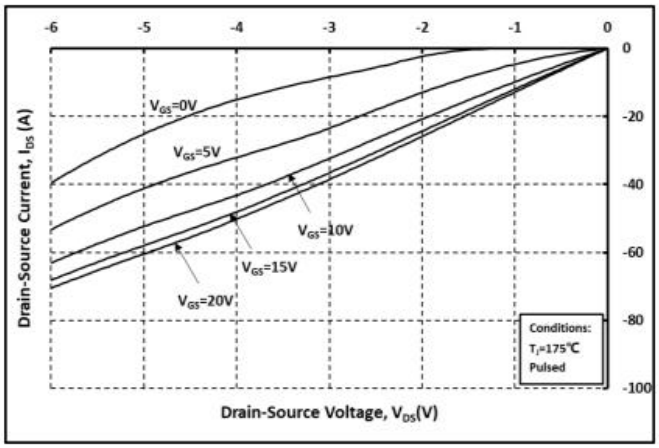


图. 15 第三象限曲线 @ T_J=175°C

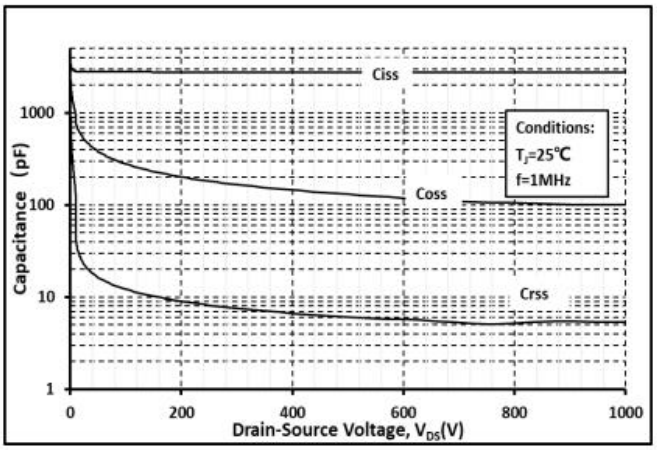


图. 16 各电容和 V_{DS} 关系曲线

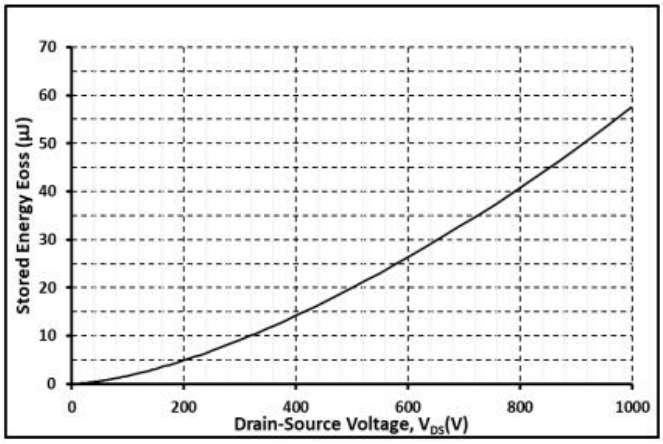


图. 17 输出电容存储能量曲线

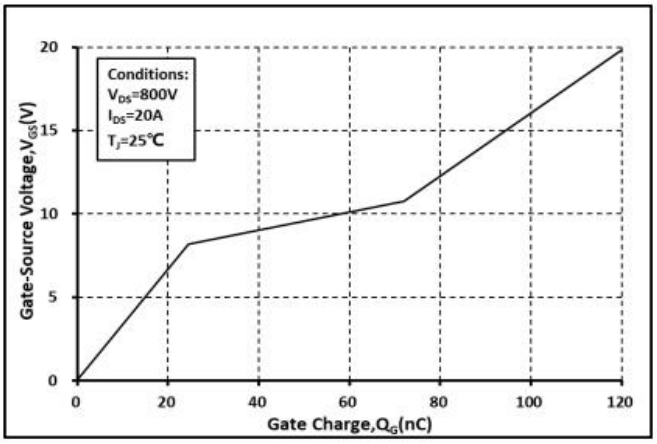


图. 18 栅电荷特征曲线

Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedure

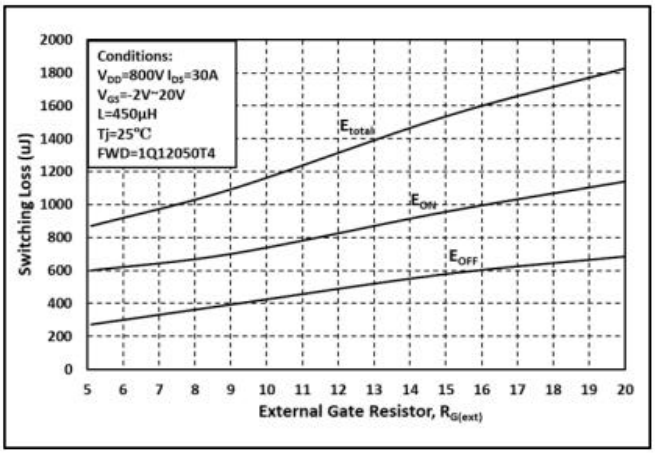


图. 19 开关能量和栅极电阻 $R_{G(ext)}$ 关系曲线

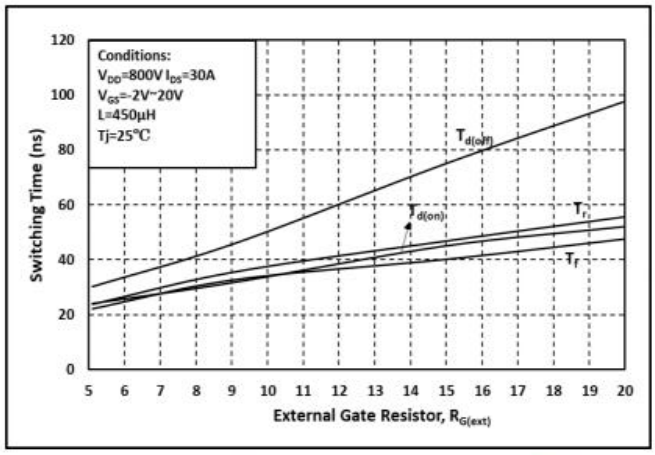


图. 20 开关时间和栅极电阻 $R_{G(ext)}$ 关系曲线

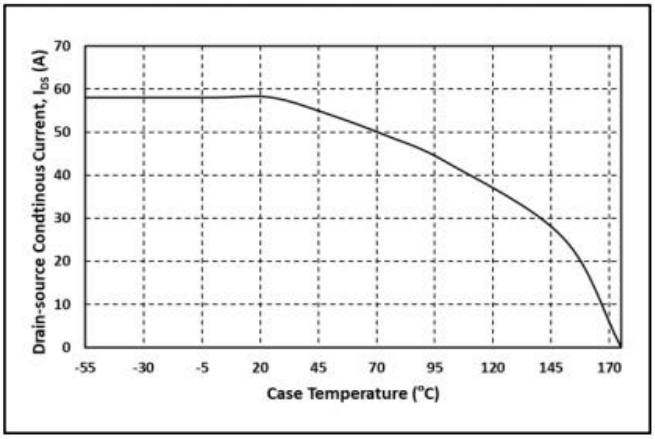


图. 21 漏端电流和温度关系曲线

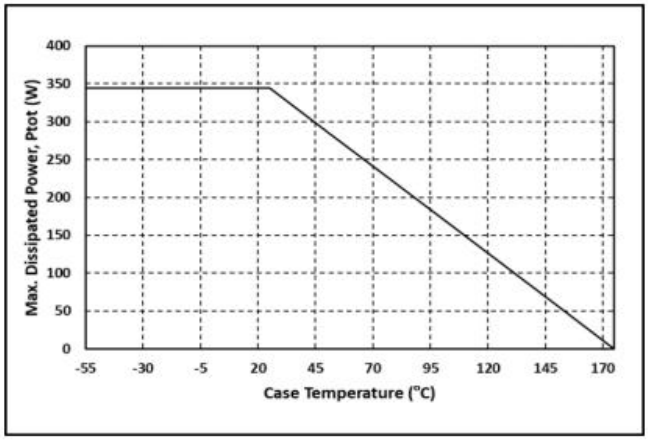


图. 22 最大功耗降额和温度关系曲线

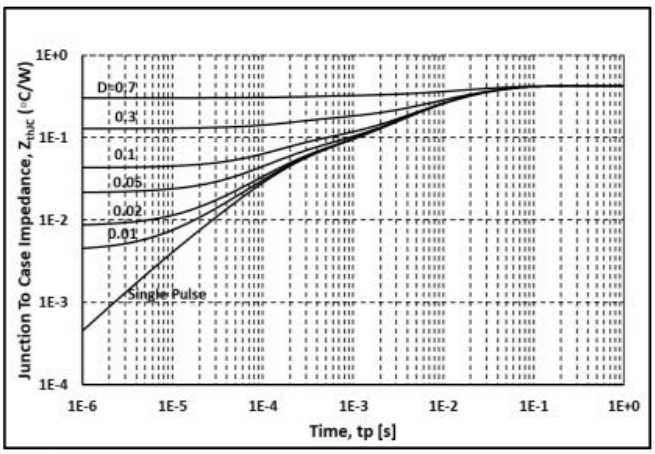


图. 23 热阻曲线

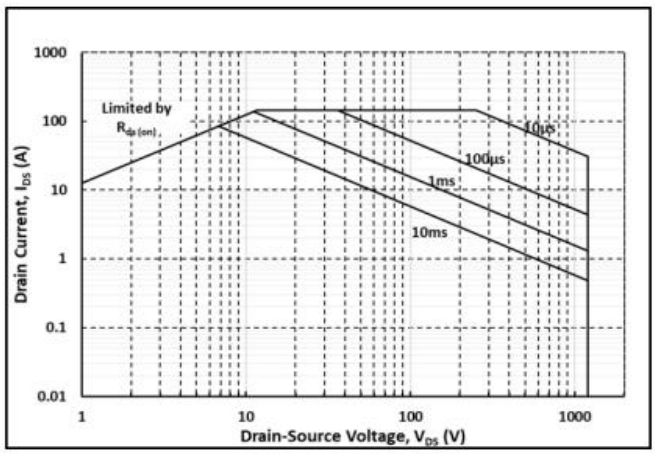


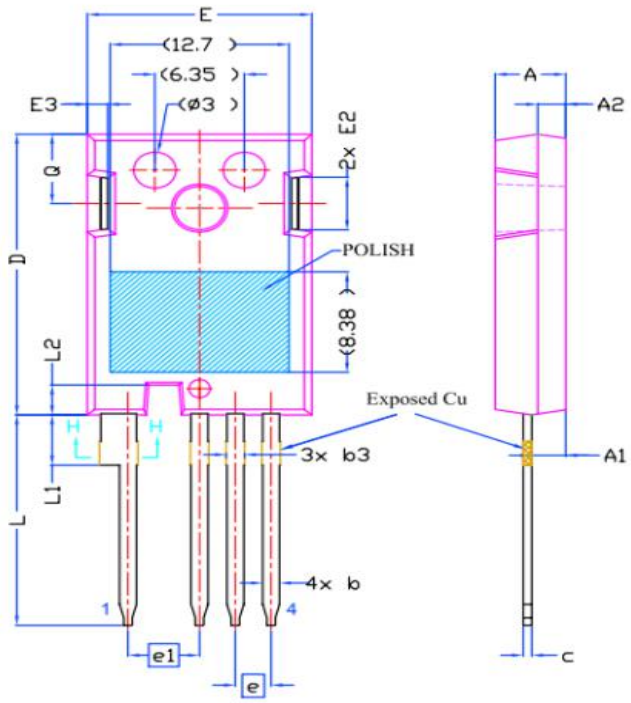
图. 24 安全工作区示意图

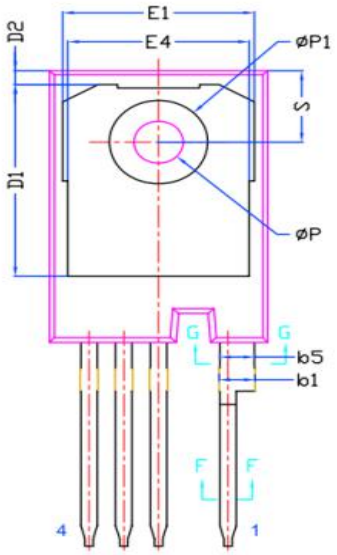
Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedure.

LGE3M50120Q

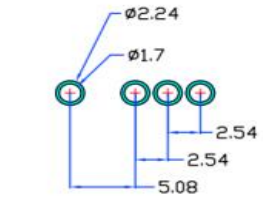
Silicon Carbide Power MOSFET

Package Outline:TO-247-4

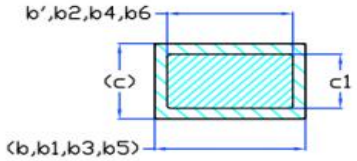




SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	4.83	5.02	5.21
A1	2.29	2.41	2.54
A2	1.91	2.00	2.16
b'	1.07	1.20	1.28
b	1.07	1.20	1.33
b1	2.39	2.67	2.94
b2	2.39	2.67	2.84
b3	1.07	1.30	1.60
b4	1.07	1.30	1.50
b5	2.39	2.53	2.69
b6	2.39	2.53	2.64
c	0.55	0.60	0.68
c1	0.55	0.60	0.65
D	23.30	23.45	23.60
D1	16.25	16.55	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	2.54 BSC		
e1	5.08 BSC		
L	17.31	17.57	17.82
L1	3.97	4.19	4.37
L2	2.35	2.50	2.65
ØP	3.51	3.61	3.65
ØP1	7.19 REF.		
Q	5.49	5.79	6.00
S	6.04	6.17	6.30



Recommended Solder Pad Layout



Section F--F, G--G, H--H

说明：

1. 封装标准参考：：JEDEC TO247, Variation AD
2. 以上单位为：毫米
3. 需要开槽，槽口可为圆形
4. 尺寸 D 和 E 不包括模具溢料

Packge	Packing	Box Size L×W×H(mm)	Quatity(pcs/box)	Carton Size L×W×H(mm)	Quatity(pcs/carton)
TO-247	30pcs/Tube	570×155×50	450	580×340×125	1800

Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedure.

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Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

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Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

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