LGE3M40065B

Silicon Carbide Power MOSFET

V_{DS} = 650 V
I_D@25°C = 72A
$R_{DS(ON)}$ = 40mΩ

Features

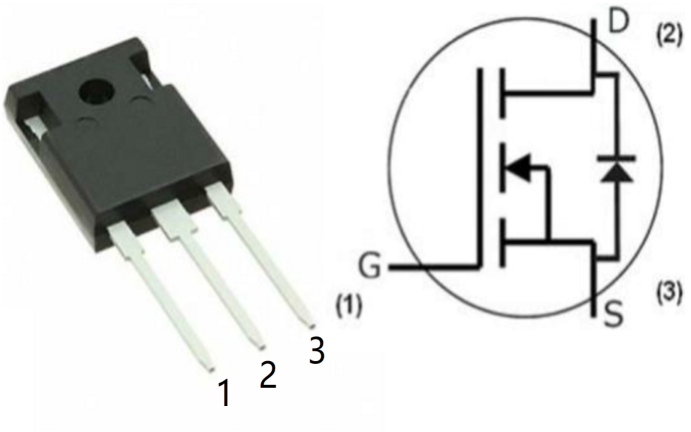
- High blocking voltage with low on-resistance
- High speed switching with low capacitance
- High operating junction temperature capability
- Very fast and robust intrinsic body diode

Benefits

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

Application

- Electric vehicle charging device
- Server and communication power
- Photovoltaic inverter
- UPS power supply
- High voltage DC / DC converter
- Switching Mode Power Suppl



TO-247-3
Pin definition

Part Number	Package	Marking
LGE3M40065B	TO-247-3	LGE3M40065B

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

Maximum Ratings

T_C=25°C, unless otherwise specified

Parameter			Symbol	Value	Unit
Drain-source voltage	V_{GS} = 0V,	I_D =100 μ A	V_{DS}	650	V
Gate-source voltage	Recommended maximum		V_{GS}	-5 to 20	V

Maximum Ratings

T_C=25°C, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current : V_{GS} = 20V T_C = 25° C T_C = 100° C	I_D	72 58	A
Pulsed drain current: Pulse width limited by SOA	I_{DM}	180	A
Power dissipation : T_C = 25° C	P_{TOT}	348	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}	0.431	°C/W

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Electrical Characteristic

T_C =25℃, unless otherwise specified

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Zero gate voltage drain current	I_{DSS}		3	100	μA	V_{DS} = 650V 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 = 6.1mA T_C =175° C
Drain-source on-state resistance	R_{ON}		40 53	55	mΩ	V_{GS} = 20V I_D = 20A T_J = 25℃ T_J = 175℃
Input capacitance	C_{iss}		2692		pF	V_{DS} = 600V V_{GS} = 0V f = 1MHz V_{AC} = 25mV
Output capacitance	C_{oss}		179			
Reverse transfer capacitance	C_{rss}		10.8			
The output capacitor stores energy	E_{oss}		35.6		μJ	
Total gate charge	Q_g		110.8		nC	V_{DS} = 400V I_D = 20A V_{GS} = -5 to 20V
Gate to source charge	Q_{gs}		26.8			
Gate to drain charge	Q_{gd}		35.7			
Gate input resistance	R_g		2		Ω	f =1MHZ
Tuen-on switching energy	E_{ON}		289.1		μJ	V_{DS} = 400V, I_D = 30A, V_{GS} = -2 to 20V, $R_{G(ext)}$ =3.3Ω, L = 450 μH
Turn-off switching energy	E_{OFF}		117.1		μJ	
Turn-on delay time	$t_{d(on)}$		24.7		ns	
Rise time	t_r		20.3			

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Turn-off delay time	$t_{d(off)}$		12.4			
Fall time	t_f		29.6			

Reverse Diode Characteristics

T_C =25°C, unless otherwise specified

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Diode forward voltage	V_{SD}		4.0 3.6		V	I_{SD} = 20A V_{GS} = 0V T_J = 175° C
Reverse recovery time	t_{rr}		23		ns	V_{GS}= -2V/+20V, I_{SD} = 30A, V_R = 400V, di/dt = 1700A/us, $R_{G(ext)}$ =3.3 Ω L = 450 μ H
Reverse recovery charge	Q_{rr}		161		nC	
Reverse recovery peak current	I_{RRM}		10.4		A	

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

Characteristics Curves

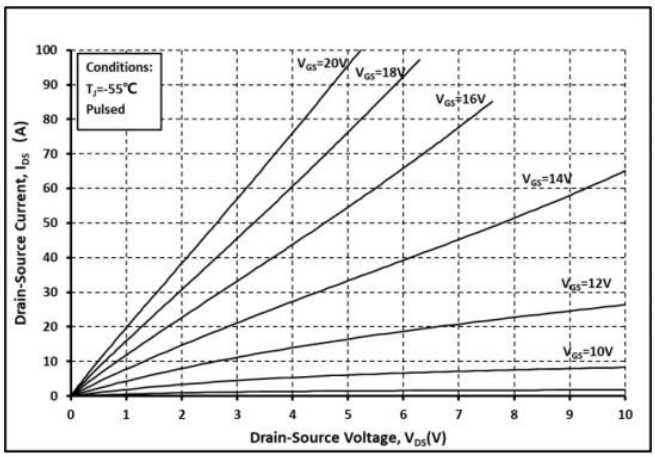


图. 1 输出曲线 @ T_J=-55°C

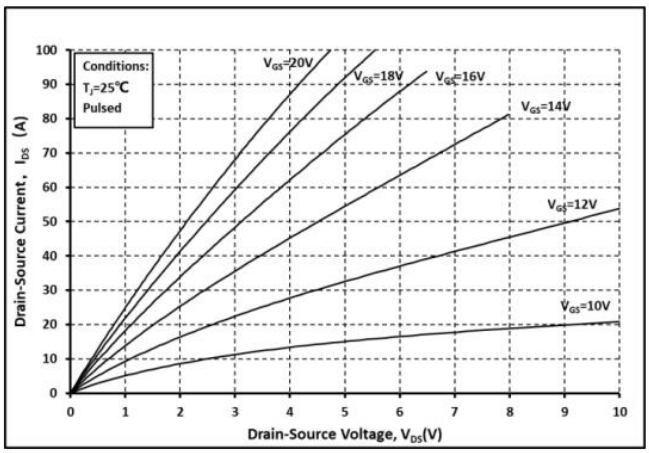


图. 2 输出曲线 @ T_J=25°C

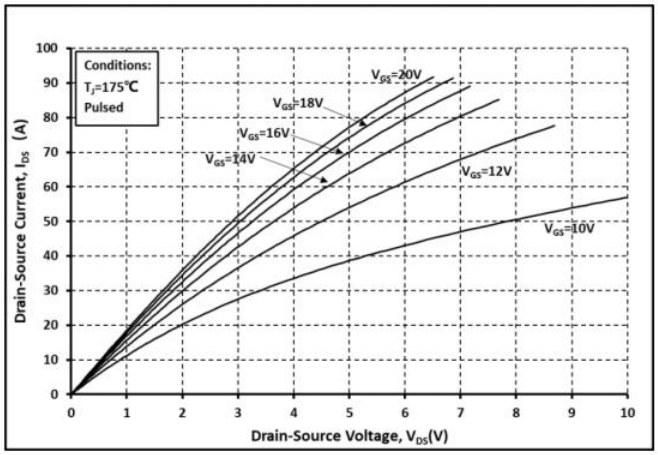


图. 3 输出曲线 @ T_J=175°C

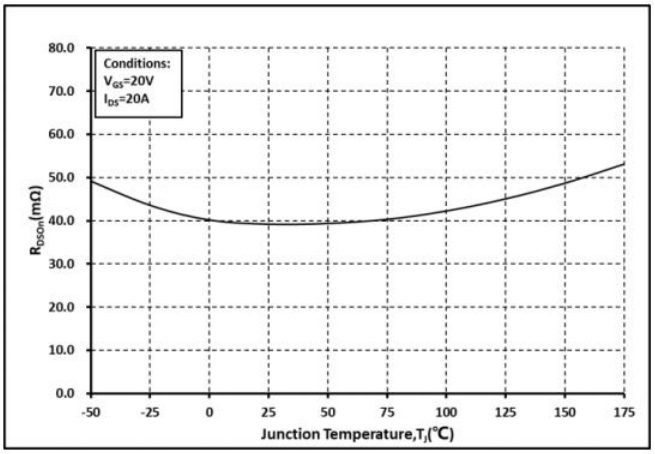


图. 4 Ron 和温度关系曲线

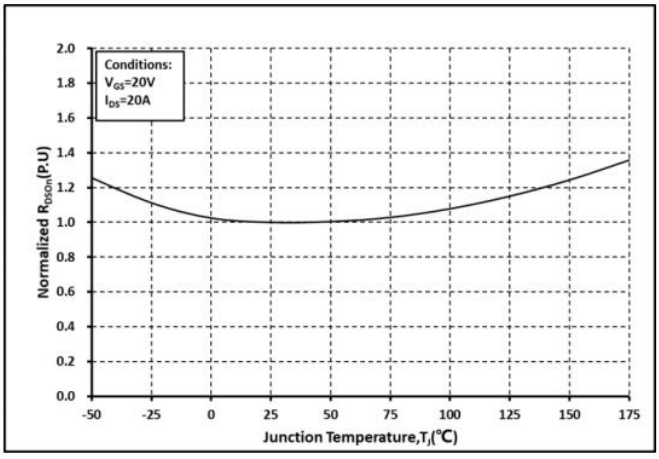


图. 5 归一化的 Ron 和温度关系曲线

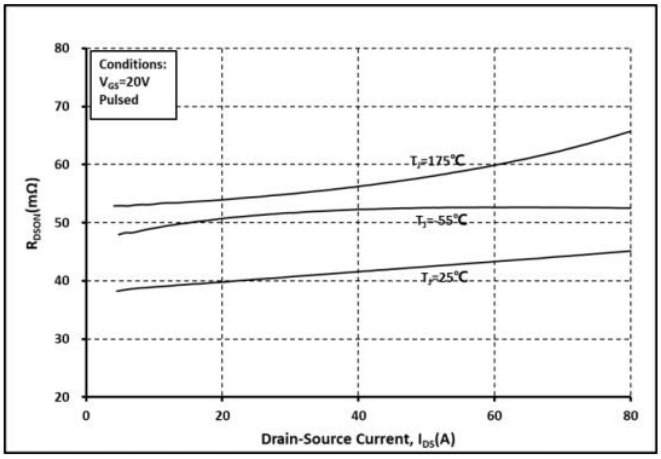


图 6 各温度下的 Ron 和 I_{DS} 关系曲线

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

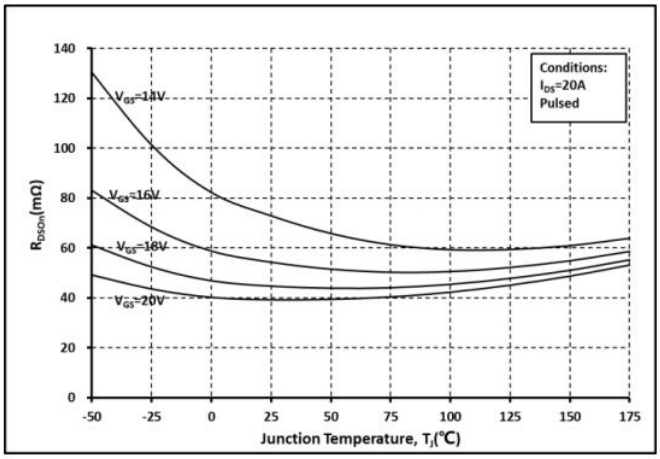


图. 7 各 V_{GS} 下的 Ron 和温度关系曲线

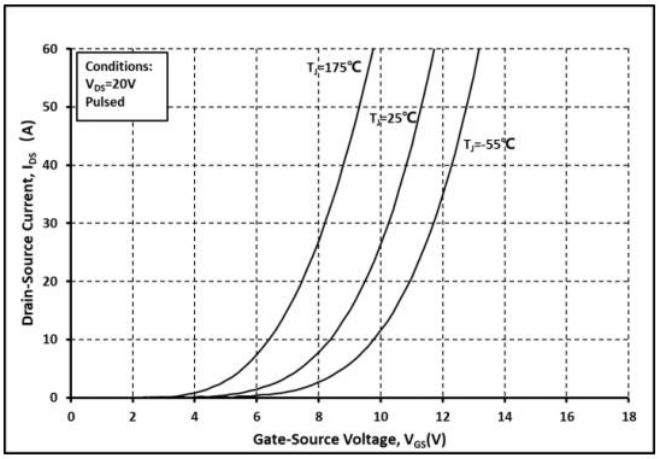


图. 8 各温度下的传输特性曲线

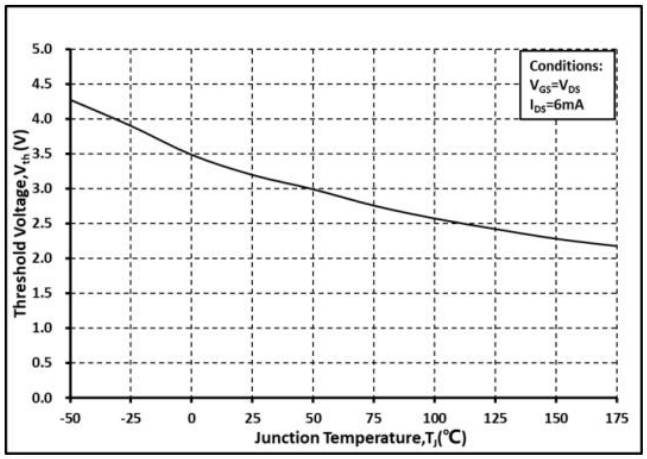


图. 9 阈值电压随温度变化曲线

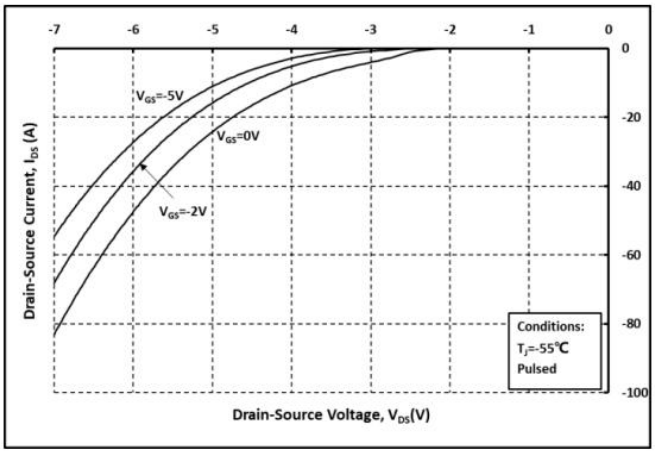


图. 10 体二极管导通曲线 @ T_J=-55℃

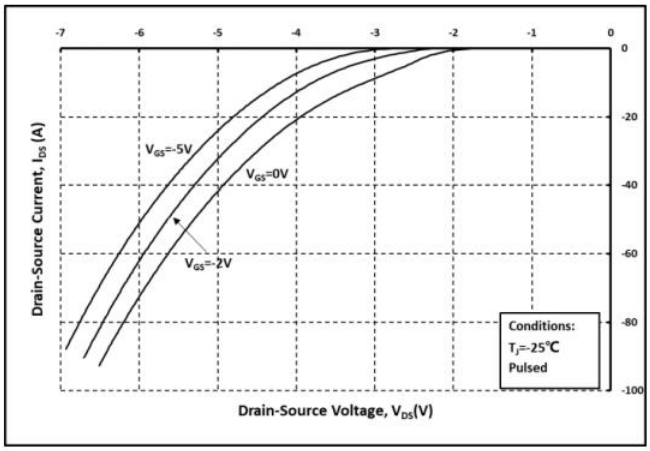


图. 11 体二极管导通曲线 @ T_J=25℃

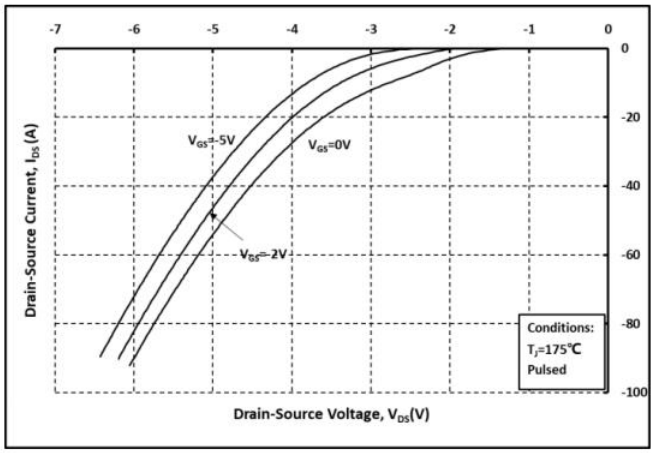


图. 12 体二极管导通曲线 @ T_J=175℃

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

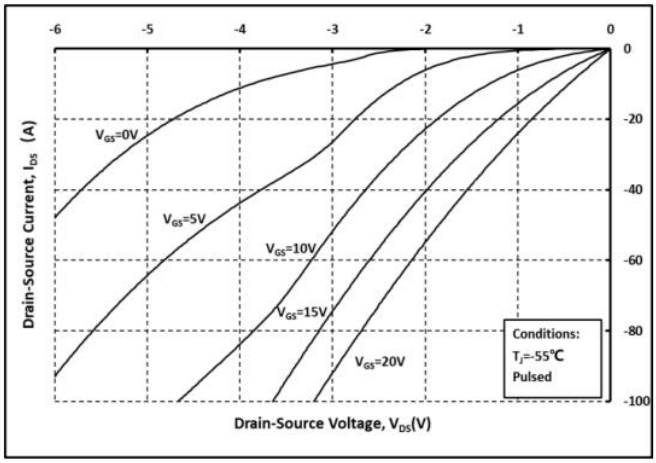


图. 13 第三象限曲线 @ T_J=-55°C

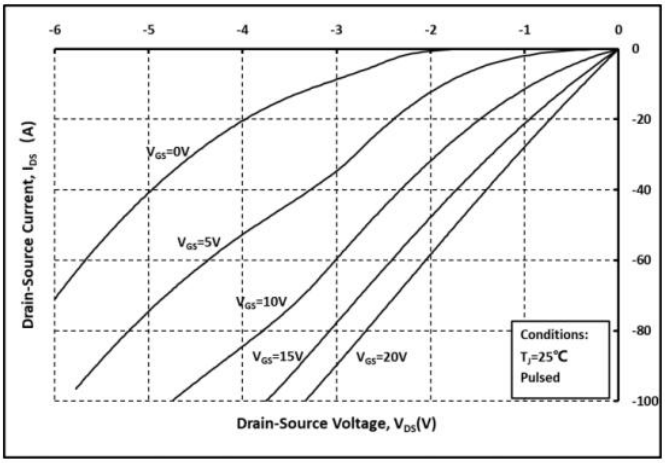


图. 14 第三象限曲线 @ T_J=25°C

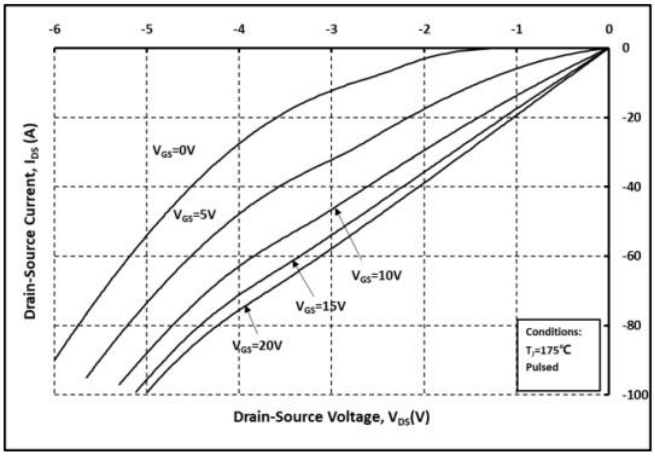


图. 15 第三象限曲线 @ T_J=175°C

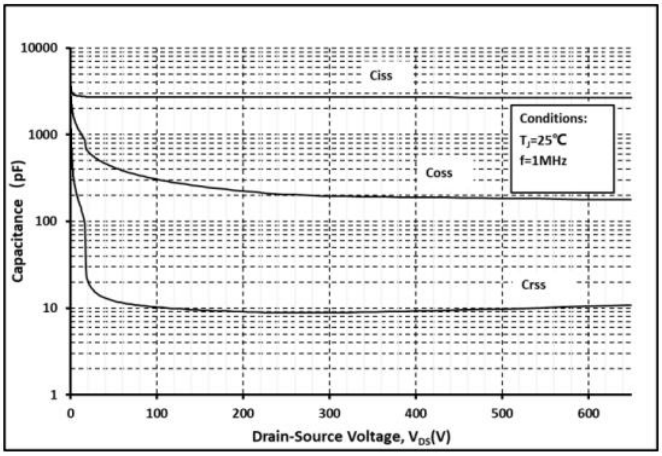


图. 16 各电容和 V_{DS} 关系曲线

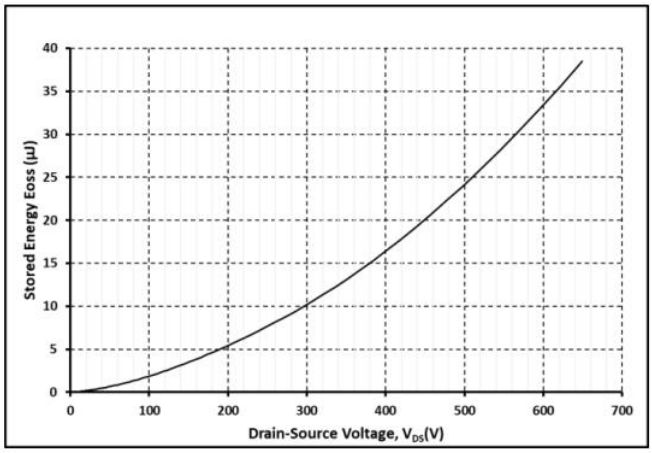


图. 17 输出电容存储能量曲线 c

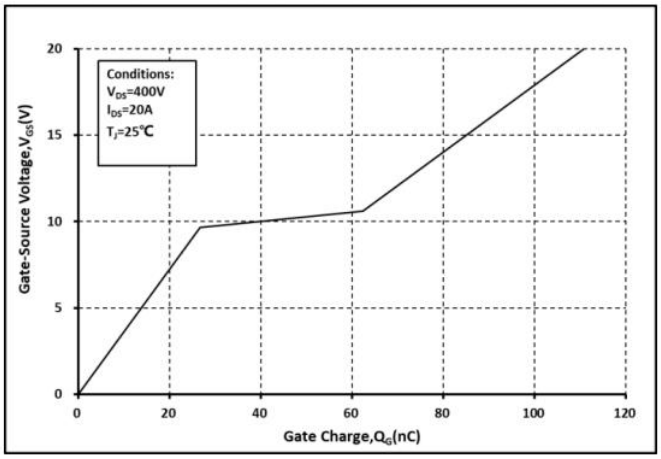


图. 18 栅电荷特征曲线 c

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

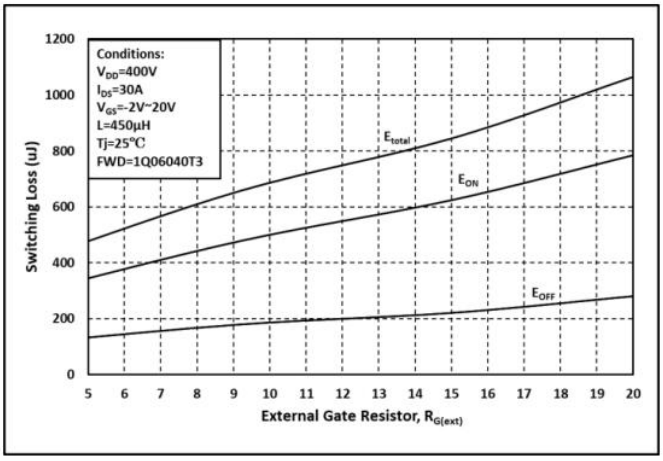


图. 19 开关能量和栅极电阻 $R_{G(ext)}$ 关系曲线

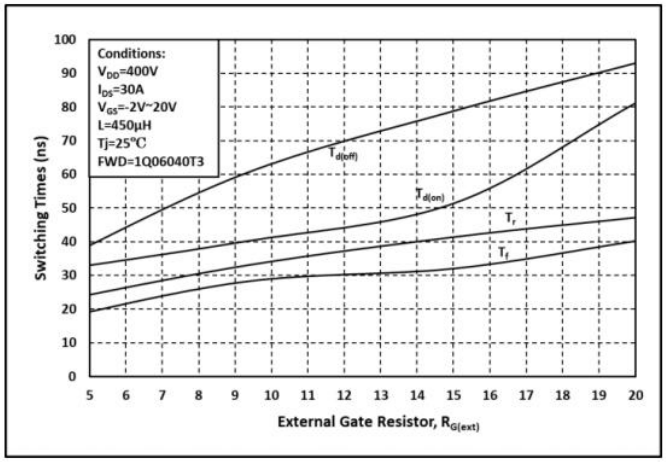


图. 20 开关时间和栅极电阻 $R_{G(ext)}$ 关系曲线

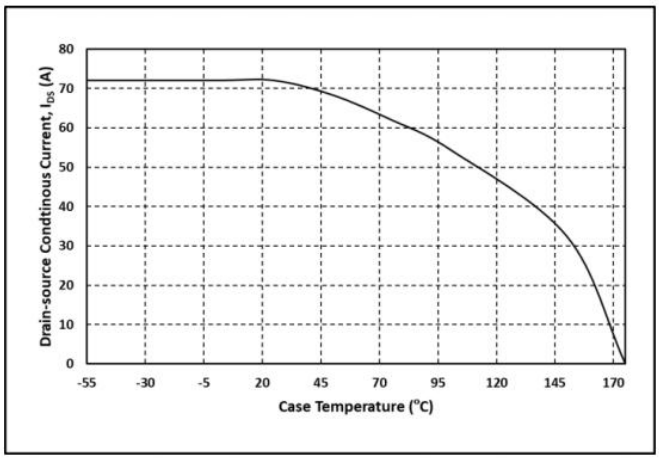


图. 21 漏端电流和温度关系曲线

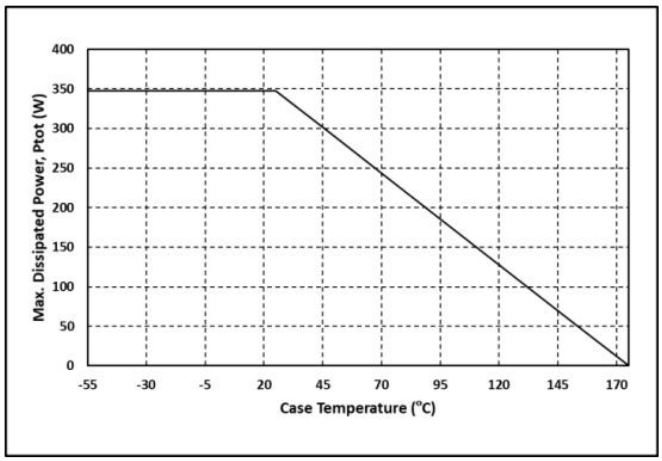


图. 22 最大功耗降额和温度关系曲线

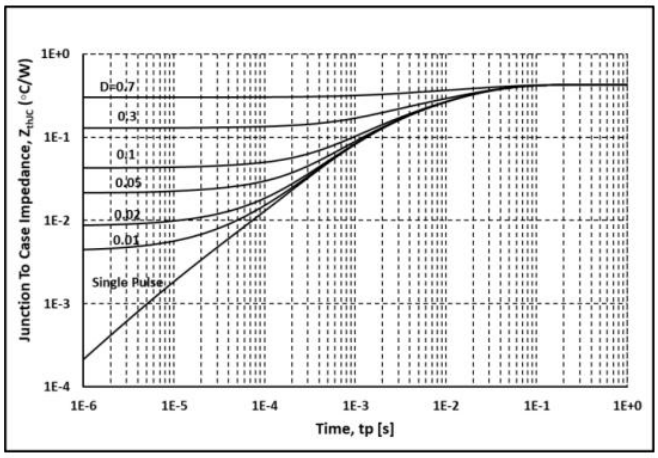


图. 23 热阻曲线

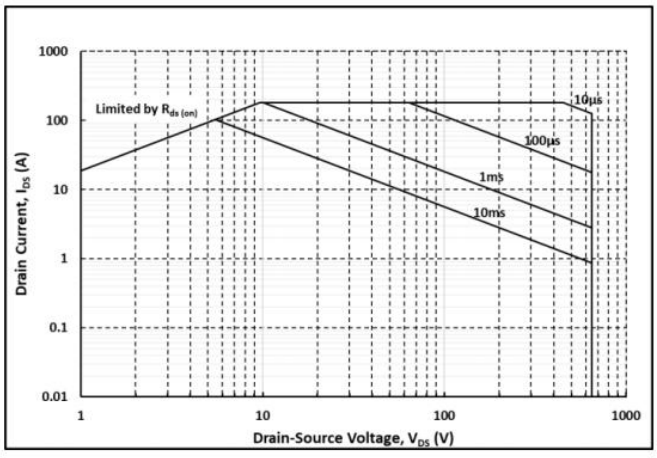


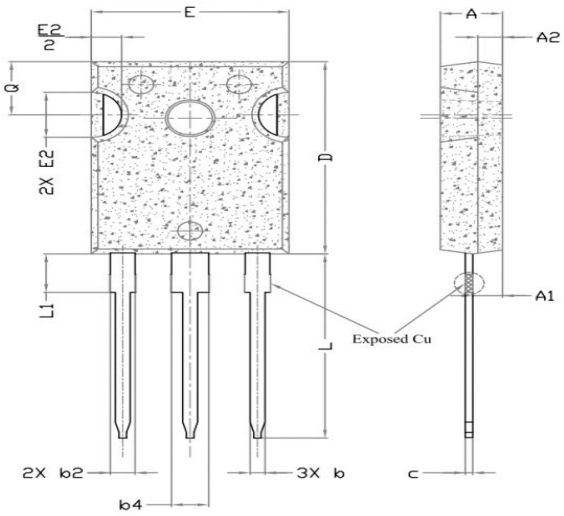
图. 24 安全工作区示意图

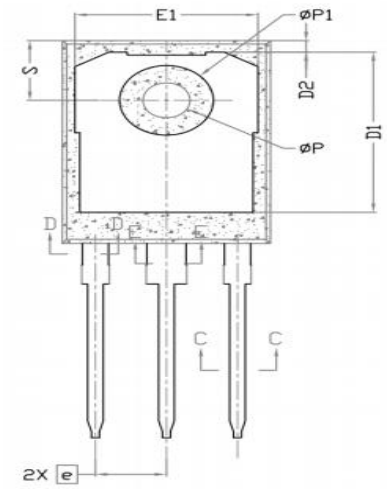
Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedures.

LGE3M40065B

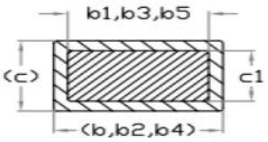
Silicon Carbide Power MOSFET

Package Outline:TO-247-3





SYMBOL	DIMENSIONS			NOTES
	MIN.	NOM.	MAX.	
A	4.83	5.02	5.21	
A1	2.29	2.41	2.55	
A2	1.50	2.00	2.49	
b	1.12	1.20	1.33	
b1	1.12	1.20	1.28	
b2	1.91	2.00	2.39	6
b3	1.91	2.00	2.34	
b4	2.87	3.00	3.22	6, 8
b5	2.87	3.00	3.18	
c	0.55	0.60	0.69	6
c1	0.55	0.60	0.65	
D	20.80	20.95	21.10	4
D1	16.25	16.55	17.65	5
D2	0.51	1.19	1.35	
E	15.75	15.94	16.13	4
E1	13.46	14.02	14.16	5
E2	4.32	4.91	5.49	3
e	5.44BSC			
L	19.81	20.07	20.32	
L1	4.10	4.19	4.40	6
øP	3.56	3.61	3.65	7
øP1	7.19REF.			
Q	5.39	5.79	6.20	
S	6.04	6.17	6.30	



Section C--C,D--D,E--E

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

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