REASUNOS

RSM065040W

N-Channel SiC Power MOSFET

V_{DS}	=	650 V
$R_{DS(on)}$	=	40 mΩ
I_D@25℃	=	72 A

Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitance
- Easy to Parallel and Simple to Drive

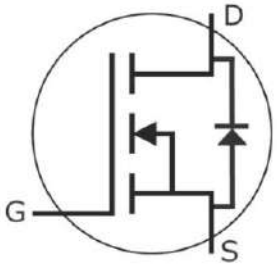
Benefits

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

Applications

- Power Supplies
- High Voltage DC/DC Converters
- Motor Drives

Package



Part Number	Package
RSM065040W	TO-247-3

Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain-Source Voltage	650	V	V_{GS}=0V, I_D=1mA	
V_{GSmax}	Gate-Source Voltage	-10/+25	V	Absolute maximum values	
V_{GSop}	Gate-Source Voltage	-5/+20	V	Recommended operational values	
I_D	Continuous Drain Current	72	A	V_{GS}=20V, T_c=25°C	
		58		V_{GS}=20V, T_c=100°C	
$I_{D(pulse)}$	Pulsed Drain Current	180	A	Pulse width t_p limited by T_{Jmax}	
P_D	Power Dissipation	348	W	T_c=25°C,	
T_J, T_{STG}	Operating Junction and Storage Temperature	-55 to +175	℃		

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	650			V	V_{GS}=0V, I_D=1mA	
$V_{GS(th)}$	Gate Threshold Voltage		3.2		V	V_{DS}=V_{GS}, I_D=6.1mA	
			2.2			V_{DS}=V_{GS}, I_D=6.1mA, T_J=175℃	
I_{DSS}	Zero Gate Voltage Drain Current		3	100	μA	V_{DS}=650V, V_{GS}=0V	
I_{GSS}	Gate-Source Leakage Current		1	100	nA	V_{DS}=0V, V_{GS}=-5-20V	
$R_{DS(on)}$	Drain-Source On-State Resistance		40	55	mΩ	V_{GS}=20V, I_D=20A,	
			53			V_{GS}=20V, I_D=20A, T_J=175℃	
C_{iss}	Input Capacitance		2692		pF	V_{GS}=0V	
C_{oss}	Output Capacitance		179			V_{DS}=600V	
C_{rss}	Reverse Transfer Capacitance		10.8			f=1MHz	
E_{oss}	C_{oss} Stored Energy		35.6		μJ	V_{AC}=25mV	
E_{ON}	Turn-On Switching Energy		289.1		μJ	V_{DS}=400V, V_{GS}=-5V/20V	
E_{OFF}	Turn-Off Switching Energy		117.1			I_D=20A, $R_{G(ext)}$=2.5Ω, L=200μH	
$t_{d(on)}$	Turn-On Delay Time		24.7		ns	V_{DS}=400V, V_{GS}=-2V/20V, I_D=30A $R_{G(ext)}$=3.3Ω, L=450μH	
t_r	Rise Time		20.3				
$t_{d(off)}$	Turn-Off Delay Time		12.4				
t_f	Fall Time		29.6				
$R_{G(int)}$	Internal Gate Resistance		2		Ω	f=1MHz,	
Q_{GS}	Gate to Source Charge		26.8		nC	V_{DS}=400V	
Q_{GD}	Gate to Drain Charge		35.7			V_{GS}=-5V/20V	
Q_G	Total Gate Charge		110.8			I_D=20A	

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	4.0		V	V_{GS}=0V, I_{SD}=20A	
		3.6			V_{GS}=0V, I_{SD}=20A T_J=175°C	
t_{rr}	Reverse Recover Time	23		ns	V_R=400V, I_{SD}=30A dif/dt=1700A/μs	
Q_{rr}	Reverse Recovery Charge	161		nC		
I_{rrm}	Peak Reverse Recovery Current	10.4		A		

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.431		℃/W		

Typical Performance

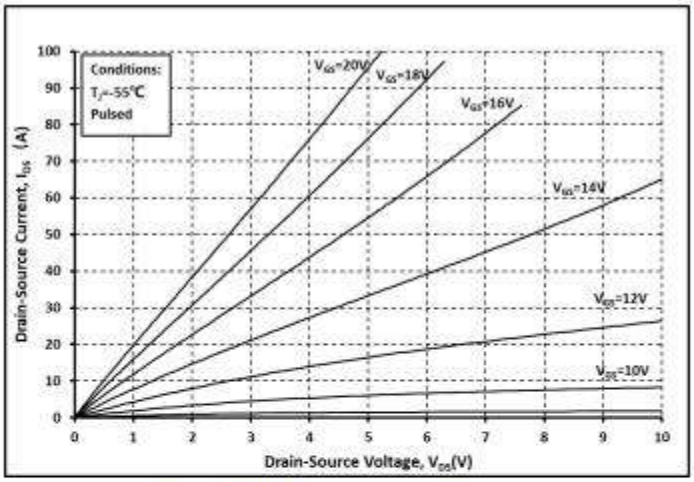


图. 1 输出曲线 @ T_j=-55°C

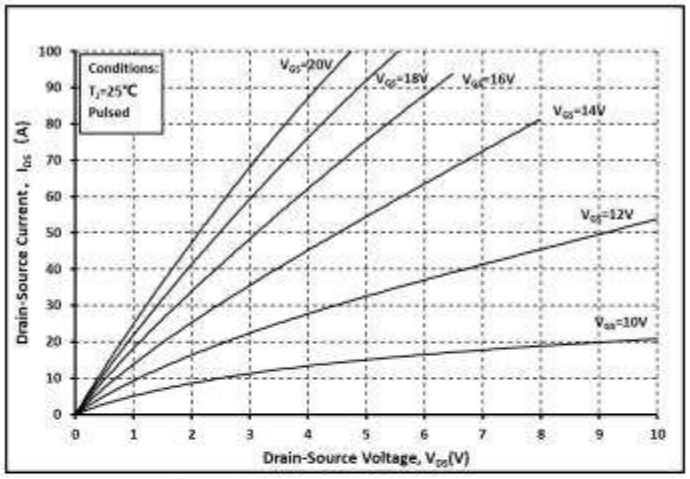


图. 2 输出曲线 @ T_j=25°C

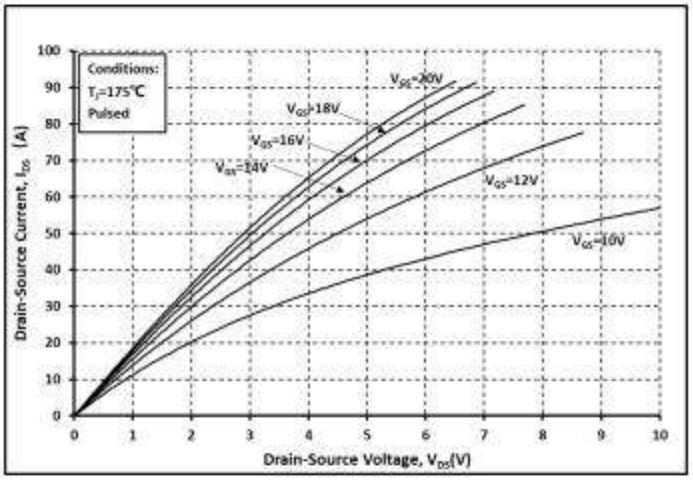


图. 3 输出曲线 @ T_j=175°C

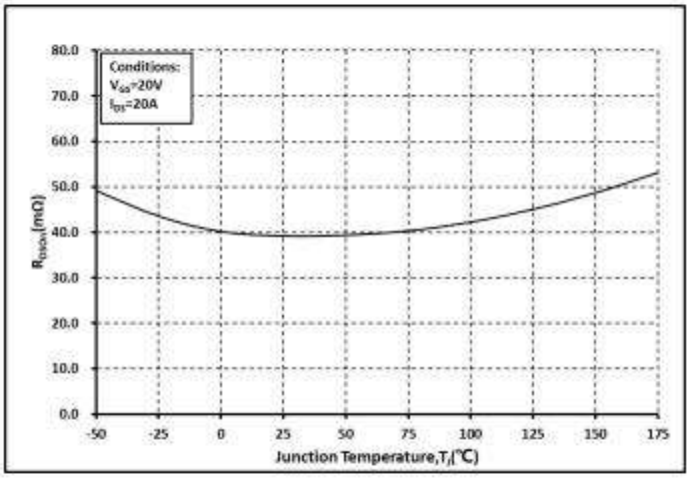


图. 4 Ron 和温度关系曲线

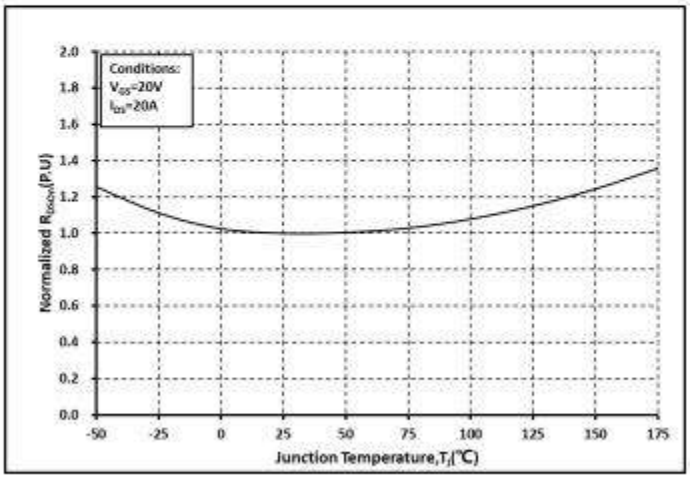


图. 5 归一化的 Ron 和温度关系曲线

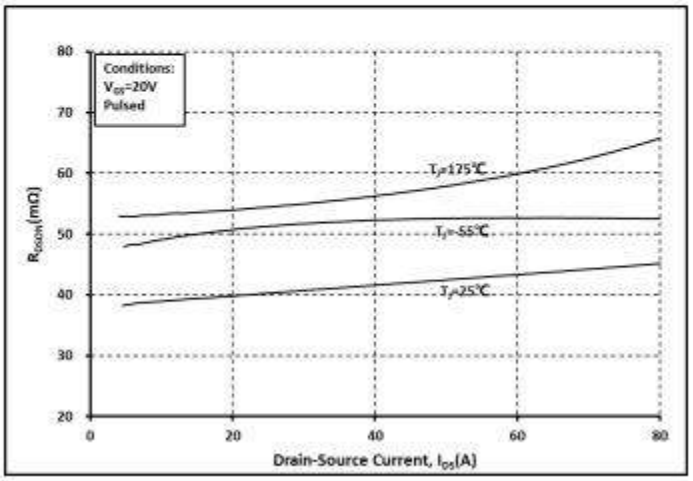


图 6 各温度下的 Ron 和 I_{DS} 关系曲线

Typical Performance

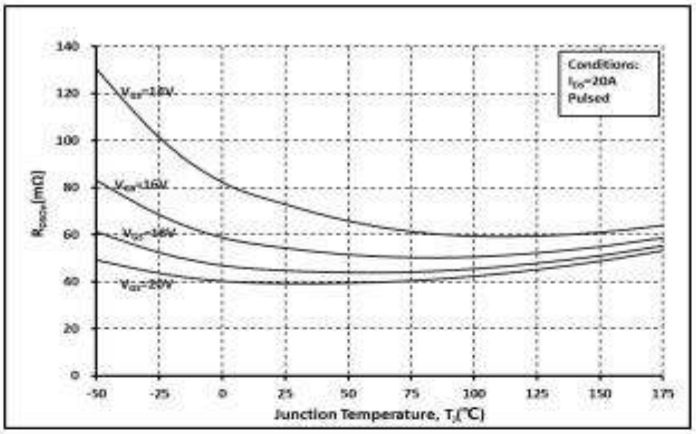


图. 7 各 V_{GS} 下的 Ron 和温度关系曲线

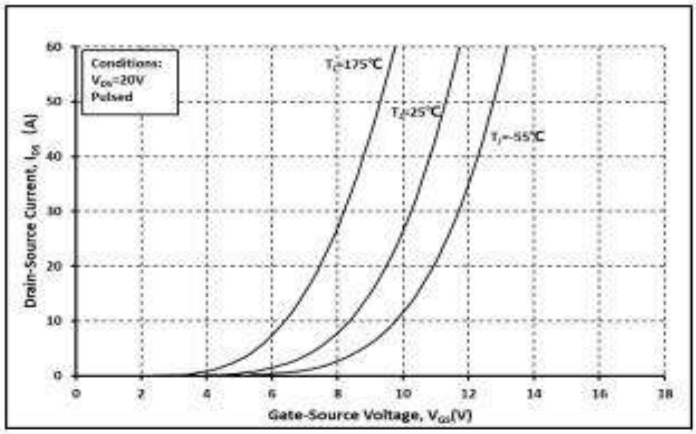


图. 8 各温度下的传输特性曲线

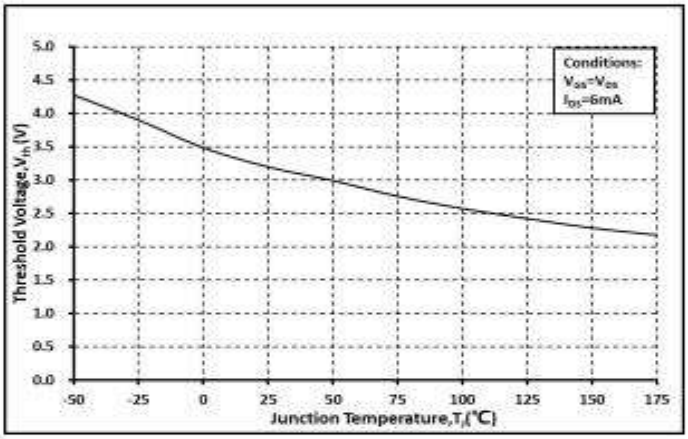


图. 9 阈值电压随温度变化曲线

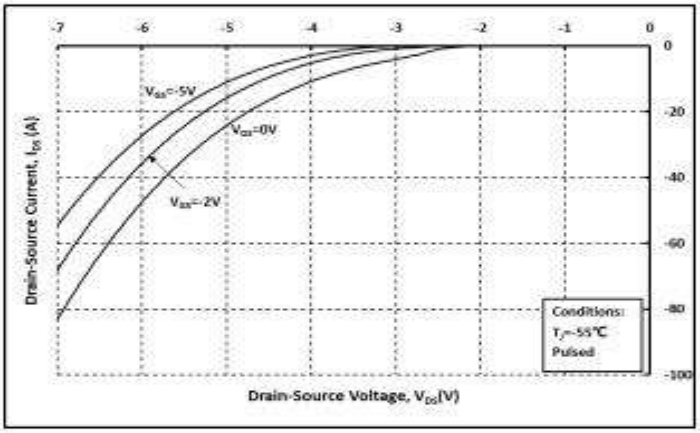


图. 10 体二极管导通曲线 @ T_J=-55℃

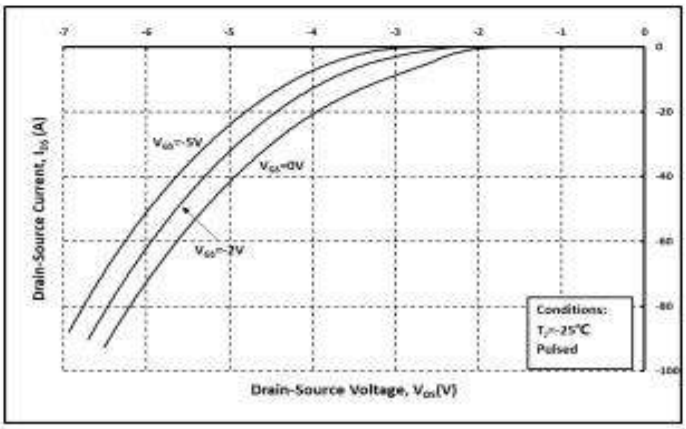


图. 11 体二极管导通曲线 @ T_J=25℃

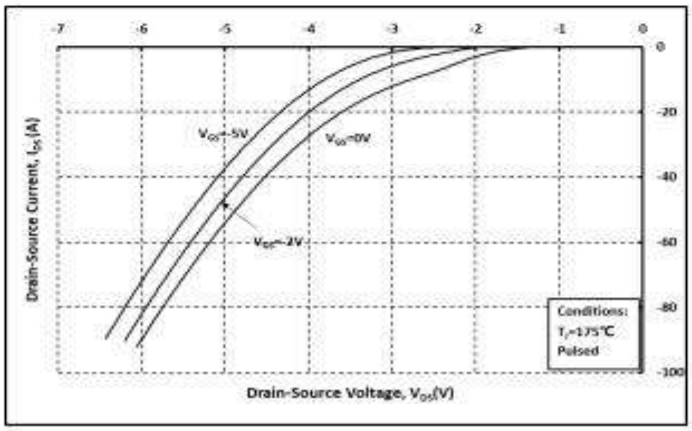


图. 12 体二极管导通曲线 @ T_J=175℃

Typical Performance

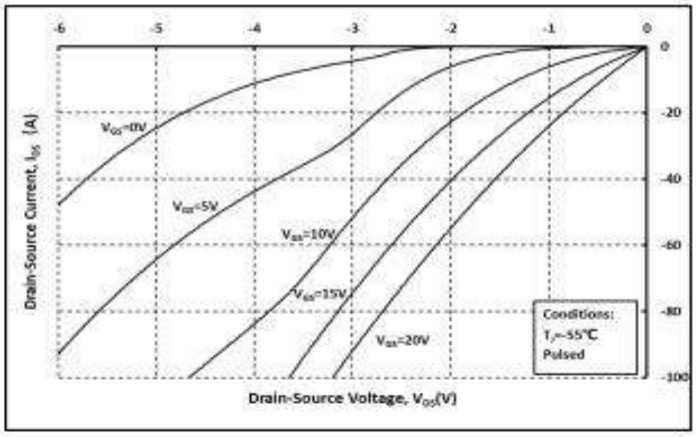


图. 13 第三象限曲线 @ T_J=-55°C

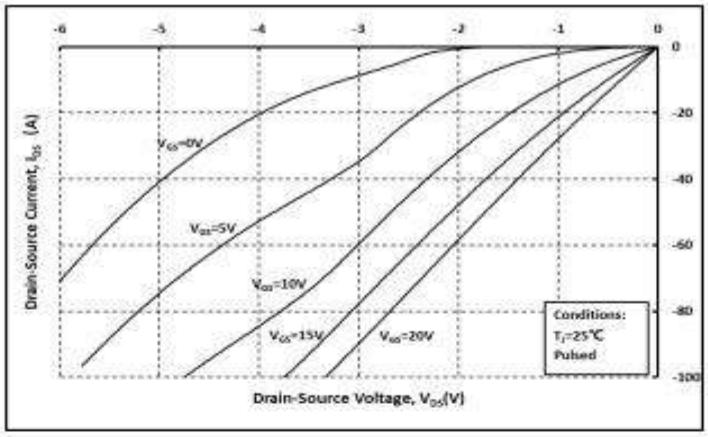


图. 14 第三象限曲线 @ T_J=25°C

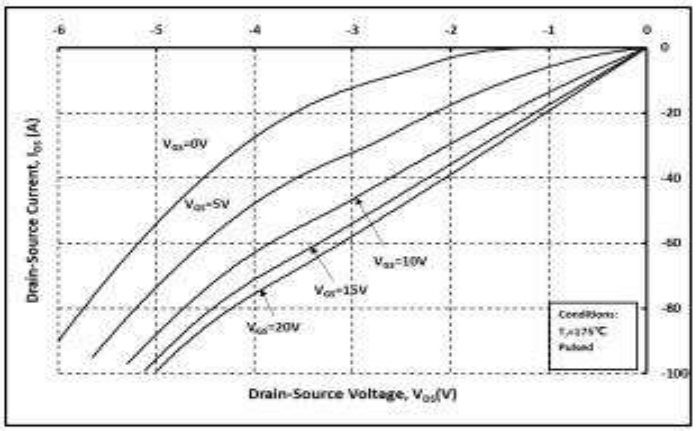


图. 15 第三象限曲线 @ T_J=175°C

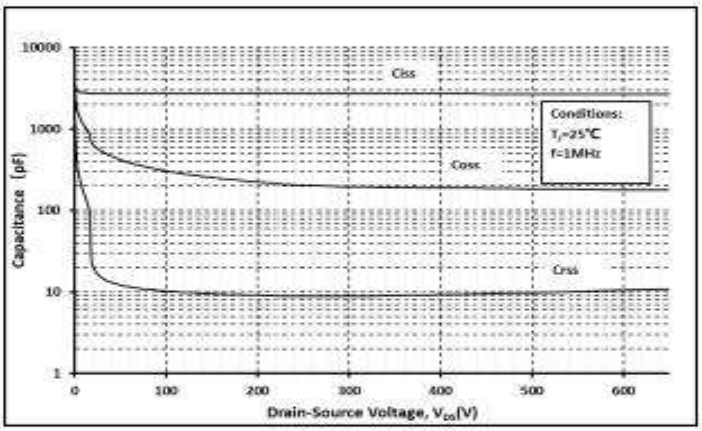


图. 16 各电容和 V_{DS} 关系曲线

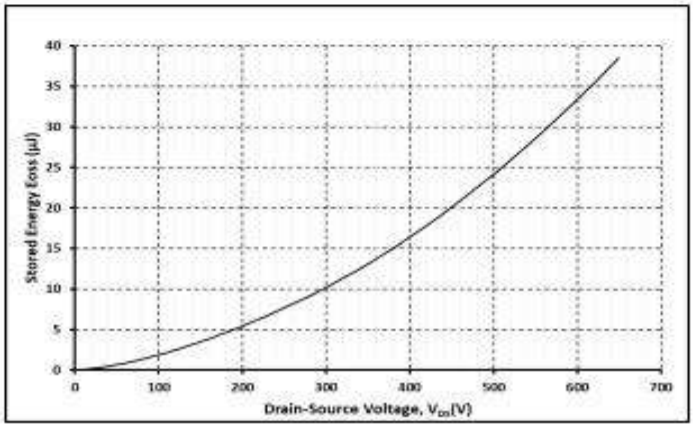


图. 17 输出电容存储能量曲线 c

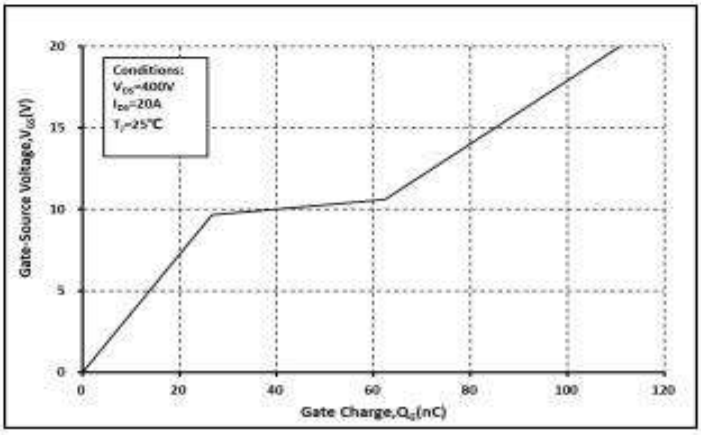


图. 18 栅电荷特征曲线 c

Typical Performance

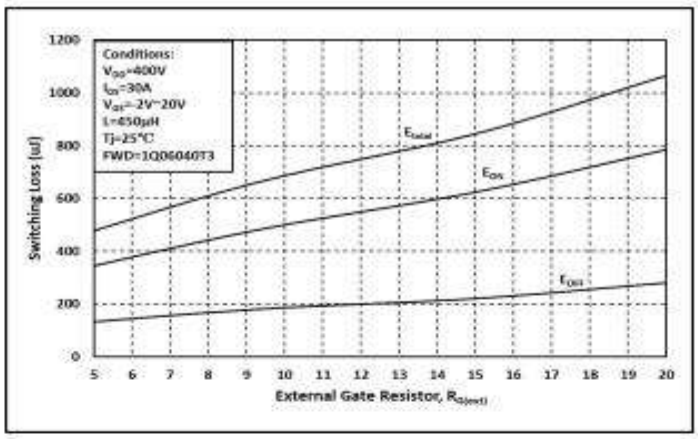


图. 19 开关能量和栅极电阻 $R_{G(ext)}$ 关系曲线

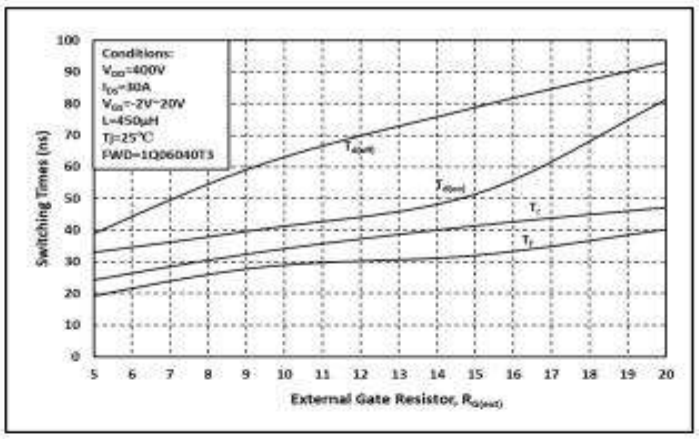


图. 20 开关时间和栅极电阻 $R_{G(ext)}$ 关系曲线

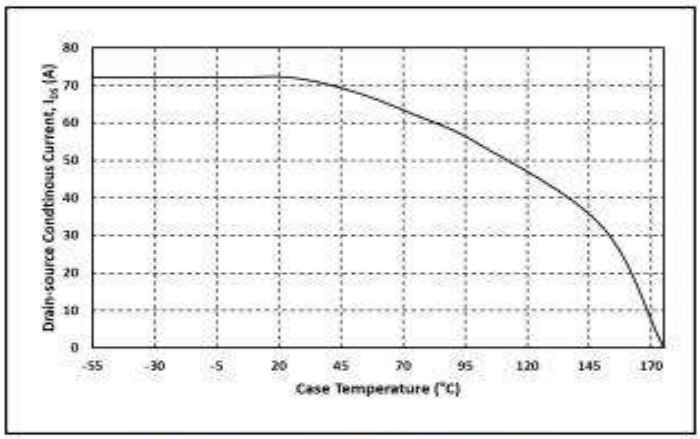


图. 21 漏端电流和温度关系曲线

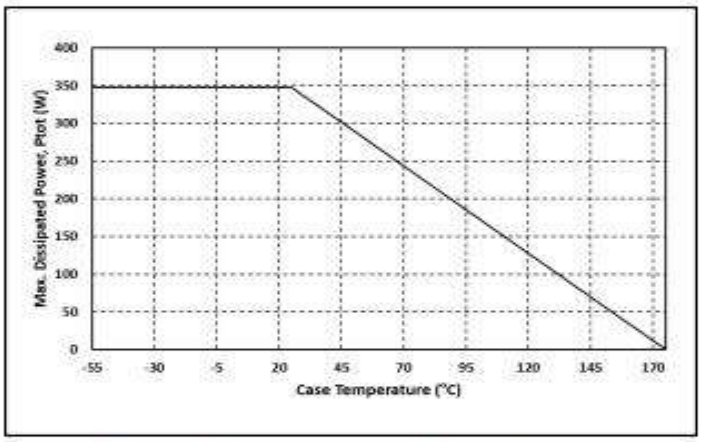


图. 22 最大功耗降额和温度关系曲线

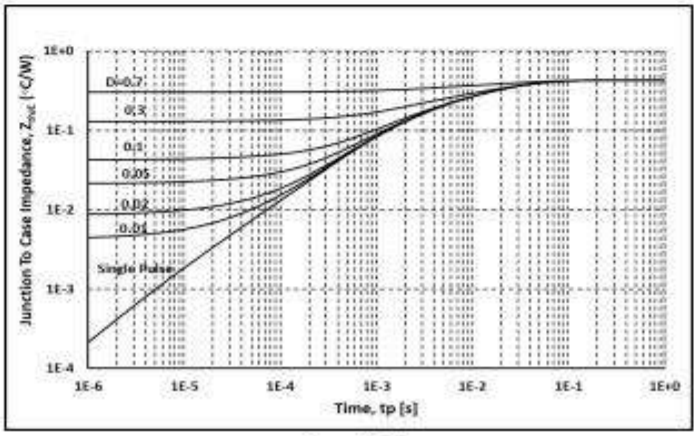


图. 23 热阻曲线

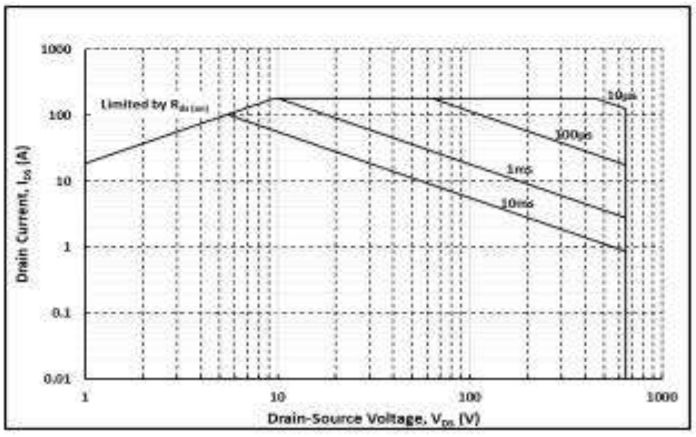
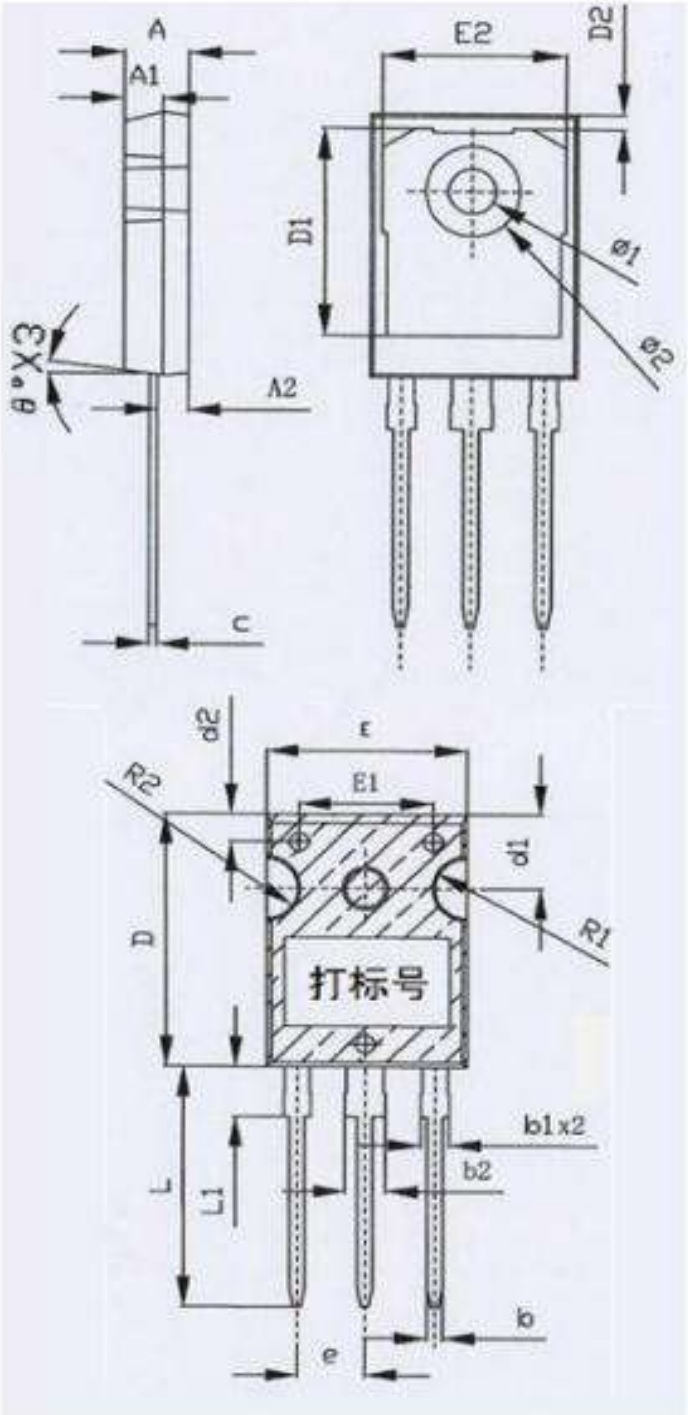


图. 24 安全工作区示意图

Package Dimensions

Package TO-247-3



SYMBOLS	DIMENSIONS IN MILLMETERS		
	MIN	NOM	MAX
A	4.9	5	5.1
A1	2.9	3	3.1
A2	2.31	2.36	2.41
b	1.16	1.2	1.26
b1	2.05	-	2.2
b2	3.05	-	3.2
c	0.58	0.6	0.66
D	20.9	21	21.1
D1	16.46	16.56	16.76
D2		1.17	
d1	6.05	6.15	6.25
d2	2.2	2.3	2.4
E	15.7	15.8	15.9
E1		10.5	
E2		14.02	
e	-	1.27bcs	-
L	19.82	19.92	20.02
L1	1.88	1.98	2.08
θ	0°	7°	8°
R1	-	2.7	-
R2	-	2.5	-
Φ1		3.6	
Φ2	-	7.19	-

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   b.support or sustain life,
   c.whose failuer to when properly used in accordance with instructions for used provided in the laeling,can be reasonably expected to result in significant injury to the user.

2. A critical component is any component of a life support device or system whose failure to system whose failure to perform can be reasonably expected to cause the failure of the life support device or system,or to affect its safety or effectiveness.