

关键参数
Key Parameters

V_{DSmax}		1200	V
$R_{DS(on)}$	Typ.	25	mΩ
I_D	Max.	82	A
Die Size		4.00×4.00	mm ²

特点
Features

- 高开关频率 High Switching Frequency
- 低开关损耗 Low Switching Loss
- 软、快速开关 Soft, fast Switching
- 易并联使用 Easy Paralleling

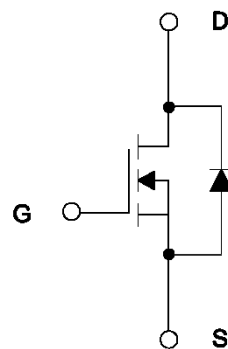
电路结构
Circuit Configuration


图 1. 电路结构

Fig. 1 Circuit configuration

最大额定值
Maximum Ratings

符号 Symbol	参数名称 Parameter	测试条件 Test Conditions	数值 Value	单位 Unit
V_{DSmax}	漏源极电压 Drain-source voltage		1200	V
V_{GSS}	栅源电压 Gate-source voltage		-8/+23	V
V_{GSop}	栅源电压 Gate-source voltage		-4/+18	V
I_D	持续正向电流, 由 $T_{vj\ max}$ 限制 Continuous forward current, limited by $T_{vj\ max}$		82	A
I_{DM}	最大重复正向电流, 由 $T_{vj\ max}$ 限制 Maximum repetitive forward current, limited by $T_{vj\ max}$		164	A
$T_{vj\ max}$	最大允许结温 Max. Junction temperature		175	°C
$T_{vj(op)}$	工作结温 Operation junction temperature		-40...+175	°C
$T_{Proc}^{(*)}$	最大加工温度 Maximum processing temperature		400	°C

电特性值
Electrical Characteristics

除非特别声明, 否则 $T_{vj} = 25\text{ }^{\circ}\text{C}$
 $T_{vj} = 25\text{ }^{\circ}\text{C}$ unless otherwise stated

符号 Symbol	参数名称 Parameter	测试条件 Test Conditions	最小值 Min.	典型值 Typ.	最大值 Max.	单位 Unit
I_{DSS}	零栅压漏极电流 Zero gate voltage drain current	$V_{GS} = 0V, V_{DS} = V_{DSS}$			20	μA
		$V_{GS} = 0V, V_{DS} = V_{DSS}, T_{vj} = 175\text{ }^{\circ}\text{C}$			20	μA
I_{GSS}	栅极漏电流 Gate leakage current	$V_{GS} = V_{GSS}, V_{DS} = 0V$			250	nA
$V_{GS(th)}^{(*2)}$	栅极-源极阈值电压 Gate threshold voltage	$I_D = 10\text{ mA}, V_{GS} = V_{DS}$	2.1	2.7		V
		$I_D = 10\text{ mA}, V_{GS} = V_{DS}, T_{vj} = 175\text{ }^{\circ}\text{C}$	1.4	2.0		V
$R_{DS(on)}$	漏极-源极通态电阻 Drain-source on-state resistance	$V_{GS} = 18V, I_D = 65A$		25	38	m Ω
		$V_{GS} = 18V, I_D = 65A, T_{vj} = 175\text{ }^{\circ}\text{C}$		45		m Ω
g_{fs}	跨导 Forward transconductance	$V_{DS} = 20V, I_D = 65A$		25.3		S
C_{iss}	输入电容 Input capacitance	$V_{DS} = 1000V, V_{GS} = 0V,$ $f = 100\text{ kHz}, V_{AC} = 30\text{ mV}$		2625		pF
C_{oss}	输出电容 Output capacitance			173		pF
C_{rss}	反向传输电容 Reverse transfer capacitance			13		pF
E_{oss}	电容存储能量 C_{oss} Stored Energy			84		μJ
R_{Gint}	内部栅极电阻 Internal gate resistor	$V_{GS} = 0V$		4		Ω
Q_{gs}	栅源电荷 Gate to source charge	$V_{DS} = 800V, V_{GS} = -4/18V, I_D = 65A$		22.9		nC
Q_{gd}	栅漏电荷 Gate to drain charge			89		nC
Q_g	总栅极电荷 Total gate charge			118		nC
V_{SD}	二极管正向电压 Diode forward voltage	$I_{SD} = 65A, V_{GS} = -4V$		5.4		V
		$I_{SD} = 65A, V_{GS} = -4V, T_{vj} = 175\text{ }^{\circ}\text{C}$		5.0		V

注意: 1.(*)1 表示最长持续时间 10min((*)1) indicates 10min, maximum);

Note: 3.(*)2 表示做过预处理后的测试值((*)2 indicates $V_{GS(th)}$ is preprocessed);

电特性值
Electrical Characteristics

符号 Symbol	参数名称 Parameter	测试条件 Test Conditions		最小值 Min.	典型值 Typ.	最大值 Max.	单位 Unit
$t_{d(off)}$	关断延迟时间 Turn-off delay time	I_D =65A, V_{DS} = 800V, V_{GS} = -4/+18V, $R_{G(OFF)}$ =6.8Ω, dv/dt =31800V/μs (T_{vj} = 175 °C)	T_{vj} = 25 °C		41		ns
			T_{vj} = 175 °C		40		
t_f	下降时间 Fall time		T_{vj} = 25 °C		23		ns
			T_{vj} = 175 °C		25		
E_{OFF}	关断损耗 Turn-off energy loss		T_{vj} = 25 °C		630		uJ
			T_{vj} = 175 °C		660		
$t_{d(on)}$	开通延迟时间 Turn-on delay time	I_D =65A, V_{DS} = 800V, V_{GS} = -4/+18V, $R_{G(ON)}$ =5.1Ω, di/dt =3750A/μs (T_{vj} = 175 °C)	T_{vj} = 25 °C		5		ns
			T_{vj} = 175 °C		4		
t_r	上升时间 Rise time		T_{vj} = 25 °C		14		ns
			T_{vj} = 175 °C		14		
E_{ON}	开通损耗 Turn-on energy loss		T_{vj} = 25 °C		1180		uJ
			T_{vj} = 175 °C		880		
Q_{rr}	二极管反向恢复电荷 Diode reverse recovery charge	I_D =65A, V_{DS} = 800V, - dI_{SD}/dt = 3760A/μs (T_{vj} = 175 °C)	T_{vj} = 25 °C		188		nC
			T_{vj} = 175 °C		678		
I_{rr}	二极管反向恢复电流 Diode reverse recovery current		T_{vj} = 25 °C		23		A
			T_{vj} = 175 °C		55		

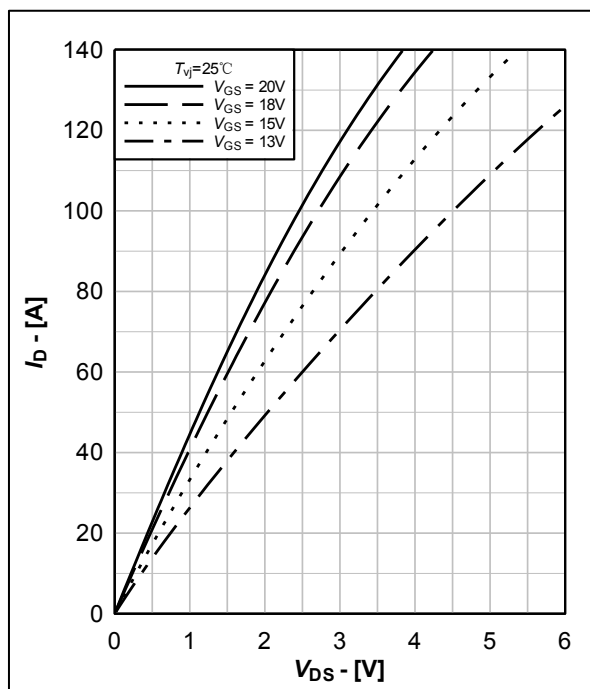


图2. 输出特性典型曲线, $I_D = f(V_{DS})$, $T_{vj} = 25\text{ }^{\circ}\text{C}$
Fig.2 Typical output characteristics, $I_D = f(V_{DS})$, $T_{vj} = 25\text{ }^{\circ}\text{C}$

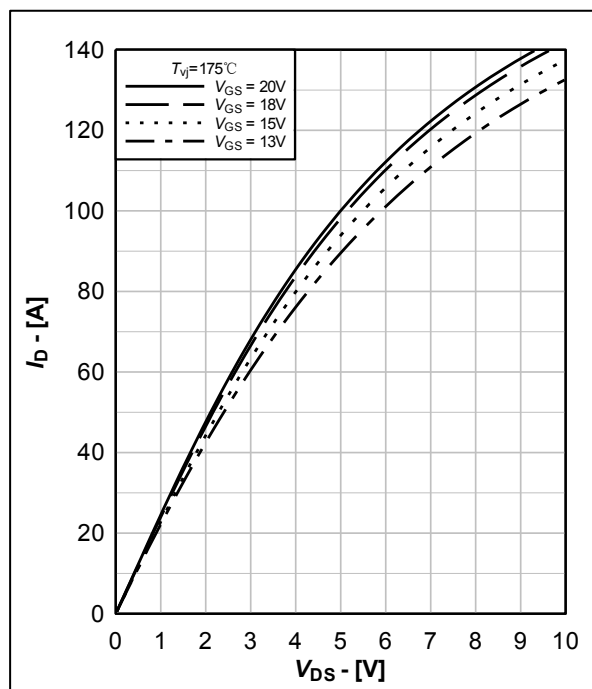


图3. 输出特性典型曲线, $I_D = f(V_{DS})$, $T_{vj} = 175\text{ }^{\circ}\text{C}$
Fig.3 Typical output characteristics, $I_D = f(V_{DS})$, $T_{vj} = 175\text{ }^{\circ}\text{C}$

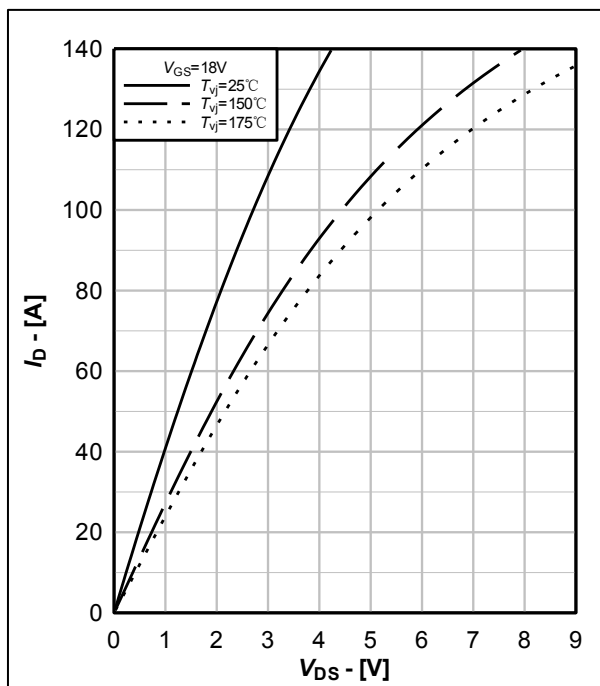


图4. 输出特性典型曲线, $I_D = f(V_{DS})$
Fig.4 Typical output characteristics, $I_D = f(V_{DS})$

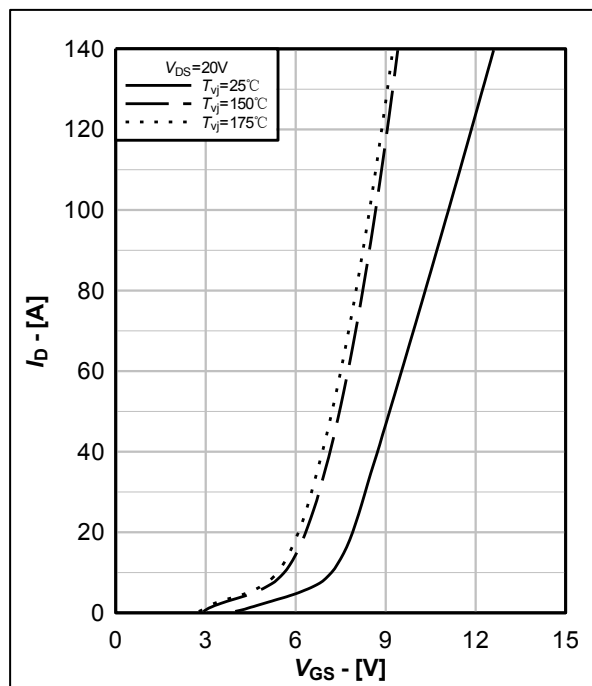


图5. 传输特性典型曲线, $I_D = f(V_{GS})$
Fig.5 Typical transfer characteristics, $I_D = f(V_{GS})$

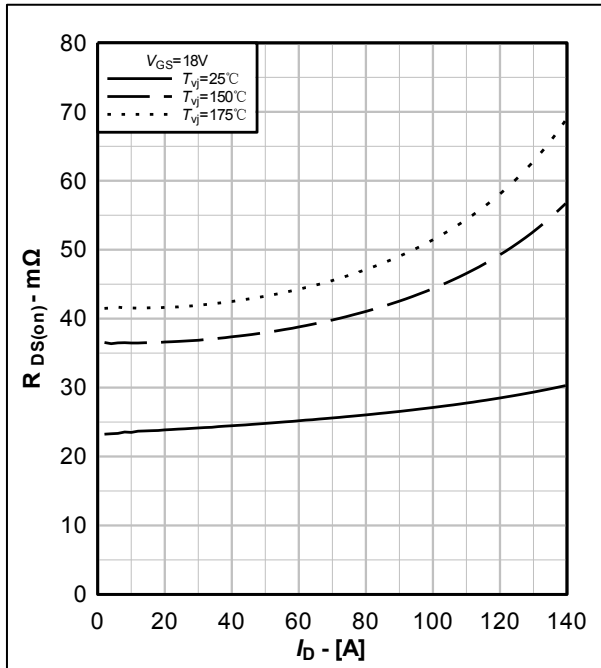


图6. 导通电阻典型曲线, $R_{DS(on)} = f(I_D)$
Fig.6 Typical On-Resistance characteristics, $R_{DS(on)} = f(I_D)$

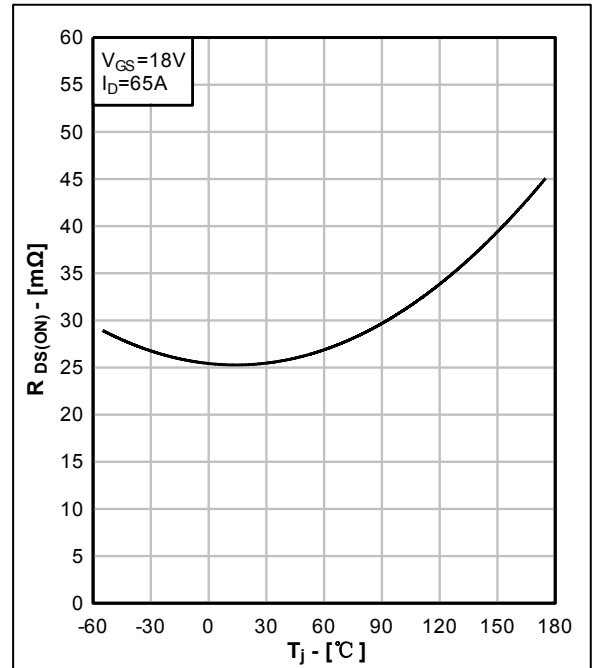


图7. 导通电阻典型曲线, $R_{DS(on)} = f(T_J)$
Fig.7 Typical On-Resistance characteristics, $R_{DS(on)} = f(T_J)$

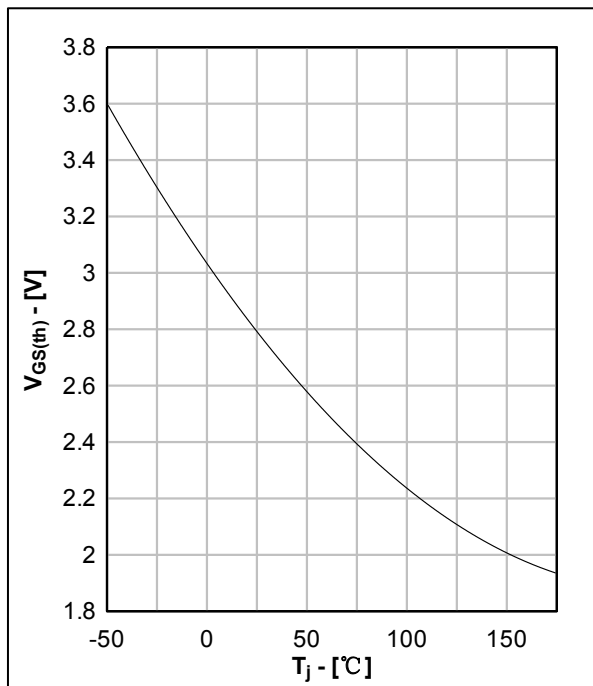


图8. 阈值电压典型曲线, $V_{GS(th)} = f(T_J)$
Fig.8 Typical $V_{GS(th)}$ characteristics, $V_{GS(th)} = f(T_J)$

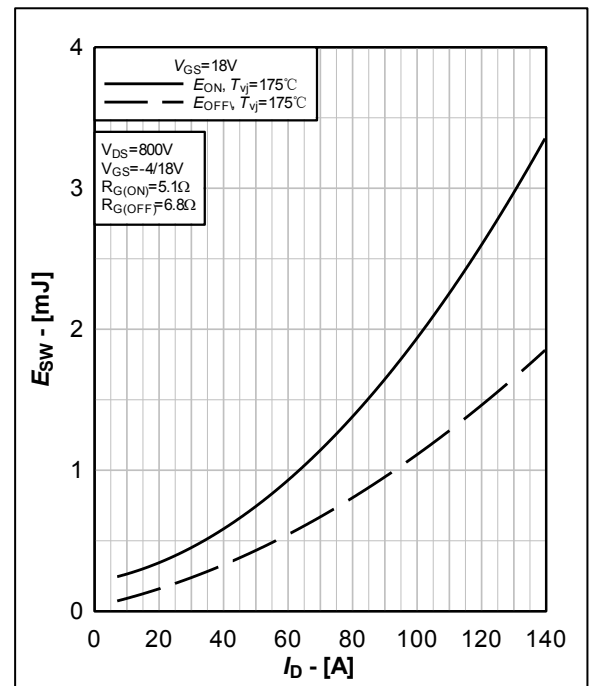


图9. MOSFET开关损耗典型曲线, $E_{off} = f(I_D)$, $E_{on} = f(I_D)$
Fig.9 Typical MOSFET switching energy, $E_{off} = f(I_D)$, $E_{on} = f(I_D)$

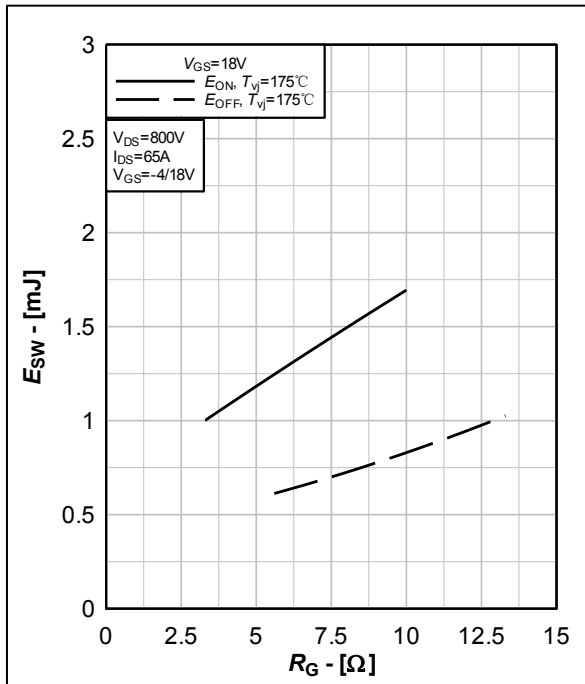


图10. MOSFET开关损耗典型曲线, $E_{on} = f(R_G)$, $E_{off} = f(R_G)$
Fig.10 Typical MOSFET switching energy, $E_{on} = f(R_G)$, $E_{off} = f(R_G)$

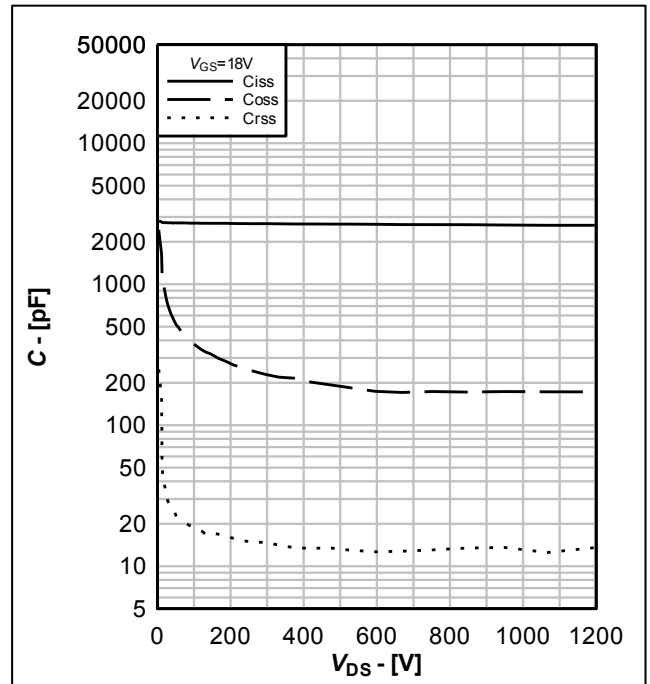


图11. 电容特性典型曲线, $C = f(V_{DS})$
Fig.11 Typical capacity characteristic, $C = f(V_{DS})$

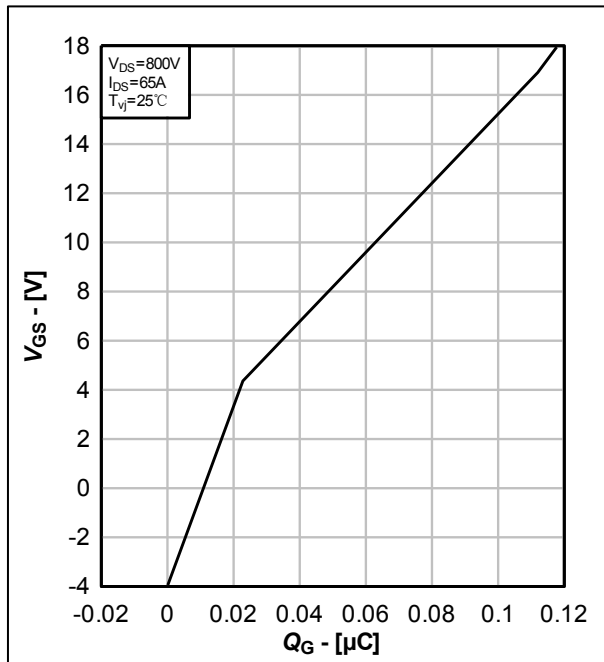


图12. 栅极电荷特性典型曲线, $V_{GS} = f(Q_G)$
Fig.12 Typical gate charge characteristic, $V_{GS} = f(Q_G)$

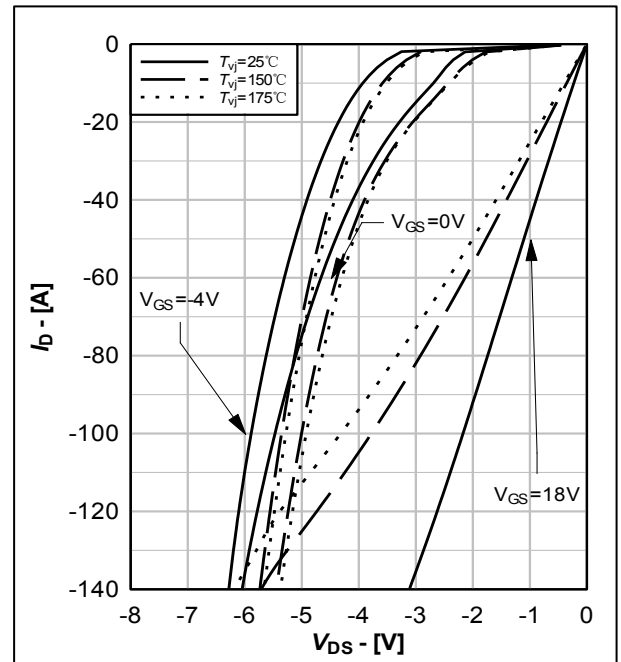


图13. 体二极管及第三象限输出特性典型曲线, $I_D = f(V_{DS})$
Fig.13 Typical body diode output and 3rd quadrant characteristic, $I_D = f(V_{DS})$

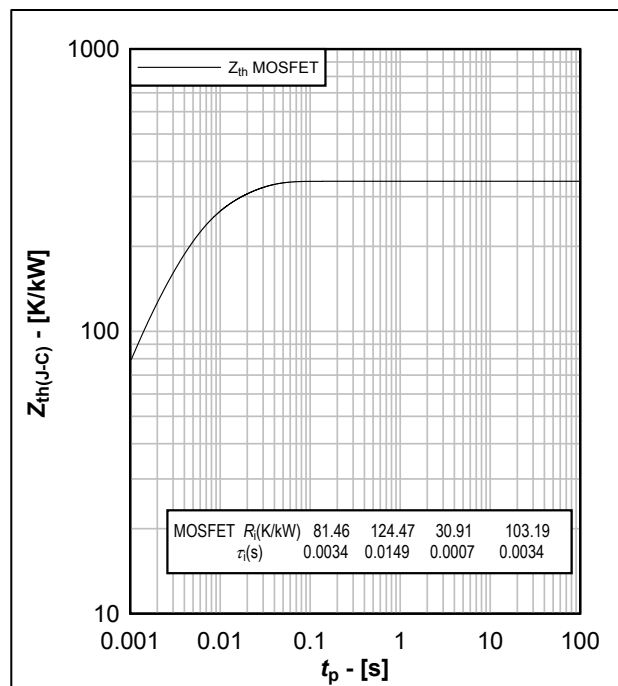
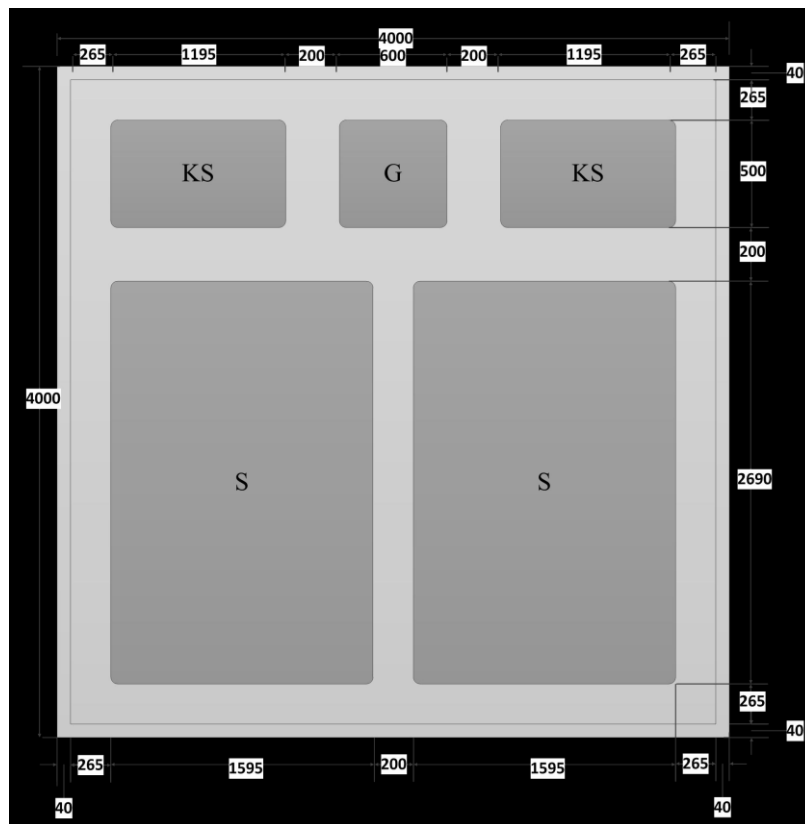


图14. 瞬态热阻抗曲线, $Z_{th(J-C)} = f(t_p)$
Fig.14 Transient thermal impedance, $Z_{th(J-C)} = f(t_p)$

工艺参数值
Mechanical Parameters

芯片尺寸 Chip size	4.00×4.00	mm ²
源极键合区尺寸(不包含开尔文源级) Source pad size (excl. Kelvin Source pad)	2×(1.595×2.69)	mm ²
栅极键合区尺寸 Gate pad size	0.6×0.5	mm ²
总面积 Area total	16.00	mm ²
厚度 Thickness	150±10	μm
晶圆尺寸 Wafer size	150	mm
每片晶圆上最大芯片数 Max. possible chips per wafer	894	
正面金属 Frontside (Source and Gate) metal	Al:5.0μm	
背面金属 Backside (Drain) metal	Ti:Ni:Ag (0.05:0.5:0.5μm)	
正面钝化 Passivation frontside	Polyimide	
建议存储环境 Recommended storage environment	存储在原始容器中, 23°C 干燥氮气柜小于 6 个月 Store in original container, in dry nitrogen, <6 months at an ambient temperature of 23°C	



S=源极 G=栅极 KS=开尔文源极 单位：微米

S=Source G=Gate KS=Kelvin Source Unit: μm

图 16. 芯片外观尺寸

Fig. 16 Chip drawing

株洲中车时代半导体有限公司

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