

关键参数

Key Parameters

V_{DSmax}		1200	V
$R_{DS(on)}$	Typ.	16	mΩ
I_D	Max.	140	A

典型应用

Typical Application

- OBC On Board Charger
- DC-DC DC-DC Converter
- 充电桩 Battery Chargers
- 光伏逆变 Solar Inverters

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

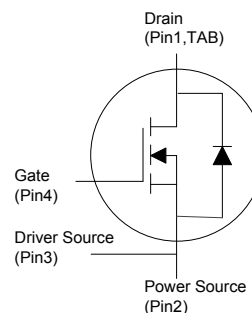


图 1. 电路结构

Fig. 1 Circuit configuration

器件外形

Device Appearance

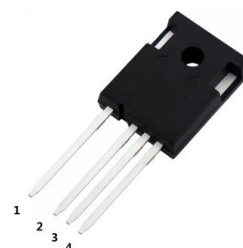


图 2. 模块外形

Fig. 2 Device appearance

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_{DSS}	漏源极电压 Drain-source voltage	$V_{GS}=0V, T_C \geq 25^\circ C$	1200	V
V_{GSS}	栅源电压 Gate-source voltage	$T_C=25^\circ C$	-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 $T_{vj\ max}$	$T_C=25^\circ C, T_{vj\ max}=175^\circ C$	140	A
		$T_C=100^\circ C, T_{vj\ max}=175^\circ C$	98	A
I_{DM}	最大重复正向电流, 由 $T_{vj\ max}$ 限制 Maximum repetitive forward current, limited by $T_{vj\ max}$	$t_P=1ms$	280	A
$T_{vj\ max}$	最大允许结温 Max. Junction temperature		175	$^\circ C$
$T_{vj(op)}$	工作结温 Operation junction temperature		-55...+175	$^\circ C$

T_{stg}	存储温度 Storage temperature range		-55...+150	°C
M	安装力矩 - M3 Mounting Torque - M3		0.6	Nm

电特性值
Electrical Characteristics

 除非特别声明，否则 $T_{vj} = 25\text{ °C}$
 $T_{vj} = 25\text{ °C}$ 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	$V_{GS} = 0V, V_{DS} = V_{DSS}$			50	μA
I_{GSS}	栅极漏电流 Gate leakage current	$V_{GS} = V_{GSS}, V_{DS} = 0V$			250	nA
$V_{GS(th)}^{(*)1}$	栅极-源极阈值电压 Gate threshold voltage	$I_D = 10\text{ mA}, V_{GS} = V_{DS}$	2.0	2.6	3.2	V
$R_{DS(on)}$	漏极-源极通态电阻 Drain-source on-state resistance	$V_{GS} = 18V, I_D = 81A$		16	21	m Ω
		$V_{GS} = 18V, I_D = 81A, T_{vj} = 175\text{ °C}$		26.4		m Ω
g_{fs}	跨导 Forward transconductance	$V_{DS} = 20V, I_D = 81A$		33		S
C_{iss}	输入电容 Input capacitance	$V_{DS} = 1000V, V_{GS} = 0V,$ $f = 100kHz, V_{AC} = 30mV$		4140		pF
C_{oss}	输出电容 Output capacitance			254		pF
C_{rss}	反向传输电容 Reverse transfer capacitance			15		pF
E_{oss}	电容存储能量 C_{oss} Stored Energy			146		μJ
R_{Gint}	内部栅极电阻 Internal gate resistor	$V_{GS} = 0V$		6.3		Ω
Q_{gs}	栅源电荷 Gate to source charge	$I_D = 140A, V_{DS} = 800V,$ $V_{GS} = -4/+18V$		45		nC
Q_{gd}	栅漏电荷 Gate to drain charge			124		nC
Q_g	总栅极电荷 Total gate charge			181		nC
V_{SD}	二极管正向电压 Diode forward voltage	$I_{SD} = 81A, V_{GS} = -4V$		5.0		V
		$I_{SD} = 81A, V_{GS} = -4V, T_{vj} = 175\text{ °C}$		4.5		V

注意: 1.(*1)表示做过预处理后的测试值

Note: 1.(*1)Indicates $V_{GS(th)}$ is pre-processed).

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
$t_{d(off)}$	关断延迟时间 Turn-off delay time	$I_D=56\text{A}$, $V_{DS}=800\text{V}$, $V_{GS}=-4/+18\text{V}$, $R_{G(OFF)}=0\Omega$, $dv/dt=31480\text{V}/\mu\text{s}$ $(T_{vj}=175\text{ }^{\circ}\text{C})$.	$T_{vj}=25\text{ }^{\circ}\text{C}$	61		ns
			$T_{vj}=175\text{ }^{\circ}\text{C}$	118		
t_f	下降时间 Fall time		$T_{vj}=25\text{ }^{\circ}\text{C}$	22		ns
			$T_{vj}=175\text{ }^{\circ}\text{C}$	23		
E_{OFF}	关断损耗 Turn-off energy loss		$T_{vj}=25\text{ }^{\circ}\text{C}$	310		μJ
			$T_{vj}=175\text{ }^{\circ}\text{C}$	352		
$t_{d(on)}$	开通延迟时间 Turn-on delay time	$I_D=56\text{A}$, $V_{DS}=800\text{V}$, $V_{GS}=-4/+18\text{V}$, $R_{G(ON)}=1.3\Omega$, $di/dt=1500\text{A}/\mu\text{s}$ $(T_{vj}=175\text{ }^{\circ}\text{C})$.	$T_{vj}=25\text{ }^{\circ}\text{C}$	25		ns
			$T_{vj}=175\text{ }^{\circ}\text{C}$	23		
t_r	上升时间 Rise time		$T_{vj}=25\text{ }^{\circ}\text{C}$	14		ns
			$T_{vj}=175\text{ }^{\circ}\text{C}$	14		
E_{ON}	开通损耗 Turn-on energy loss		$T_{vj}=25\text{ }^{\circ}\text{C}$	1010		μJ
			$T_{vj}=175\text{ }^{\circ}\text{C}$	1120		
Q_{rr}	二极管反向恢复电荷 Diode reverse recovery charge	$I_D=56\text{A}$, $V_{DS}=800\text{V}$, $-di_{SD}/dt=1500\text{A}/\mu\text{s}$ $(T_{vj}=175\text{ }^{\circ}\text{C})$.	$T_{vj}=25\text{ }^{\circ}\text{C}$	441		nC
			$T_{vj}=175\text{ }^{\circ}\text{C}$	620		
I_{rr}	二极管反向恢复电流 Diode reverse recovery current		$T_{vj}=25\text{ }^{\circ}\text{C}$	16		A
			$T_{vj}=175\text{ }^{\circ}\text{C}$	19		

热学特性
Thermal Characteristics

符号 (Symbol)	参数名称 (Parameter)	条件 (Test Conditions)	最小值 (Min)	典型值 (Typ)	最大值 (Max)	单位 (Unit)
$R_{th(j-c)}$	结到壳热阻 Thermal resistance, junction – case	$T_C=25\text{ }^{\circ}\text{C}, T_{vj}=175\text{ }^{\circ}\text{C}$		0.24		K/W

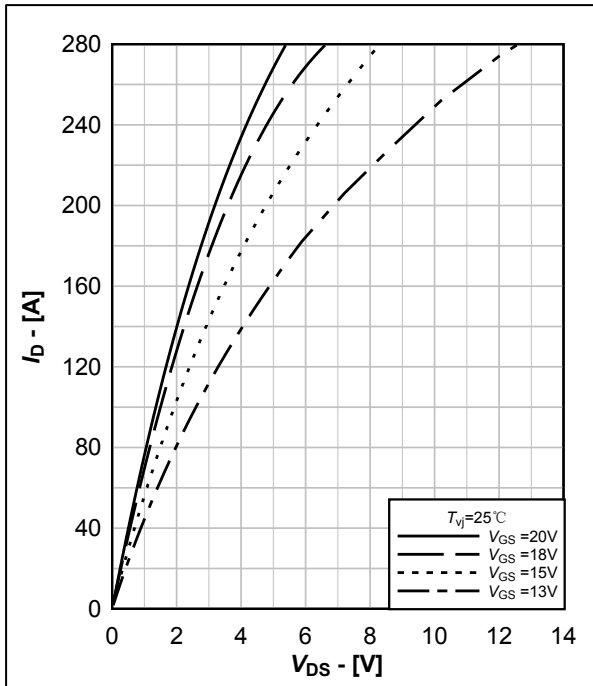


图 3. 输出特性典型曲线, $I_D = f(V_{DS})$, $T_{vj} = 25\text{ }^{\circ}\text{C}$

Fig.3 Typical output characteristics, $I_D = f(V_{DS})$, $T_{vj} = 25\text{ }^{\circ}\text{C}$

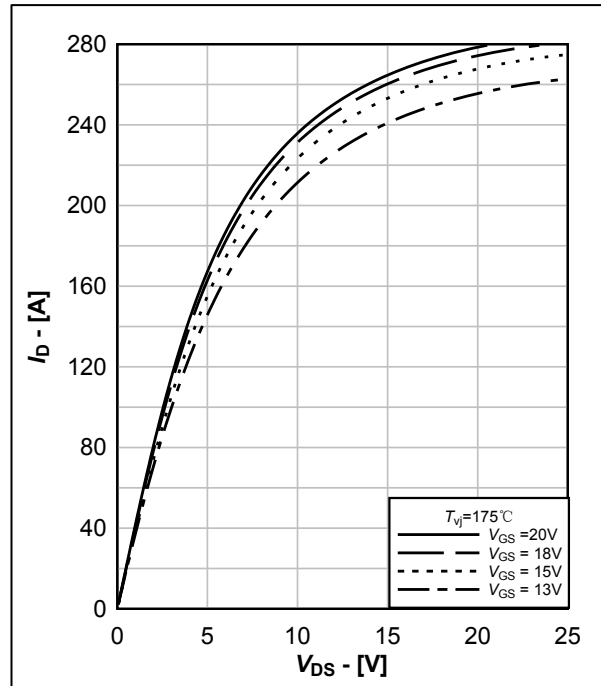


图 4. 输出特性典型曲线, $I_D = f(V_{DS})$, $T_{vj} = 175\text{ }^{\circ}\text{C}$

Fig.4 Typical output characteristics, $I_D = f(V_{DS})$, $T_{vj} = 175\text{ }^{\circ}\text{C}$

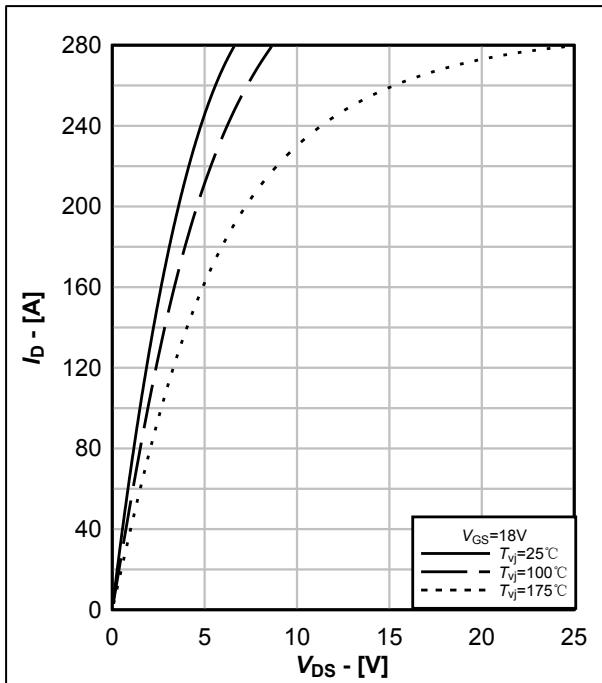


图 5. 输出特性典型曲线, $I_D = f(V_{DS})$

Fig.5 Typical output characteristics, $I_D = f(V_{DS})$

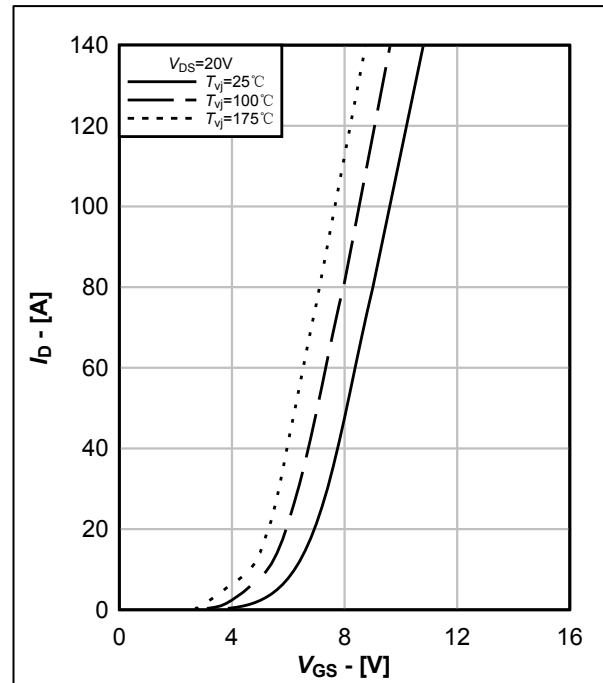


图 6. 传输特性典型曲线, $I_D = f(V_{GS})$

Fig.6 Typical transfer characteristics, $I_D = f(V_{GS})$

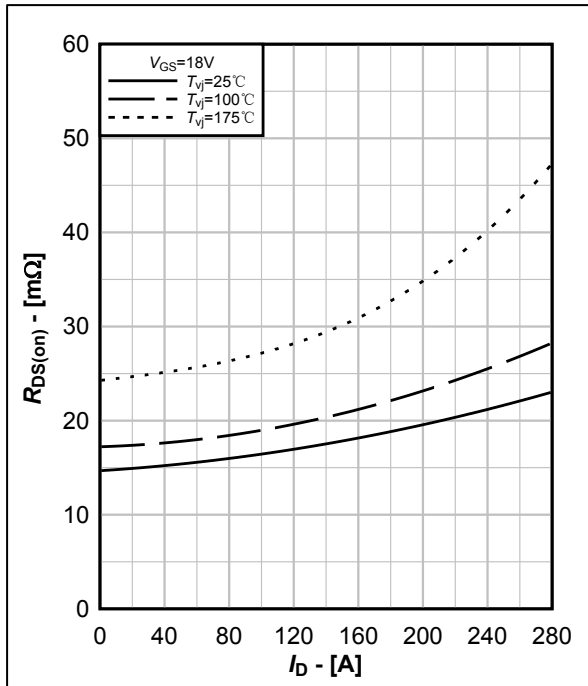

图 7. 导通电阻典型曲线, $R_{DS(on)} = f(I_D)$

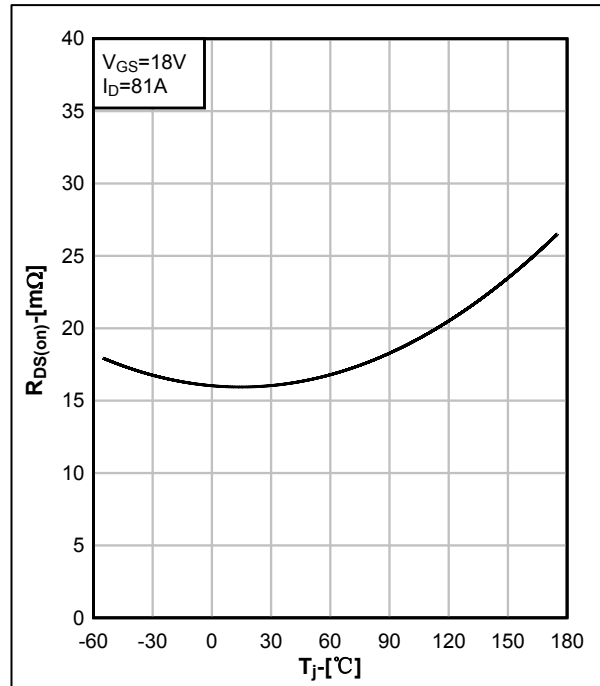
Fig.7 Typical On-Resistance characteristics, $R_{DS(on)} = f(I_D)$

图 8. 导通电阻典型曲线, $R_{DS(on)} = f(T_j)$

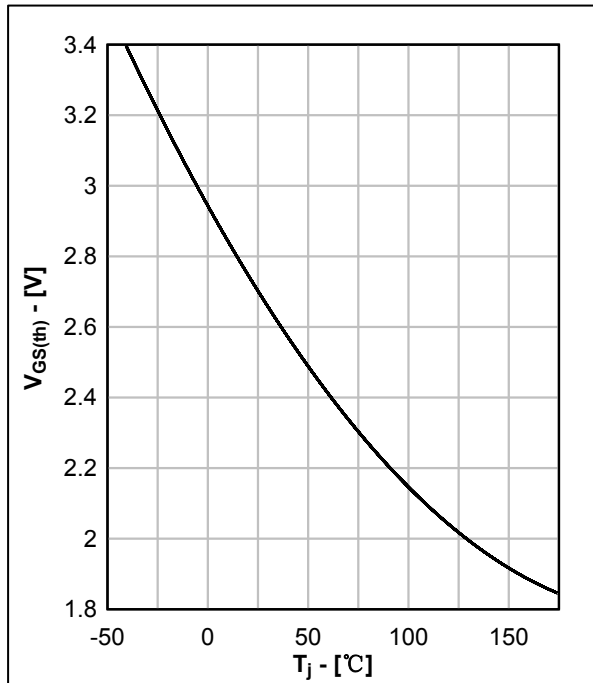
Fig.8 Typical On-Resistance characteristics, $R_{DS(on)} = f(T_j)$

图 9. 阈值电压典型曲线, $V_{GS(th)} = f(T_j)$

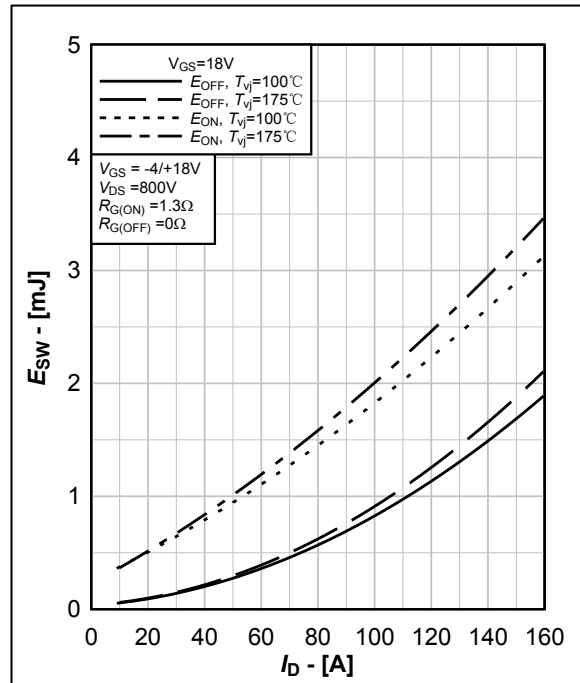
Fig.9 Typical $V_{GS(th)}$ characteristics, $V_{GS(th)} = f(T_j)$

图 10. MOSFET 开关损耗典型曲线, $E_{off} = f(I_D)$, $E_{on} = f(I_D)$

Fig.10 Typical MOSFET switching energy, $E_{off} = f(I_D)$, $E_{on} = f(I_D)$

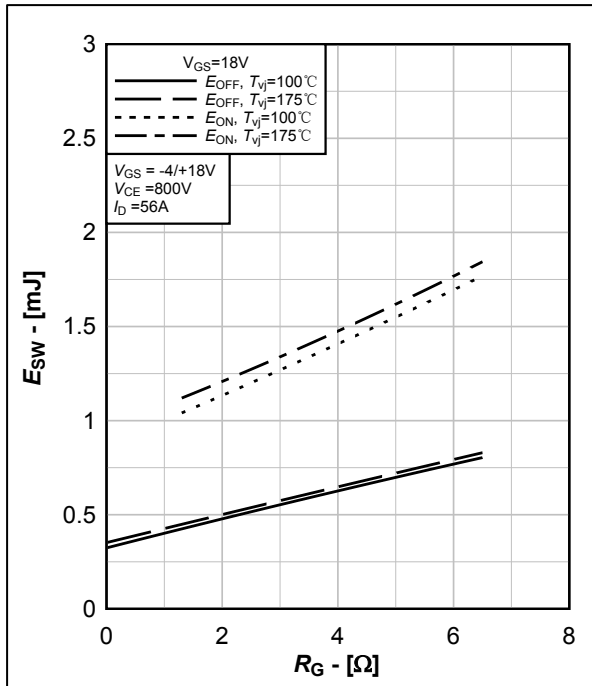


图 11. MOSFET 开关损耗典型曲线, $E_{on} = f(R_G)$, $E_{off} = f(R_G)$

Fig.11 Typical MOSFET switching energy, $E_{on} = f(R_G)$, $E_{off} = f(R_G)$

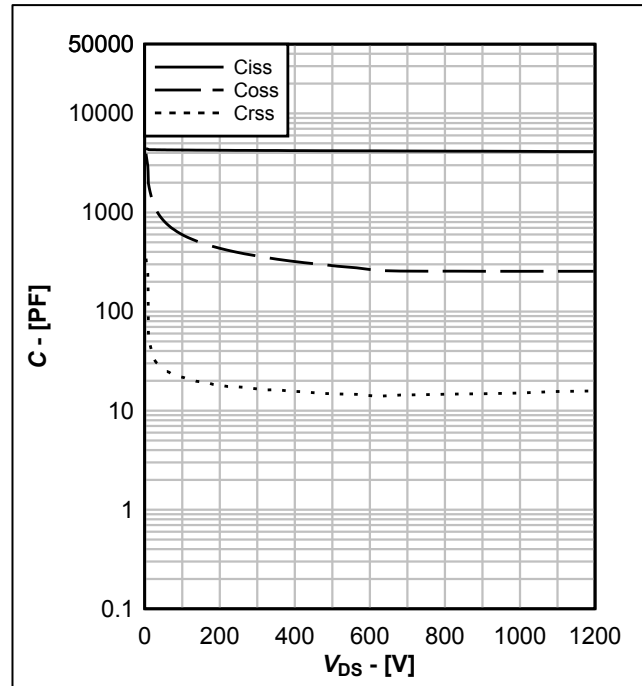


图 12. 电容特性典型曲线, $C = f(V_{DS})$

Fig.12 Typical capacity characteristic, $C = f(V_{DS})$

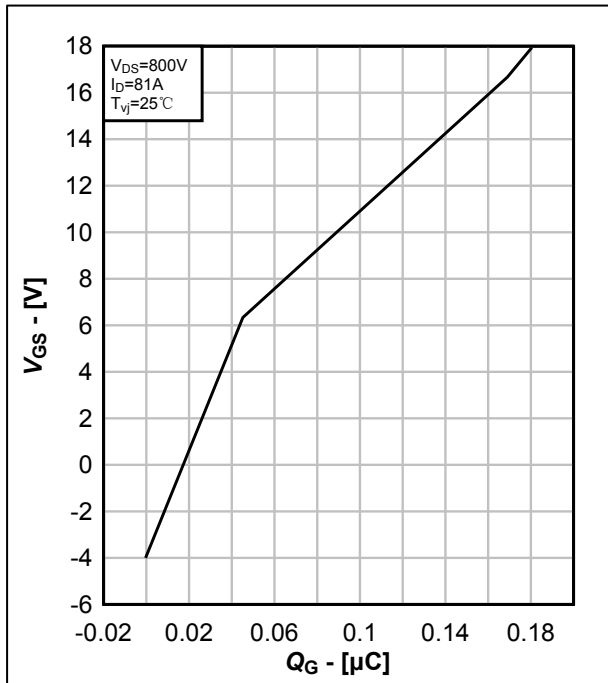


图 13. 栅极电荷特性典型曲线, $V_{GS} = f(Q_G)$

Fig.13 Typical gate charge characteristic, $V_{GS} = f(Q_G)$

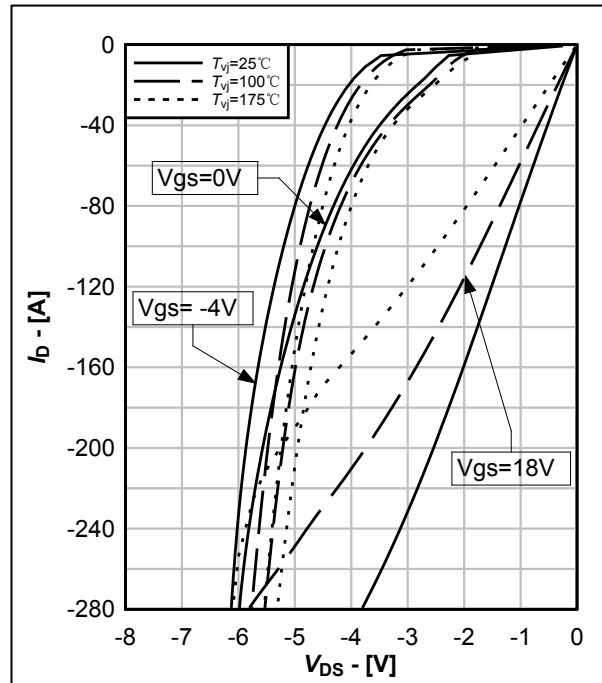


图 14. 体二极管及第三象限输出特性典型曲线, $I_D = f(V_{DS})$

Fig.14 Typical body diode output and 3rd quadrant characteristic, $I_D = f(V_{DS})$

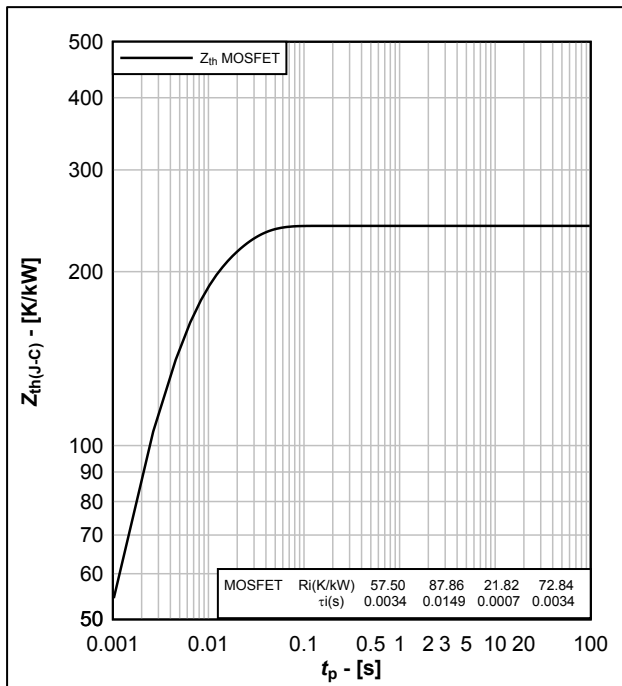


图 15. 瞬态热阻抗曲线, $Z_{th(J-C)} = f(t_p)$

Fig.15 Transient thermal impedance, $Z_{th(J-C)} = f(t_p)$

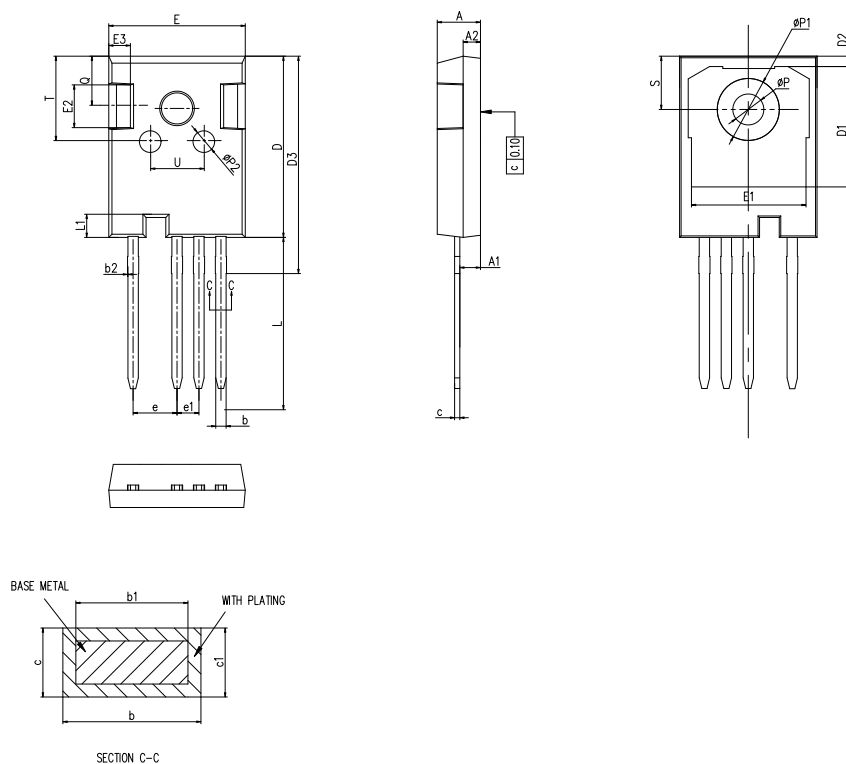


图 16. 封装尺寸

Fig. 16 Package Dimensions

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