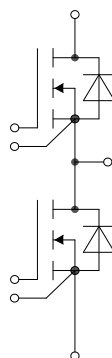


62mm C-Series 模块 采用 CoolSiC™ Trench MOSFET
 62mm C-Series module with CoolSiC™ Trench MOSFET

初步数据 / Preliminary Data



$V_{DSS} = 1200V$
 $I_{D\ nom} = 250A / I_{DRM} = 500A$

潜在应用

- DC/DC 变换器
- UPS系统
- 太阳能应用
- 高频开关应用

Potential Applications

- DC/DC converter
- UPS systems
- Solar applications
- High Frequency Switching application

电气特性

- 低开关损耗
- 高电流密度

Electrical Features

- Low switching losses
- High current density

Module Label Code

Barcode Code 128



DMX - Code



Content of the Code

	Digit
Module Serial Number	1 - 5
Module Material Number	6 - 11
Production Order Number	12 - 19
Datecode (Production Year)	20 - 21
Datecode (Production Week)	22 - 23

初步数据
 Preliminary Data

MOSFET / MOSFET

最大额定值 / Maximum Rated Values

漏源极电压 Drain-source voltage		$T_{vj} = 25^{\circ}\text{C}$	V_{DSS}	1200	V
直流漏极电流 DC drain current	$T_{vj} = 175^{\circ}\text{C}, V_{GS} = 15\text{ V}$	$T_C = 65^{\circ}\text{C}$	$I_{D\text{ nom}}$	250	A
脉冲漏极电流 Pulsed drain current	经设计验证, t_p 由 $T_{vj\text{ max}}$ 限定 verified by design, t_p limited by $T_{vj\text{ max}}$		$I_{D\text{ pulse}}$	500	A
栅源峰值电压 Gate-source voltage			V_{GSS}	-10 / 20	V

特征值 / Characteristic Values

				min.	typ.	max.	
漏源通态电阻 Drain-source on resistance	$I_D = 250\text{ A}$ $V_{GS} = 15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$R_{DS\text{ on}}$		5,81 7,56 8,50		m Ω
栅极阈值电压 Gate threshold voltage	$I_D = 80,0\text{ mA}, V_{DS} = V_{GS}, T_{vj} = 25^{\circ}\text{C}$ (tested after 1ms pulse at $V_{GS} = +20\text{ V}$)		$V_{GS(th)}$	3,45	4,50	5,15	V
总的栅极电荷 Total gate charge	$V_{GS} = -5\text{ V} / 15\text{ V}, V_{DS} = 800\text{ V}$		Q_G		0,496		μC
内部栅极电阻 Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		R_{Gint}		1,0		Ω
输入电容 Input capacitance	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}$ $V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$		C_{iss}		14,7		nF
输出电容 Output capacitance	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}$ $V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$		C_{oss}		0,88		nF
反向传输电容 Reverse transfer capacitance	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}$ $V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$		C_{rss}		0,112		nF
C_{oss} stored energy	$T_{vj} = 25^{\circ}\text{C}$ $V_{DS} = 800\text{ V}, V_{GS} = -5\text{ V} / 15\text{ V}$		E_{oss}		352		μJ
零栅电压漏极电流 Zero gate voltage drain current	$V_{DS} = 1200\text{ V}, V_{GS} = -5\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$	I_{DSS}		0,80	660	μA
栅极漏电流 Gate-source leakage current	$V_{DS} = 0\text{ V}$ $T_{vj} = 25^{\circ}\text{C}$	$V_{GS} = 20\text{ V}$ $V_{GS} = -10\text{ V}$	I_{GSS}			400	nA
开通延迟时间(电感负载) Turn on delay time, inductive load	$I_D = 250\text{ A}, V_{DS} = 600\text{ V}$ $V_{GS} = -5\text{ V} / 15\text{ V}$ $R_{Gon} = 3,00\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d\text{ on}}$		69,1 66,4 65,5		ns
上升时间(电感负载) Rise time, inductive load	$I_D = 250\text{ A}, V_{DS} = 600\text{ V}$ $V_{GS} = -5\text{ V} / 15\text{ V}$ $R_{Gon} = 3,00\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_r		33,7 32,0 31,9		ns
关断延迟时间(电感负载) Turn off delay time, inductive load	$I_D = 250\text{ A}, V_{DS} = 600\text{ V}$ $V_{GS} = -5\text{ V} / 15\text{ V}$ $R_{Goff} = 3,90\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d\text{ off}}$		124 134 134		ns
下降时间(电感负载) Fall time, inductive load	$I_D = 250\text{ A}, V_{DS} = 600\text{ V}$ $V_{GS} = -5\text{ V} / 15\text{ V}$ $R_{Goff} = 3,90\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_f		43,9 45,2 45,2		ns
开通损耗(每脉冲) Turn-on energy loss per pulse	$I_D = 250\text{ A}, V_{DS} = 600\text{ V}, L\sigma = 10\text{ nH}$ $di/dt = 8,95\text{ kA}/\mu\text{s}$ ($T_{vj} = 150^{\circ}\text{C}$) $V_{GS} = -5\text{ V} / 15\text{ V}, R_{Gon} = 3,00\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{on}		4,26 4,75 4,95		mJ
关断损耗(每脉冲) Turn-off energy loss per pulse	$I_D = 250\text{ A}, V_{DS} = 600\text{ V}, L\sigma = 10\text{ nH}$ $du/dt = 12,9\text{ kV}/\mu\text{s}$ ($T_{vj} = 150^{\circ}\text{C}$) $V_{GS} = -5\text{ V} / 15\text{ V}, R_{Goff} = 3,90\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{off}		5,72 5,99 5,99		mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个MOSFET / per MOSFET		R_{thJC}			0,141	K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个MOSFET / per MOSFET $\lambda_{\text{Paste}} = 1\text{ W}/(\text{m}\cdot\text{K}) / \lambda_{\text{grease}} = 1\text{ W}/(\text{m}\cdot\text{K})$		R_{thCH}		0,0490		K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj\text{ op}}$	-40		150	$^{\circ}\text{C}$

Body diode

最大额定值 / Maximum Rated Values

DC body diode forward current	$T_{vj} = 175^{\circ}\text{C}, V_{GS} = -5\text{ V}$	$T_C = 65^{\circ}\text{C}$	I_{SD}	110	A
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特征值 / Characteristic Values

				min.	typ.	max.	
正向电压 Forward voltage	$I_{SD} = 250\text{ A}, V_{GS} = -5\text{ V}$ $I_{SD} = 250\text{ A}, V_{GS} = -5\text{ V}$ $I_{SD} = 250\text{ A}, V_{GS} = -5\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	V_{SD}		4,80 4,55 4,50	5,85	V

初步数据
 Preliminary Data

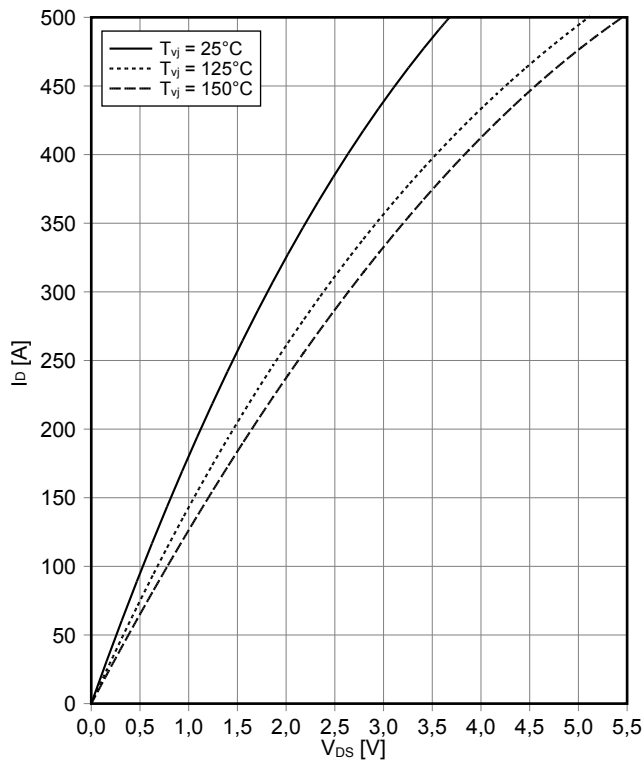
模块 / Module

绝缘测试电压 Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V _{ISOL}	4,0		kV
模块基板材料 Material of module baseplate			Cu		
内部绝缘 Internal isolation	基本绝缘 (class 1, IEC 61140) basic insulation (class 1, IEC 61140)		Al ₂ O ₃		
爬电距离 Creepage distance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		29,0 23,0		mm
电气间隙 Clearance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		23,0 11,0		mm
相对电痕指数 Comperative tracking index		CTI	> 400		
相对温度指数 (电) RTI Elec.	住房 housing	RTI	140		°C
			min.	typ.	max.
杂散电感, 模块 Stray inductance module		L _{sCE}	20		nH
模块引线电阻, 端子-芯片 Module lead resistance, terminals - chip	T _c = 25°C, 每个开关 / per switch	R _{CC+EE'}	0,485		mΩ
储存温度 Storage temperature		T _{stg}	-40	125	°C
模块安装的安装扭矩 Mounting torque for modul mounting	螺丝 M6 根据相应的应用手册进行安装 Screw M6 - Mounting according to valid application note	M	3,00	6,00	Nm
端子联接扭矩 Terminal connection torque	螺丝 M6 根据相应的应用手册进行安装 Screw M6 - Mounting according to valid application note	M	2,5	5,0	Nm
重量 Weight		G	340		g

Important note: The selection of positive and negative gate-source voltages impacts the long-term behavior of the device. The design guidelines described in Application Note AN 2018-09 must be considered to ensure sound operation of the device over the planned lifetime.

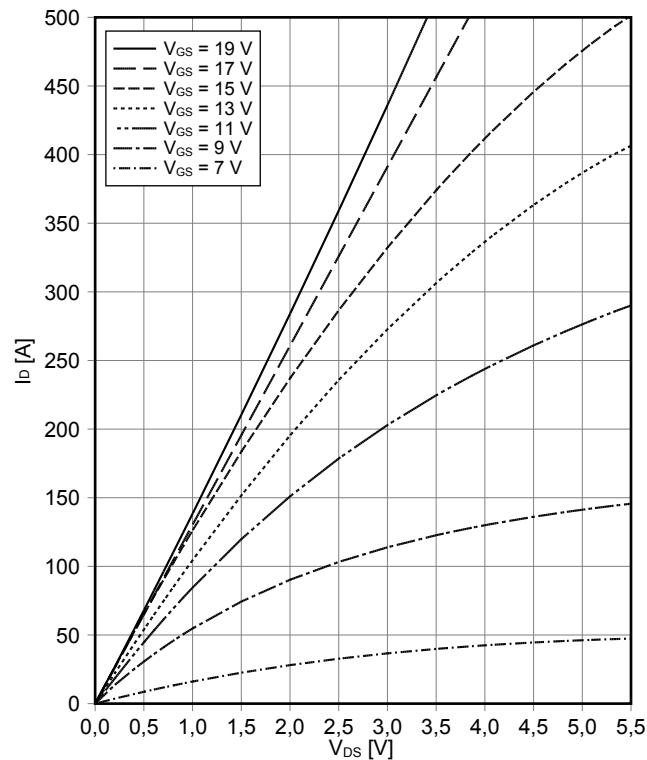
输出特性 MOSFET (典型)
output characteristic MOSFET (typical)

$I_D = f(V_{DS})$
 $V_{GS} = 15\text{ V}$



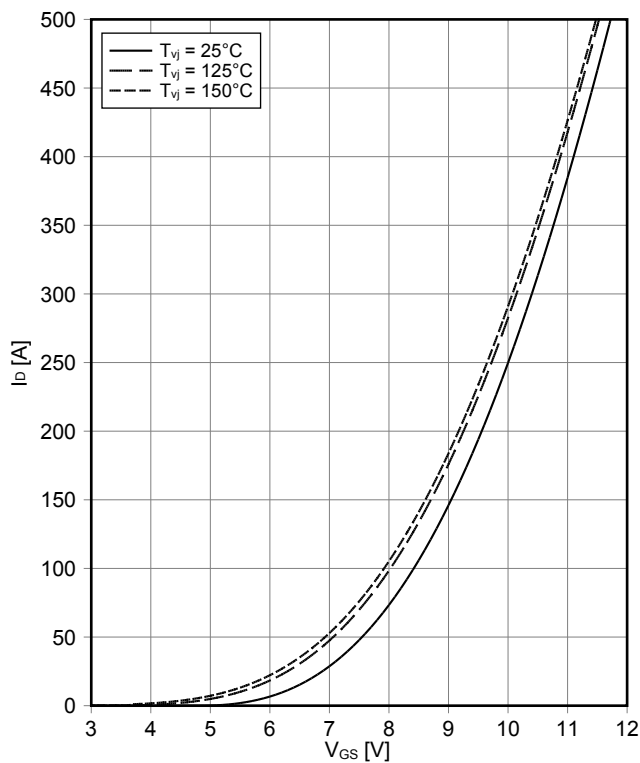
输出特性 MOSFET (典型)
output characteristic MOSFET (typical)

$I_D = f(V_{DS})$
 $T_{vj} = 150\text{ °C}$



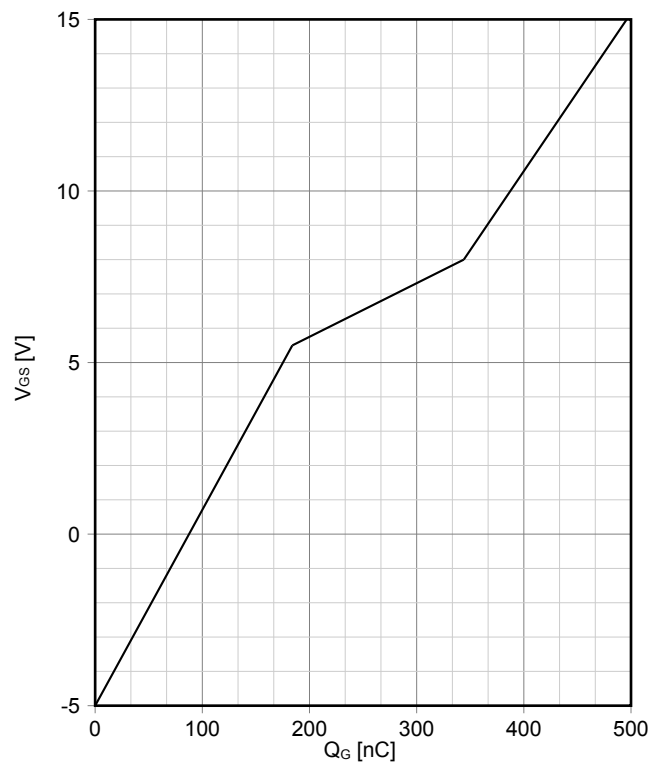
传输特性 MOSFET (典型)
transfer characteristic MOSFET (typical)

$I_D = f(V_{GS})$
 $V_{DS} = 20\text{ V}$



栅极电荷特性 MOSFET (典型)
gate charge characteristic MOSFET (typical)

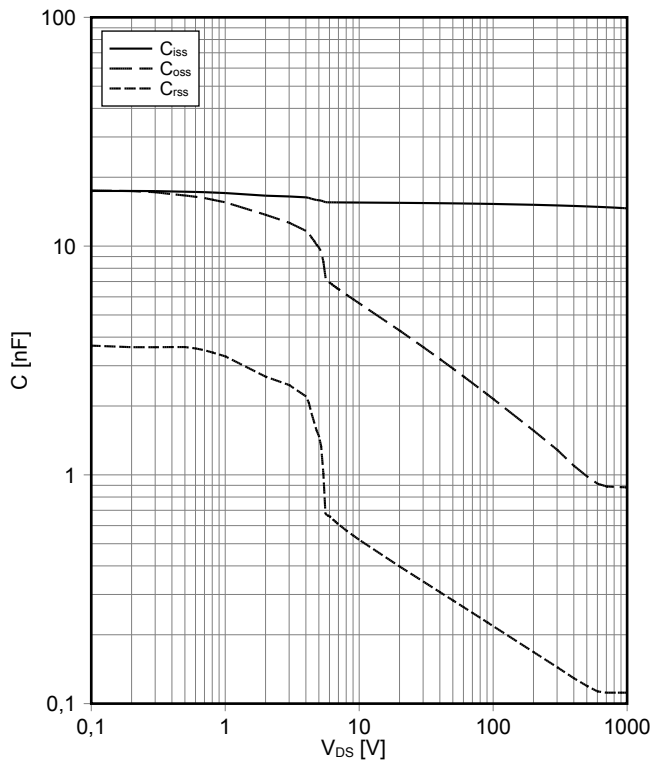
$V_{GS} = f(Q_G)$
 $V_{DS} = 800\text{ V}, I_D = 250\text{ A}, T_{vj} = 25\text{ °C}$



初步数据 Preliminary Data

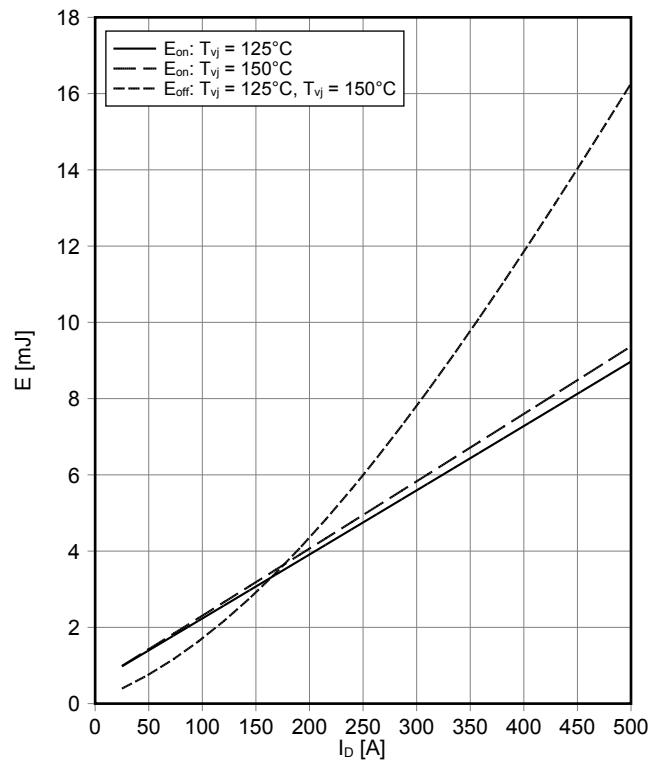
电容特性 MOSFET (典型) capacity characteristic MOSFET (typical)

$C = f(V_{DS})$
 $V_{GS} = 0\text{ V}$, $T_{vj} = 25^\circ\text{C}$, $f = 1\text{ MHz}$



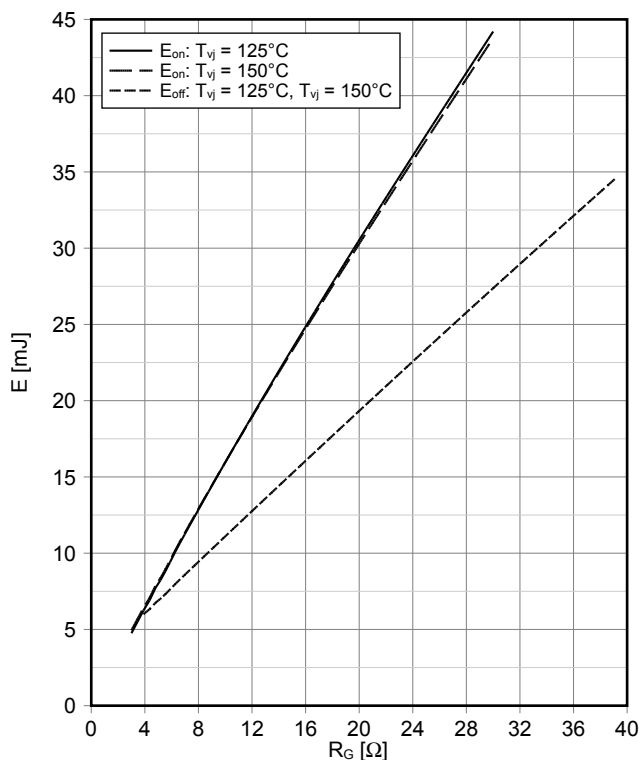
开关损耗 MOSFET (典型) switching losses MOSFET (typical)

$E_{on} = f(I_D)$, $E_{off} = f(I_D)$
 $V_{GS} = -5\text{ V} / +15\text{ V}$, $R_{Gon} = 3,0\ \Omega$, $R_{Goff} = 3,9\ \Omega$, $V_{DS} = 600\text{ V}$



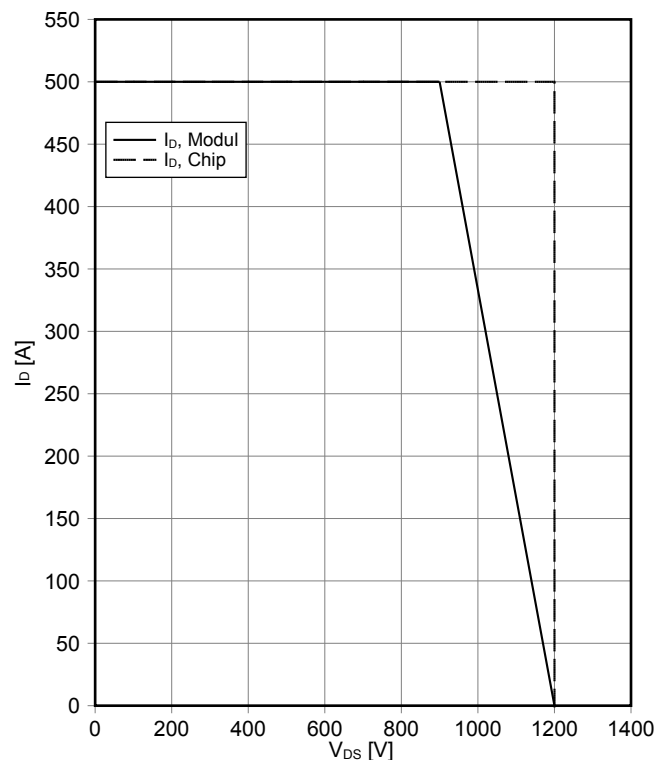
开关损耗 MOSFET (典型) switching losses MOSFET (typical)

$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
 $V_{GS} = -5\text{ V} / +15\text{ V}$, $I_D = 250\text{ A}$, $V_{DS} = 600\text{ V}$

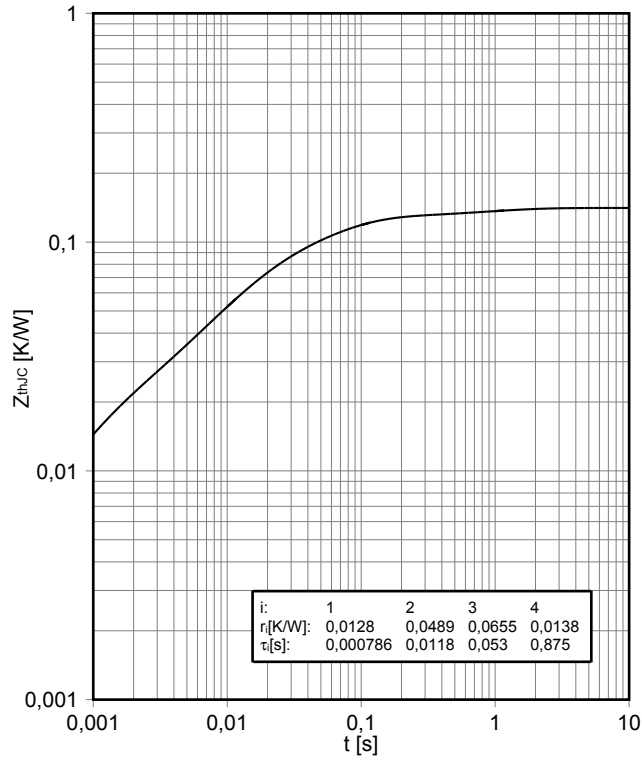


反偏安全工作区 MOSFET (RBSOA) reverse bias safe operating area MOSFET (RBSOA)

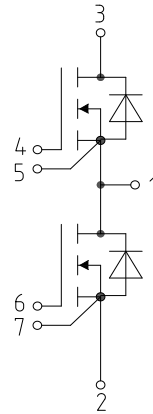
$I_D = f(V_{DS})$
 $V_{GS} = -5\text{ V} / +15\text{ V}$, $R_{Goff} = 3,9\ \Omega$, $T_{vj} = 150^\circ\text{C}$



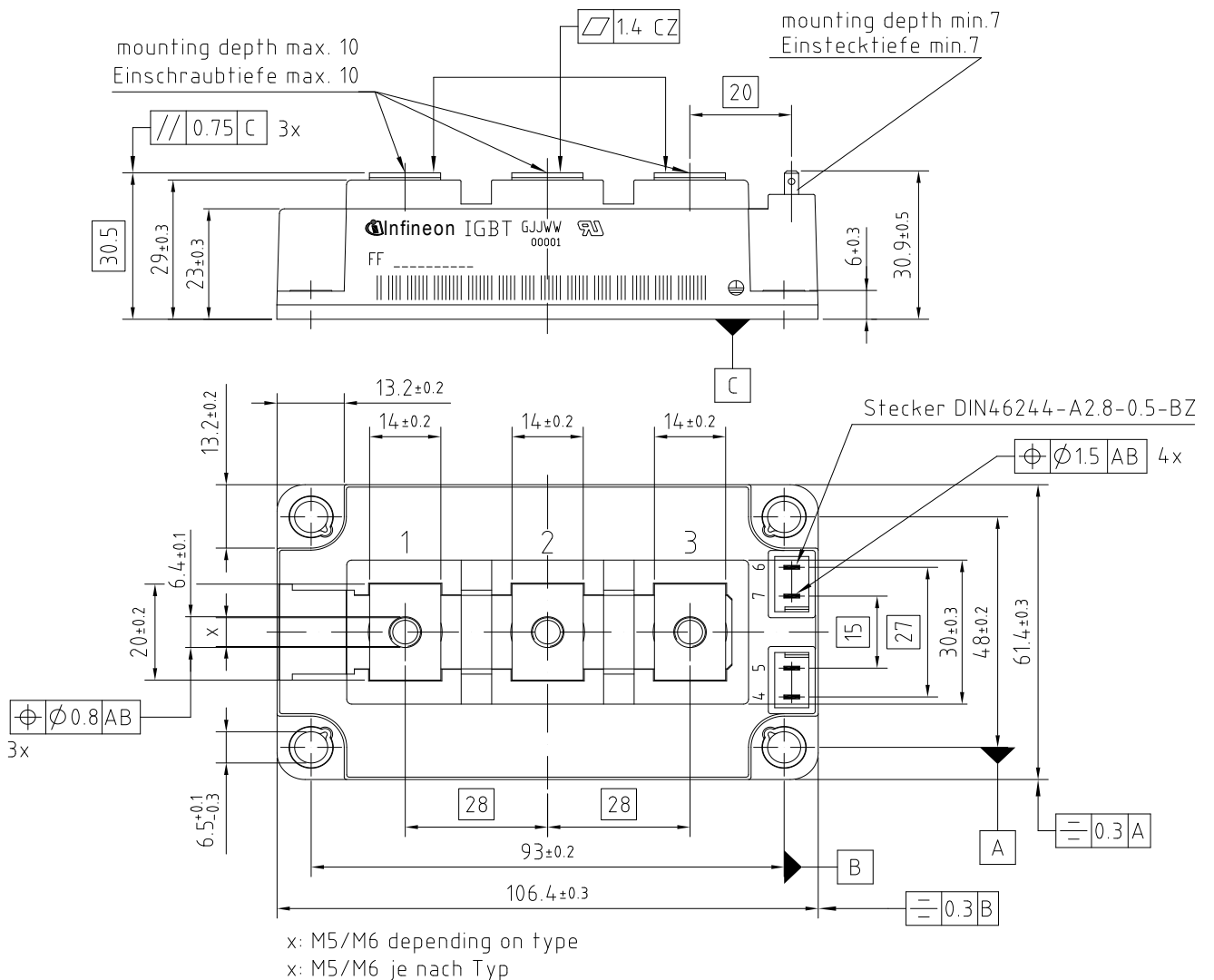
瞬态热阻抗 MOSFET
transient thermal impedance MOSFET
 $Z_{thJC} = f(t)$



接线图 / Circuit diagram



封装尺寸 / Package outlines



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