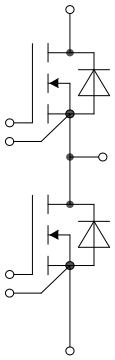
62mm C-Series 模块 采用 CoolSiC™ Trench MOSFET 和预涂导热介质
62mm C-Series module with CoolSiC™ Trench MOSFET and pre-applied Thermal Interface Material

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

机械特性
- 预涂导热介质

Mechanical Features
- Pre-applied Thermal Interface Material

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°C	V_{DSS}	1200		V
直流漏极电流 DC drain current	T_{vj} = 175°C, V_{GS} = 15 V, T_H = 30°C	$I_{D\ nom}$	250		A
脉冲漏极电流 Pulsed drain current	经设计验证，tp由Tvjmax限定 verified by design, t_p limited by T_{vjmax}	$I_{D\ pulse}$	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 A, V_{GS} = 15 V T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$R_{DS\ on}$		5,81 7,56 8,50		mΩ
栅极阈值电压 Gate threshold voltage	I_D = 80,0 mA, V_{DS} = V_{GS}, T_{vj} = 25°C (tested after 1ms pulse at V_{GS} = +20 V)	$V_{GS(th)}$	3,45	4,50	5,15	V
总的栅极电荷 Total gate charge	V_{GS} = -5 V / 15 V, V_{DS} = 800 V	Q_G		0,496		µC
内部栅极电阻 Internal gate resistor	T_{vj} = 25°C	R_{Gint}		1,0		Ω
输入电容 Input capacitance	f = 1 MHz, T_{vj} = 25°C V_{DS} = 800 V, V_{GS} = 0 V	C_{iss}		14,7		nF
输出电容 Output capacitance	f = 1 MHz, T_{vj} = 25°C V_{DS} = 800 V, V_{GS} = 0 V	C_{oss}		0,88		nF
反向传输电容 Reverse transfer capacitance	f = 1 MHz, T_{vj} = 25°C V_{DS} = 800 V, V_{GS} = 0 V	C_{rss}		0,112		nF
C_{OSS} stored energy	T_{vj} = 25°C V_{DS} = 800 V, V_{GS} = -5 V / 15 V	E_{oss}		352		µJ
零栅电压漏极电流 Zero gate voltage drain current	V_{DS} = 1200 V, V_{GS} = -5 V, T_{vj} = 25°C	I_{DSS}		0,80	660	µA
栅极漏电流 Gate-source leakage current	V_{DS} = 0 V, T_{vj} = 25°C V_{GS} = 20 V V_{GS} = -10 V	I_{GSS}			400	nA
开通延迟时间(电感负载) Turn on delay time, inductive load	I_D = 250 A, V_{DS} = 600 V, V_{GS} = -5 V / 15 V, R_{Gon} = 3,00 Ω T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$t_{d\ on}$		69,1 66,4 65,5		ns
上升时间(电感负载) Rise time, inductive load	I_D = 250 A, V_{DS} = 600 V, V_{GS} = -5 V / 15 V, R_{Gon} = 3,00 Ω T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°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 A, V_{DS} = 600 V, V_{GS} = -5 V / 15 V, R_{Goff} = 3,90 Ω T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$t_{d\ off}$		124 134 134		ns
下降时间(电感负载) Fall time, inductive load	I_D = 250 A, V_{DS} = 600 V, V_{GS} = -5 V / 15 V, R_{Goff} = 3,90 Ω T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°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 A, V_{DS} = 600 V, Lσ = 10 nH, di/dt = 8,95 kA/µs (T_{vj} = 150°C), V_{GS} = -5 V / 15 V, R_{Gon} = 3,00 Ω T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°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 A, V_{DS} = 600 V, Lσ = 10 nH, du/dt = 12,9 kV/µs (T_{vj} = 150°C), V_{GS} = -5 V / 15 V, R_{Goff} = 3,90 Ω T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{off}		5,72 5,99 5,99		mJ
结 - 散热器热阻 Thermal resistance, junction to heatsink	每个MOSFET / per MOSFET valid with IFX pre-applied thermal interface material	R_{thJH}			0,181	K/W
在开关状态下温度 Temperature under switching conditions		$T_{vj\ op}$	-40		150	°C

Body diode

最大额定值 / Maximum Rated Values

DC body diode forward current	T_{vj} = 175°C, V_{GS} = -5 V, T_H = 30°C	I_{SD}	110		A

特征值 / Characteristic Values

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

初步数据
Preliminary Data

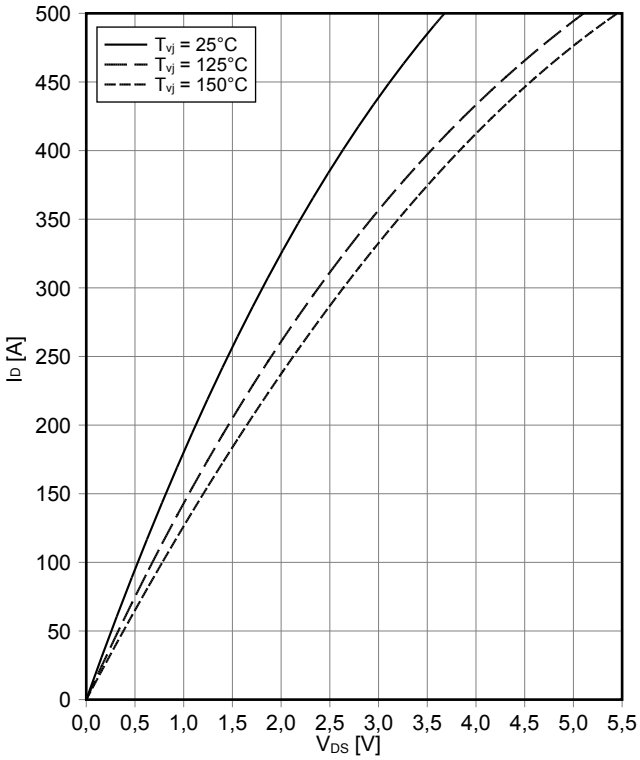
模块 / Module

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_2O_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_H = 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
最高基板工作温度 Maximum baseplate operation temperature		T_{BPmax}			125	°C
模块安装的安装扭距 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
端子联接扭距 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

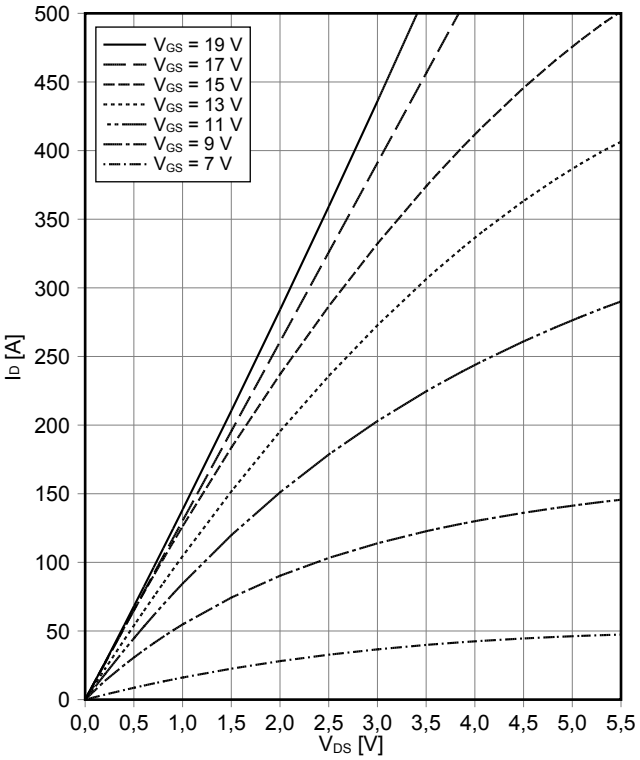
Important note: The selection of positive and negative gate-source voltages impacts the long-term behavior of the device. The design guidelines described in Application Note AN 2018-09 must be considered to ensure sound operation of the device over the planned lifetime. Storage and shipment of modules with TIM => see AN2012-07

初步数据
Preliminary Data

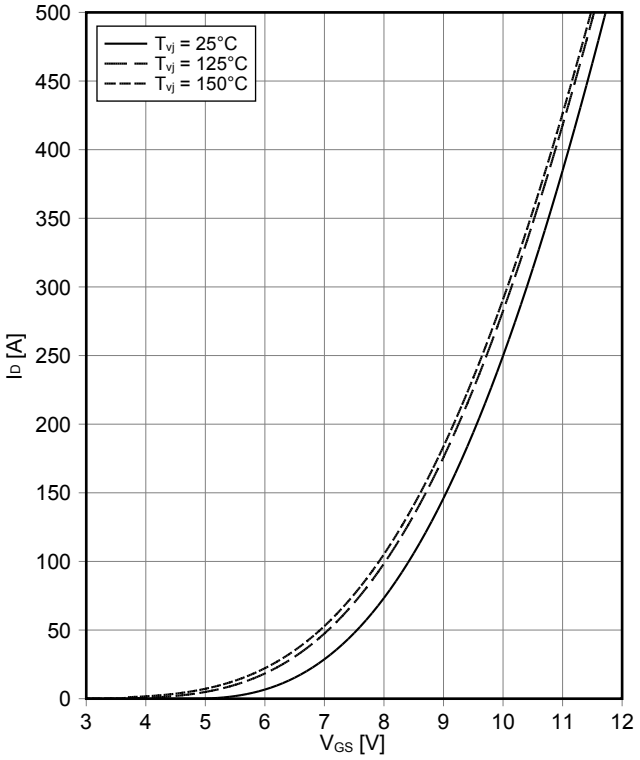
输出特性 MOSFET （典型）
output characteristic MOSFET (typical)
$I_D = f(V_{DS})$
V_{GS} = 15 V



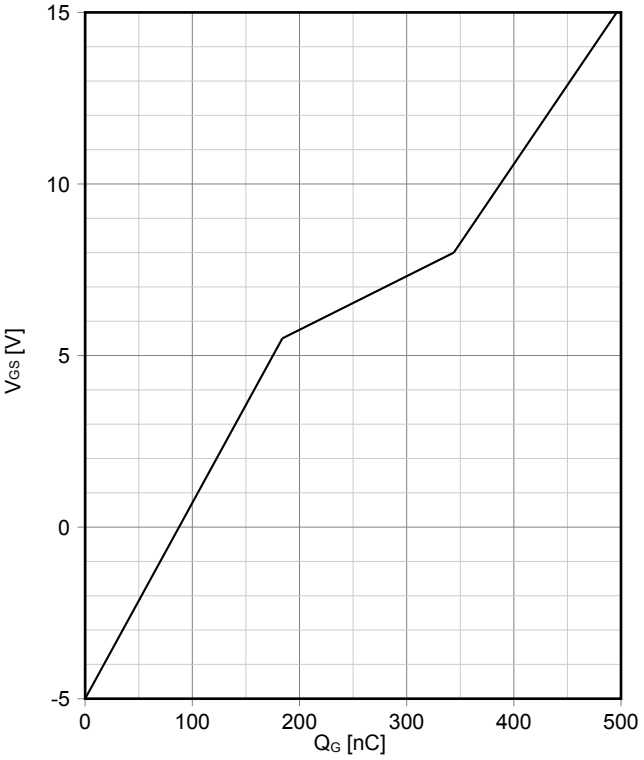
输出特性 MOSFET （典型）
output characteristic MOSFET (typical)
$I_D = f(V_{DS})$
T_{vj} = 150 °C



传输特性 MOSFET （典型）
transfer characteristic MOSFET (typical)
$I_D = f(V_{GS})$
V_{DS} = 20 V

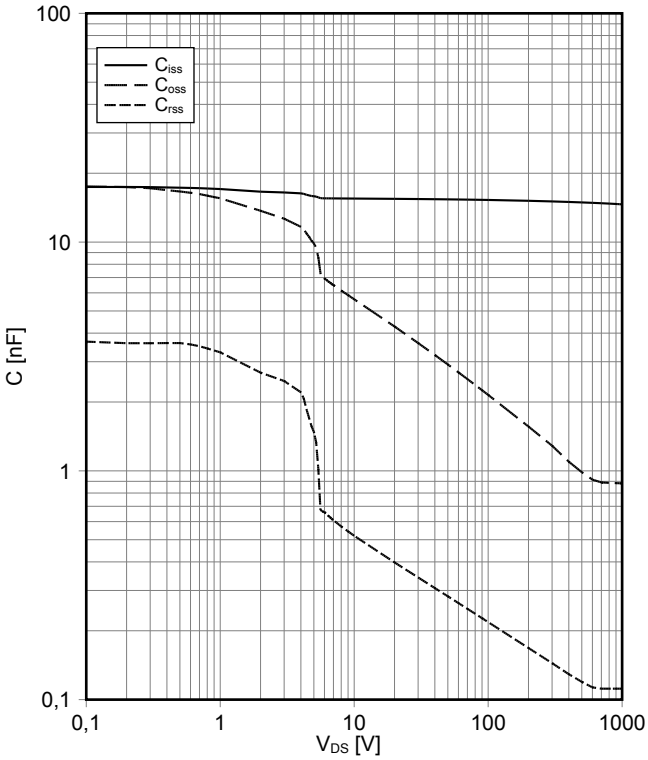


栅极电荷特性 MOSFET (典型)
gate charge characteristic MOSFET (typical)
$V_{GS} = f(Q_G)$
V_{DS} = 800 V, I_D = 250 A, T_{vj} = 25°C

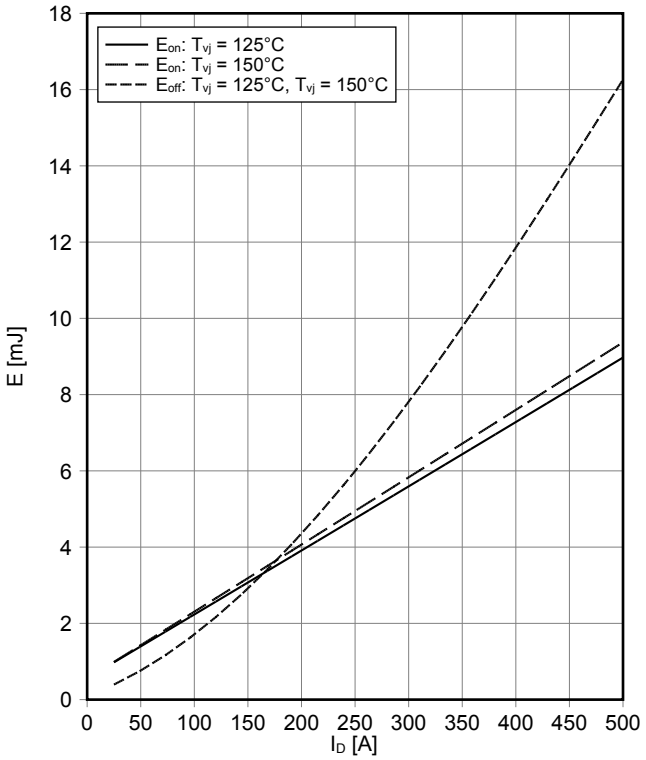


初步数据
Preliminary Data

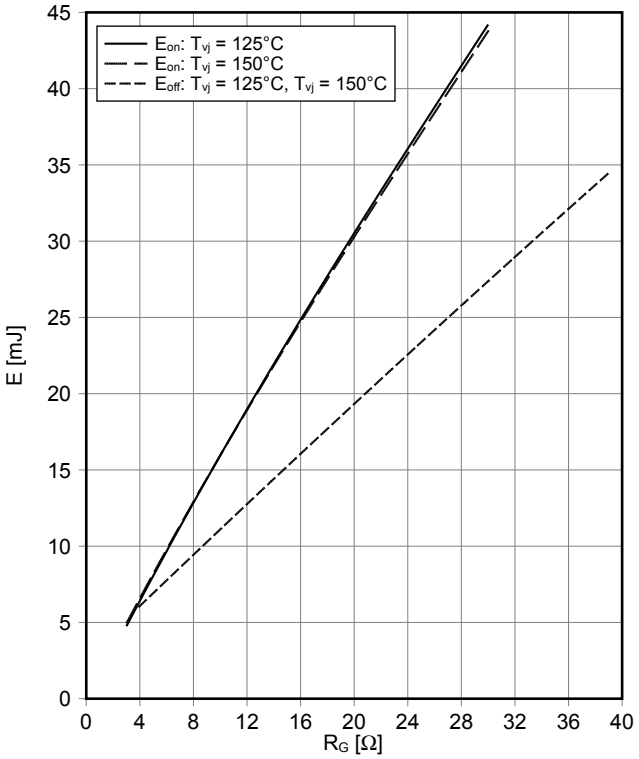
电容特性 MOSFET （典型）
capacity characteristic MOSFET (typical)
C = f (V_{DS})
V_{GS} = 0 V, T_{vj} = 25°C, f = 1 MHz



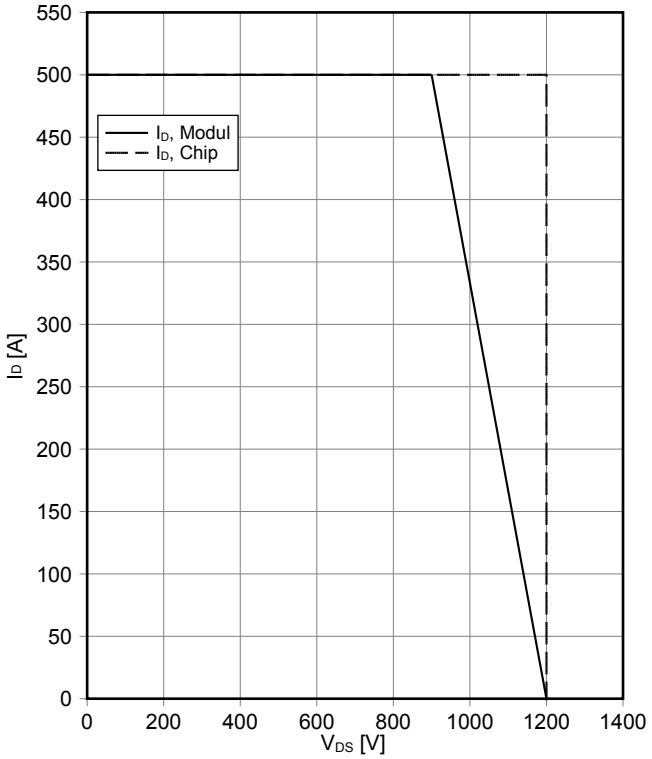
开关损耗 MOSFET （典型）
switching losses MOSFET (typical)
E_{on} = f (I_D), E_{off} = f (I_D)
V_{GS} = -5 V / +15 V, R_{Gon} = 3,0 Ω, R_{Goff} = 3,9 Ω, V_{DS} = 600 V



开关损耗 MOSFET （典型）
switching losses MOSFET (typical)
E_{on} = f (R_G), E_{off} = f (R_G)
V_{GS} = -5 V / +15 V, I_D = 250 A, V_{DS} = 600 V

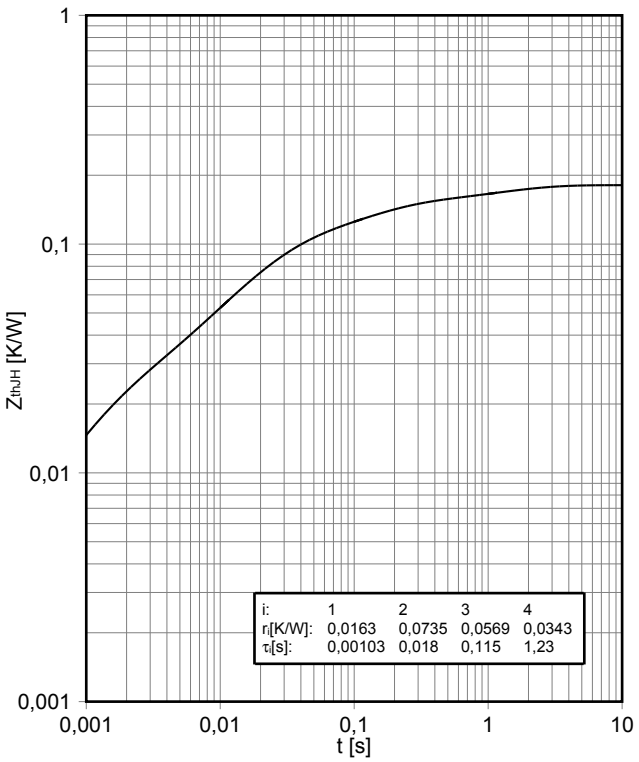


反偏安全工作区 MOSFET (RBSOA)
reverse bias safe operating area MOSFET (RBSOA)
I_D = f (V_{DS})
V_{GS} = -5 V / +15 V, R_{Goff} = 3,9 Ω, T_{vj} = 150°C



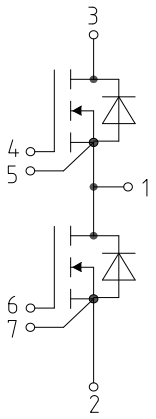
初步数据
Preliminary Data

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

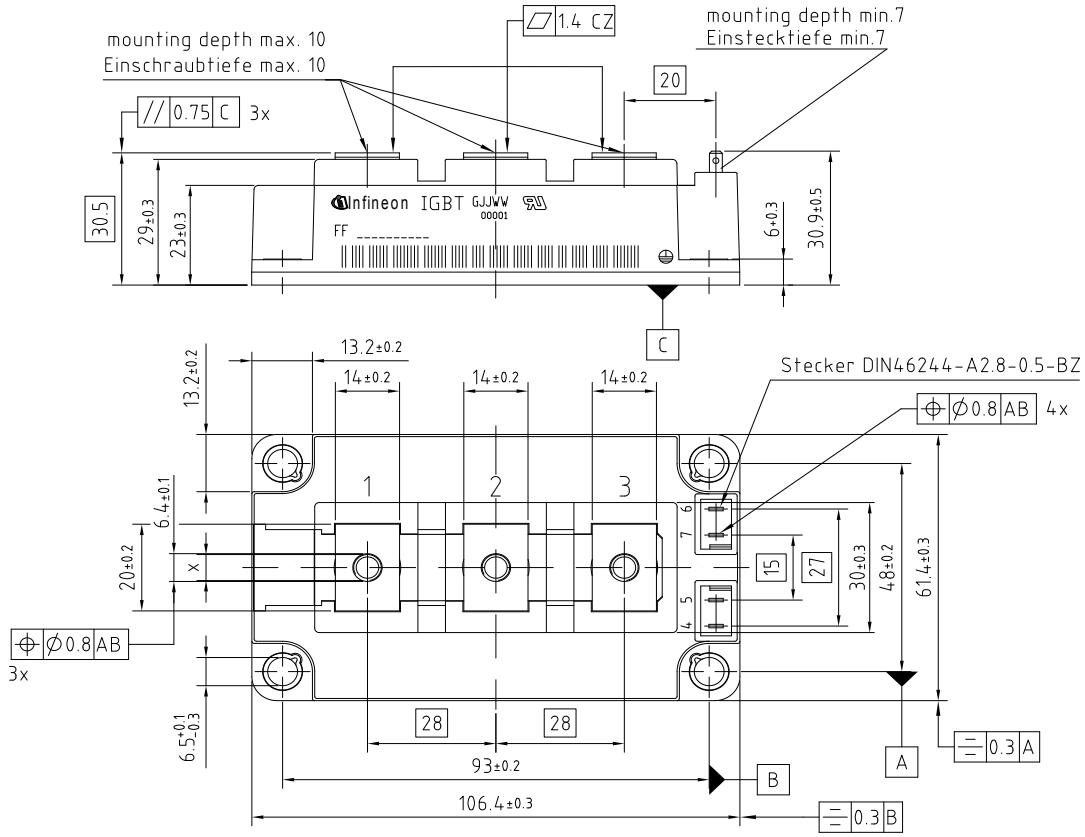


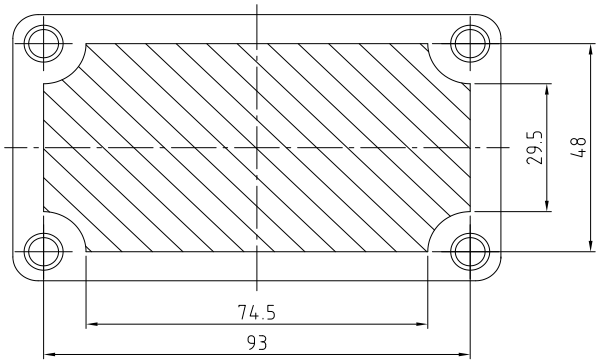
初步数据
Preliminary Data

接线图 / Circuit diagram



封装尺寸 / Package outlines





Sperrfläche für Thermisches Interface Material
restricted area for Thermal Interface Material

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