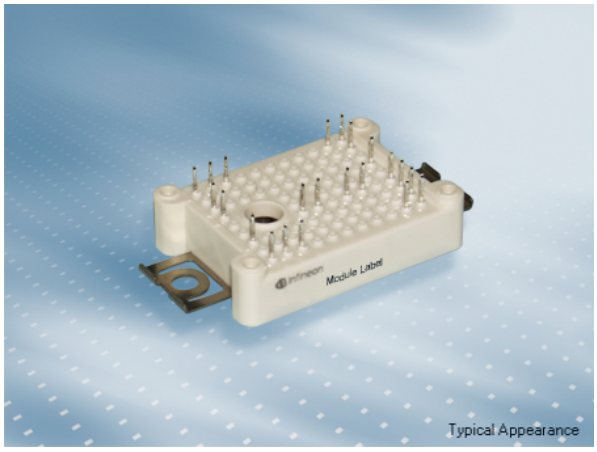
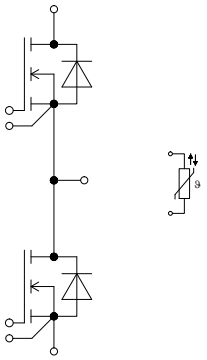
FF11MR12W1M1_B11

EasyDUAL 模块 采用 CoolSiC™ MOSFET 带有pressfit压接管脚和温度检测NTC
EasyDUAL module with CoolSiC™ MOSFET and PressFIT / NTC

初步数据 / Preliminary Data





V_{DSS} = 1200V
$I_{D\ nom}$ = 100A / I_{DRM} = 200A

典型应用
- 高频开关应用
- zh
- 太阳能应用
- UPS系统

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

电气特性
- 高电流密度
- 低电感设计
- 低开关损耗

Electrical Features
- High current density
- Low inductive design
- Low switching losses

机械特性
- 集成NTC温度传感器
- PressFIT 压接技术
- 集成的安装夹使安装坚固

Mechanical Features
- Integrated NTC temperature sensor
- PressFIT contact technology
- Rugged mounting due to integrated mounting clamps

Module Label Code

Barcode Code 128

Sample
00000123456000000000000

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

漏源击穿电压 Drain-source breakdown voltage	T_{vj} = 25°C	V_{DSS}	1200	V
直流漏极电流 DC drain current	T_H = 45°C	$I_{D\ nom}$	100	A
脉冲漏极电流，tp由Tjmax限定 Pulsed drain current, tp limited by Tjmax		$I_{D\ puls}$	200	A
栅源峰值电压 Gate-source peak 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 = 100 A, V_{GS} = -5/15 V, T_{vj} = 25°C	$R_{DS\ on}$		11,0		mΩ
栅极阈值电压 Gate threshold voltage	I_D = 40,0 mA, V_{DS} = V_{GS}, T_{vj} = 25°C (tested after I_{GSS} at V_{GS} = +20V as precondition)	$V_{GS(th)}$	3,50	4,50	5,55	V
栅极电荷 Gate charge	V_{GS} = -5/15 V, V_{DD} = 800 V	Q_G		0,25		µC
内部栅极电阻 Internal gate resistor	T_{vj} = 25°C	R_{Gint}		1,1		Ω
输入电容 Input capacitance	f = 1,00 MHz, T_{vj} = 25°C, V_{DS} = 800 V, V_{GS} = 0 V	C_{iss}		7,95		nF
输出电容 Output capacitance	f = 1,00 MHz, T_{vj} = 25°C, V_{DS} = 800 V, V_{GS} = 0 V	C_{oss}		0,47		nF
反向传输电容 Reverse transfer capacitance	f = 1,00 MHz, T_{vj} = 25°C, V_{DS} = 800 V, V_{GS} = 0 V	C_{rss}		0,052		nF
零栅电压漏极电流 Zero gate voltage drain current	V_{DS} = 1200 V, V_{GS} = 0 V, T_{vj} = 25°C	I_{DSS}			38,0	µA
栅极漏电流 Gate-source leakage current	V_{DS} = 0 V, V_{GS} = 20 V, T_{vj} = 25°C	I_{GSS}			480	nA
开通延迟时间(电感负载) Turn on delay time, inductive load	I_D = 100 A, V_{DS} = 600 V V_{GS} = -5/15 V R_G = 3,90 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$t_{d\ on}$		25,0 21,5 21,5		ns
上升时间(电感负载) Rise time, inductive load	I_D = 100 A, V_{DS} = 600 V V_{GS} = -5/15 V R_G = 3,90 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	t_r		16,5 16,5 16,5		ns
关断延迟时间(电感负载) Turn off delay time, inductive load	I_D = 100 A, V_{DS} = 600 V V_{GS} = -5/15 V R_G = 3,90 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$t_{d\ off}$		64,5 68,0 68,0		ns
下降时间(电感负载) Fall time, inductive load	I_D = 100 A, V_{DS} = 600 V V_{GS} = -5/15 V R_G = 3,90 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	t_f		28,0 31,0 31,0		ns
开通损耗 (每脉冲) Turn-on energy loss per pulse	I_D = 100 A, V_{DS} = 600 V, Lσ = 35 nH V_{GS} = -5/15 V, di/dt = 5200 A/µs (T_{vj} = 150°C) R_G = 3,90 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{on}		1,40 1,45 1,50		mJ
关断损耗 (每脉冲) Turn-off energy loss per pulse	I_D = 100 A, V_{DS} = 600 V, Lσ = 35 nH V_{GS} = -5/15 V, du/dt = 23000 V/µs (T_{vj} = 150°C) R_G = 3,90 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{off}		0,645 0,665 0,665		mJ
短路数据 SC data	V_{GS} = -5/15 V, V_{DD} = 800 V V_{DSmax} = V_{DSS} -L_{sDS} ·di/dt R_G = 10,0 Ω	t_P ≤ 3 µs, T_{vj} ≤ 25°C t_P ≤ 3 µs, T_{vj} ≤ 150°C	I_{SC}		1200 1000		A A
结 - 散热器热阻 Thermal resistance, junction to heatsink	pro MOS-FET / per MOS-FET		R_{thJH}		0,553		K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj\ op}$	-40		150	°C

Revers-Diode / reverse-diode

			min.	typ.	max.	
正向电压 Forward voltage	I_S = 100 A, V_{GS} = -5 V I_S = 100 A, V_{GS} = -5 V I_S = 100 A, V_{GS} = -5 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	V_{SD}		4,00 3,80 3,75	5,65	V

初步数据
Preliminary Data

负温度系数热敏电阻 / NTC-Thermistor

特征值 / Characteristic Values

			min.	typ.	max.	
额定电阻值 Rated resistance	T_{NTC} = 25°C	R_{25}		5,00		kΩ
R100 偏差 Deviation of R100	T_{NTC} = 100°C, R_{100} = 493 Ω	ΔR/R	-5		5	%
耗散功率 Power dissipation	T_{NTC} = 25°C	P_{25}			20,0	mW
B-值 B-value	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298,15\ K))]$	$B_{25/50}$		3375		K
B-值 B-value	$R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298,15\ K))]$	$B_{25/80}$		3411		K
B-值 B-value	$R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298,15\ K))]$	$B_{25/100}$		3433		K

根据应用手册标定
Specification according to the valid application note.

模块 / Module

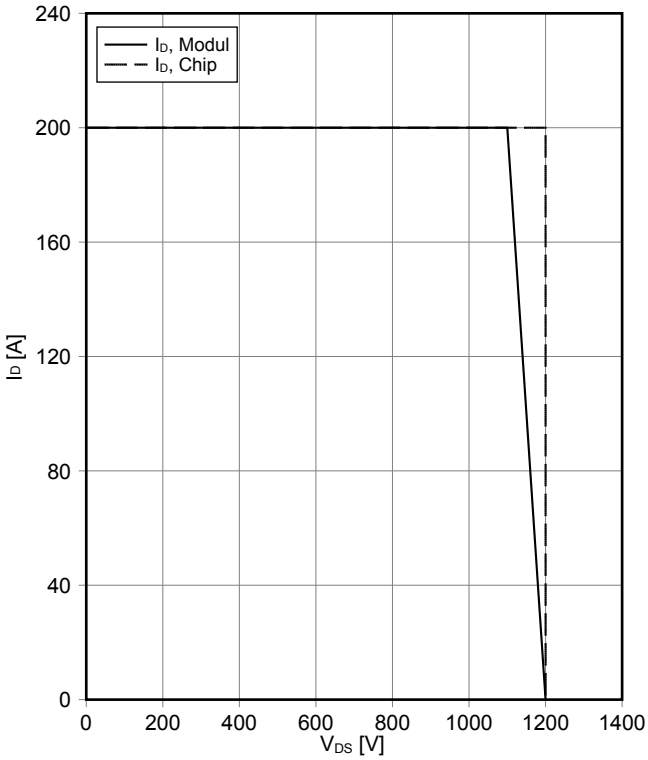
绝缘测试电压 Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V_{ISOL}	3,0		kV
内部绝缘 Internal isolation	基本绝缘 (class 1, IEC 61140) basic insulation (class 1, IEC 61140)		Al_2O_3		
爬电距离 Creepage distance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		11,5 6,3		mm
电气间隙 Clearance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		10,0 5,0		mm
相对电痕指数 Comperative tracking index		CTI	> 200		

			min.	typ.	max.	
杂散电感,模块 Stray inductance module		L_{sCE}		9,0		nH
储存温度 Storage temperature		T_{stg}	-40		125	°C
Anpresskraft für mech. Bef. pro Feder mountig force per clamp		F	20	-	50	N
重量 Weight		G		24		g

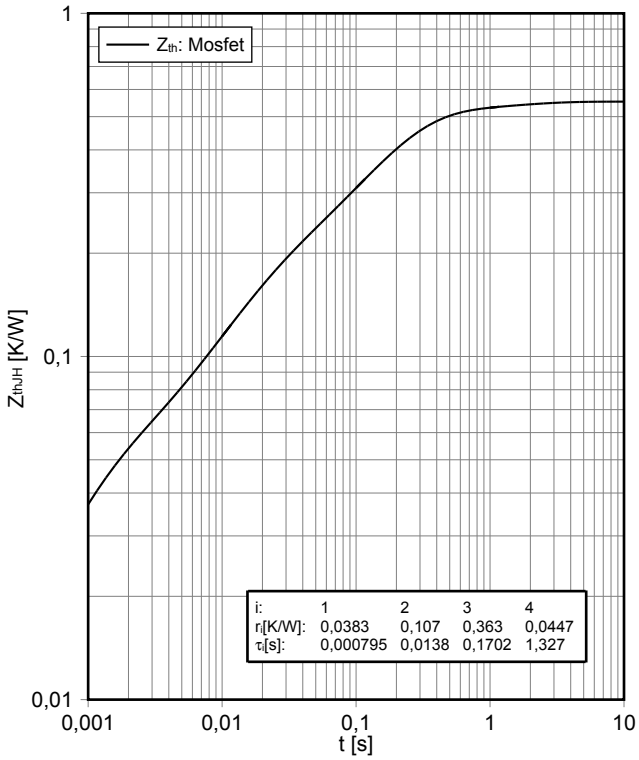
Der Strom im Dauerbetrieb ist auf 25 A effektiv pro Anschlusspin begrenzt.
The current under continuous operation is limited to 25 A rms per connector pin.

初步数据
Preliminary Data

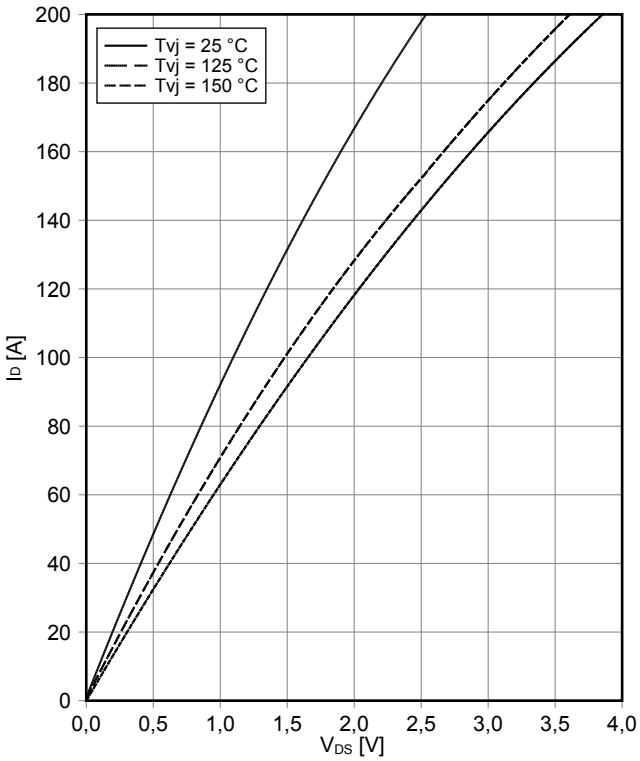
安全工作区 MOSFET (SOA)
safe operating area MOSFET (SOA)
$I_D = f(V_{DS})$
V_{GS} = -5V/+15V, T_{vj} =150°C, R_G=3.9Ω



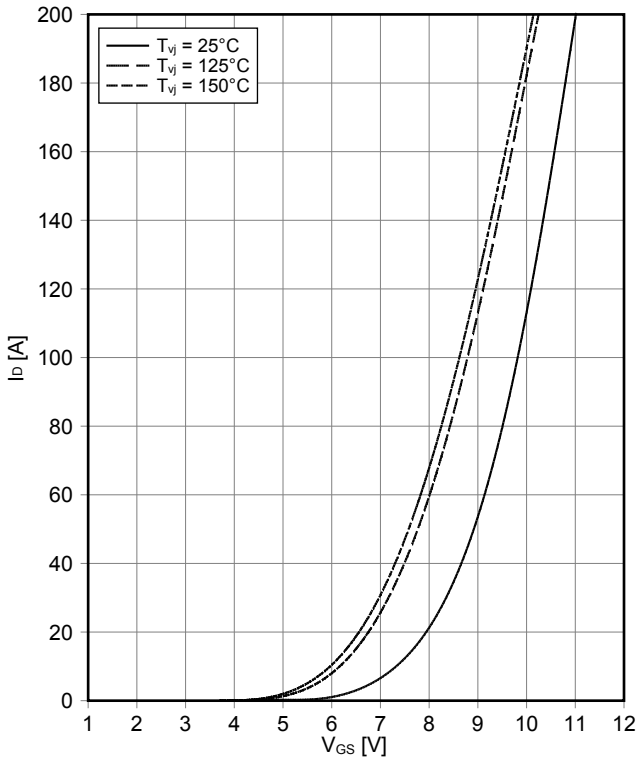
瞬态热阻抗 MOSFET
transient thermal impedance MOSFET
$Z_{thJH} = f(t)$



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

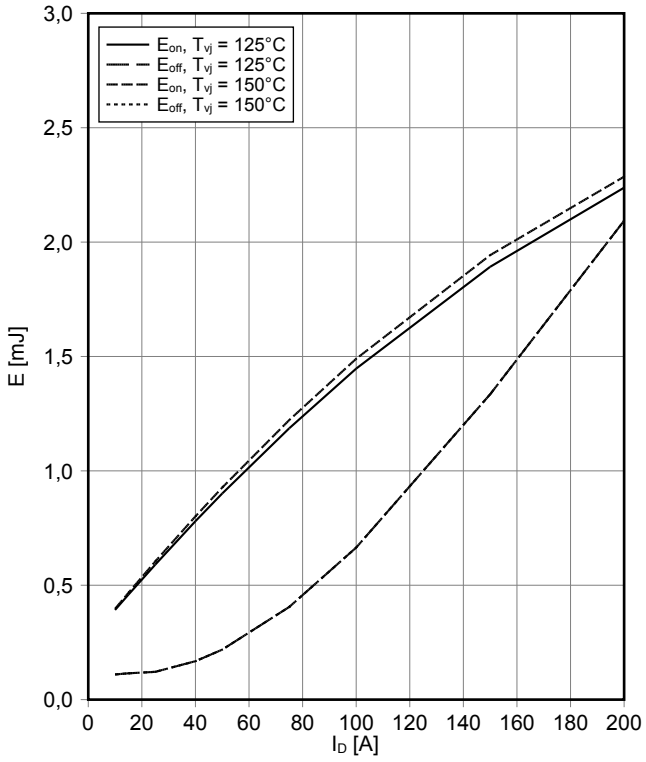


传输特性 MOSFET （典型）
transfer characteristic MOSFET (typical)
$I_D = f(V_{GS})$
V_{DS} = 20 V

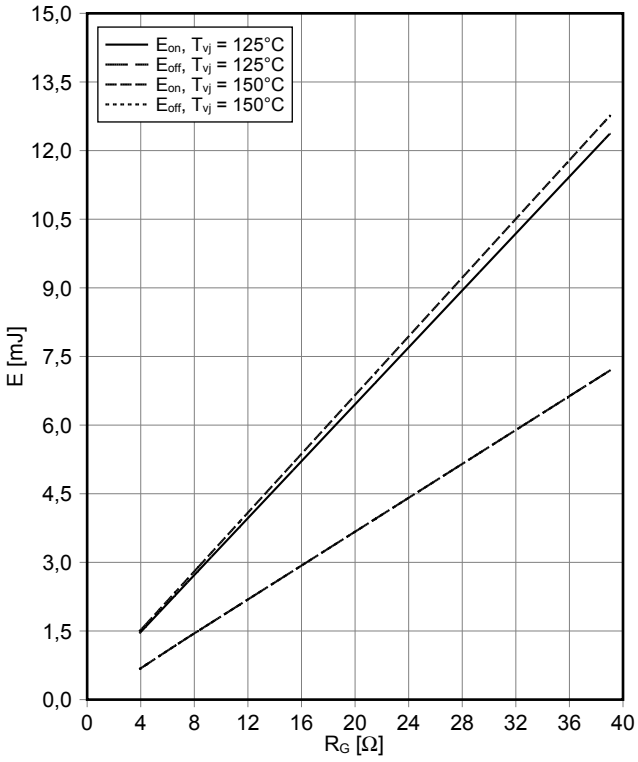


初步数据
Preliminary Data

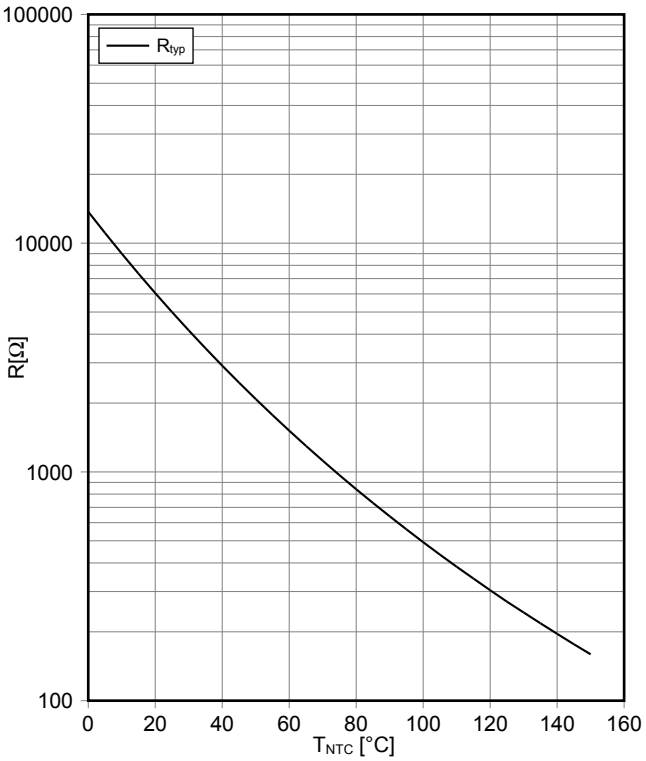
开关损耗 MOSFET （典型）
switching losses MOSFET (typical)
$E_{on} = f(I_D)$, $E_{off} = f(I_D)$
V_{GS} = +15 V / -5 V , R_{Gon} = 3,9 Ω, R_{Goff} = 3,9 Ω, V_{DS} = 600 V



开关损耗 MOSFET （典型）
switching losses MOSFET (typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
V_{GS} = +15 V / -5 V, I_D = 100 A, V_{DS} = 600 V

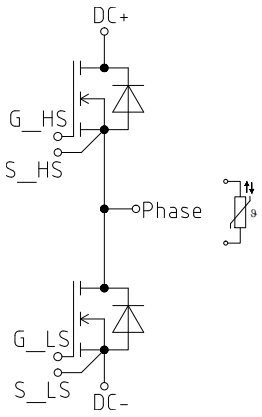


负温度系数热敏电阻 温度特性
NTC-Thermistor-temperature characteristic (typical)
R = f (T)

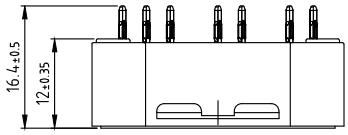


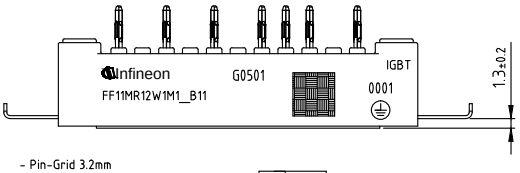
初步数据
Preliminary Data

接线图 / Circuit diagram

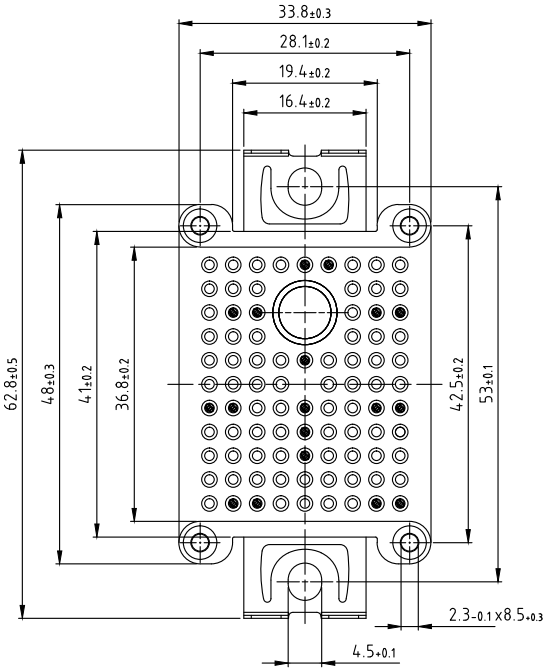


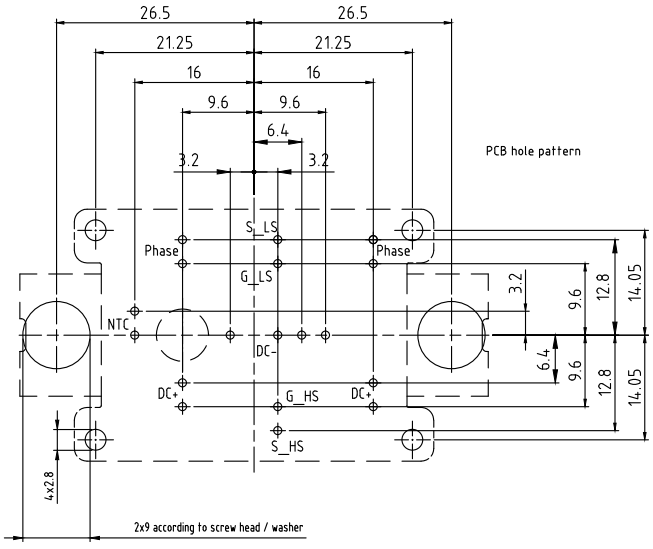
封装尺寸 / Package outlines





- Pin-Grid 3.2mm
- Tolerance of PCB hole pattern ⌖ ⌀0.1
- Hole specification for contacts see AN 2009-01:
  Diameters of drill Ø 1.15mm
  and copper thickness in hole 25-50µm





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