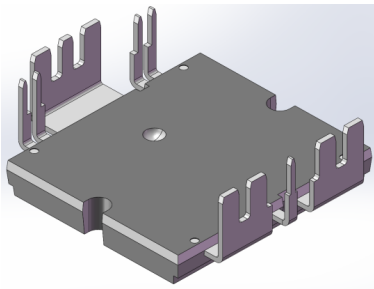
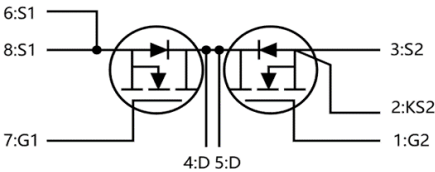


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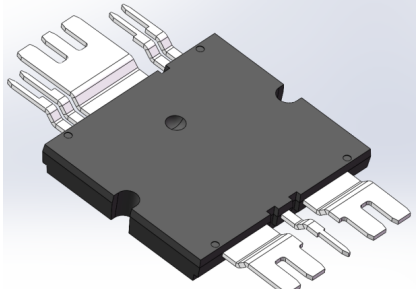


500A对管SDDS型功率模块，
150V-N沟道功率MOSFET器件。

500A pair tube SDDS type module,
150V-N-channel power MOSFET device.



SLC500MD15SLT2



SLC500MD15SLT2 (-S)

$V_{DS}=150V$
 $I_{D\ nom}=435A$
 $R_{SS\ (ON)\ typ}=2.2m\Omega$

特性

- 低导通阻抗
- 高电流密度
- 高可靠性

Features

- Low R_{ss}
- High current density
- High Ruggedness

应用场景

- 电池保护板

Application scenarios

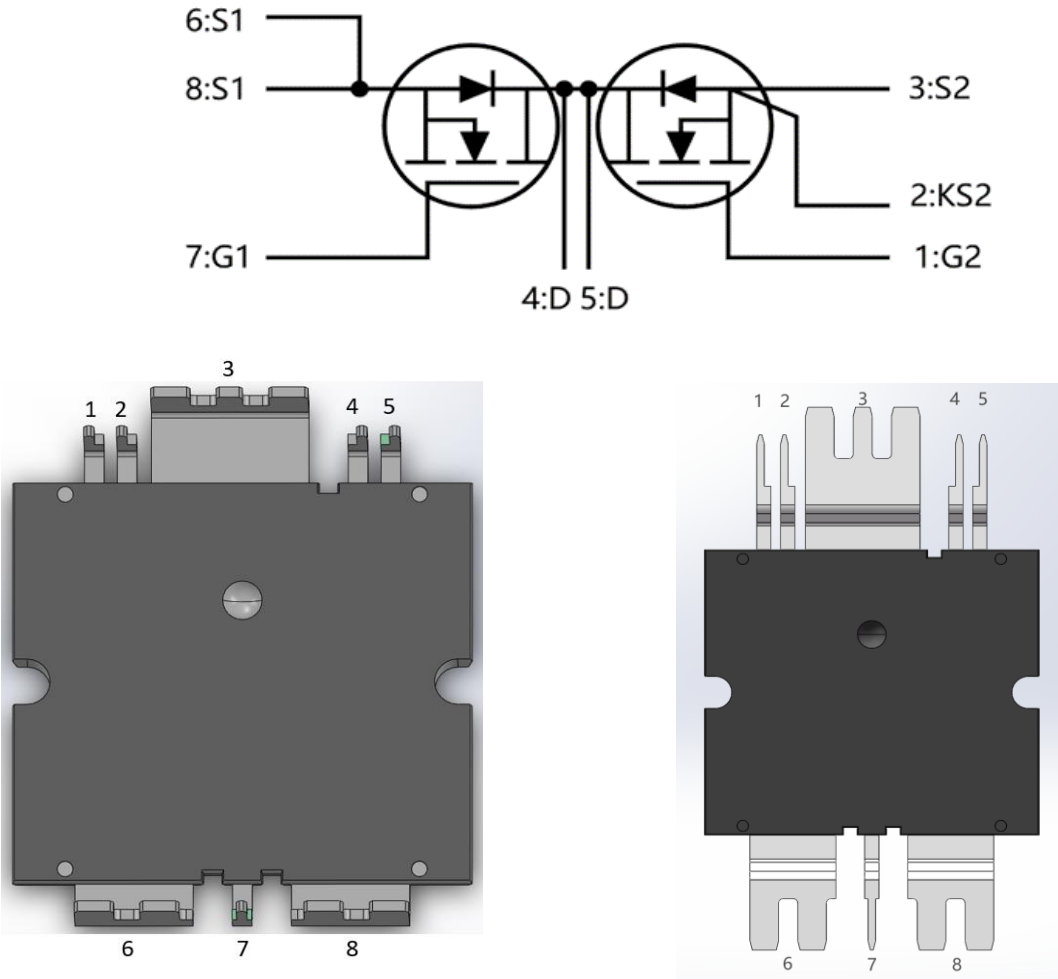
- BMS



Type / Ordering Code	Package	Marking	Related Links
SLC400MD15SLT2 (-S)	T2/T2-S		

Revision	Date	Subjects (major changes since last revision)
V1.0	2024/8/28	New version release

SLC500MD15SLT2(-S)



引脚功能描述/Pin Function Descriptions

Pin No.	Pin Name	Pin Functional Description
1	G2	2号MOSFET 栅极 / NO.2 MOSFET Gate
2	KS2	2号MOSFET 开尔文源极 / NO.2 MOSFET Kelvin Source
3	S2	2号MOSFET 源极 / NO.2 MOSFET Source
4	D	MOSFET 漏极 / MOSFET Drain
5	D	MOSFET 漏极 / MOSFET Drain
6	S1	1号MOSFET 源极 / NO.1 MOSFET Source
7	G1	1号MOSFET 栅极 / NO.1 MOSFET Gate
8	S1	1号MOSFET 源极 / NO.1 MOSFET Source

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最大额定值 / Maximum Rated Values

$T_{vj} = 25^{\circ}\text{C}$, 除非另有说明/ $T_{vj} = 25^{\circ}\text{C}$, Unless Otherwise Specified

Parameter	symbol	Condition	Rating	Unit
漏源极电压 Drain-source voltage	V_{DS}	$V_{GS}=0, I_D=1\text{mA}, T_j=25^{\circ}\text{C}$	150	V
直流漏极电流 DC drain current	$I_{D \text{ nom}}$	$V_{GS}=10\text{V}, T_c=25^{\circ}\text{C}, R_{thJH}=0.1\text{K/W}$	435	A
		$V_{GS}=10\text{V}, T_c=100^{\circ}\text{C}, R_{thJH}=0.1\text{K/W}$	250	
脉冲漏极电流 Pulsed drain current	$I_{D, \text{pulse}}$	tp limited by $T_{vj\text{max}}$	1200	A
雪崩能量, 单脉冲 Avalanche energy, single pulse	E_{AS}	$V_{DD}=100\text{V}, L=0.2\text{mH}, R_g=25\Omega, V_{GS}=10\text{V}$	6.5	J
栅源峰值电压 Gate-source voltage	V_{GS}	-	+20/-20	V
总耗散功率 Power dissipation	P_{tot}	$T_{vj\text{MAX}}=150^{\circ}\text{C}, T_c=25^{\circ}\text{C}, R_{thJH}=0.1\text{K/W}$	1200	W

电气特征值 / Electrical Characteristic Values

$T_{vj} = 25^{\circ}\text{C}$, 除非另有说明/ $T_{vj} = 25^{\circ}\text{C}$, Unless Otherwise Specified

静态特性/Static Characteristic

Parameter	symbol	Condition	Value			Unit
			Min	Typ	Max	
漏源击穿电压 Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0, I_D=1\text{mA}, T_j=25^{\circ}\text{C}$	150	-	-	V
栅极阈值电压 Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS} \quad T_j=25^{\circ}\text{C}$	2.5	2.9	3.2	V
		$I_D=250\mu\text{A} \quad T_j=100^{\circ}\text{C}$	-	2.1	-	
		$T_j=125^{\circ}\text{C}$	-	1.8	-	
零栅电压漏极电流 Zero gate voltage drain current	I_{DSS}	$V_{DS}=100\text{V} \quad T_j=25^{\circ}\text{C}$	-	-	5	μA
		$V_{GS}=0\text{V} \quad T_j=100^{\circ}\text{C}$	-	-	50	
		$T_j=125^{\circ}\text{C}$	-	-	200	
栅极漏电流 Gate-source leakage current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}, T_j=25^{\circ}\text{C}$	-	-	± 100	nA
漏源通态电阻 Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=6\text{V}, I_D=75\text{A}, T_j=25^{\circ}\text{C}$	-	1.3	1.5	m Ω
		$V_{GS}=10\text{V} \quad T_j=25^{\circ}\text{C}$	-	1.1	1.2	
		$I_D=100\text{A} \quad T_j=100^{\circ}\text{C}$	-	1.3	-	
		$T_j=125^{\circ}\text{C}$	-	1.5	-	
内部栅极电阻 Internal gate resistor	R_G	$V_{GS}=0, V_{DS}=0, f=1\text{MHz}$	-	0.76	-	Ω
跨导 Transconductance	g_{fs}	$V_{DS}=40\text{V}, I_D=46\text{A}$	-	276	-	S

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动态特性/Dynamic Characteristic

Parameter	symbol	Condition	Value			Unit
			Min	Typ	Max	
输入电容 Input Capacitance	C_{iss}	$V_{GS}=0$	—	29	—	nF
输出电容 Output capacitance	C_{oss}	$V_{DS}=25V$ $f=0.1MHz$	—	9	—	nF
反向传输电容 Reverse transfer capacitance	C_{rss}	$T_j=25^{\circ}C$	—	0.7	—	nF
开通延迟时间(电感负载) Turn on delay time, inductive load	$t_{d(on)}$	$V_{DS}=80V$ $V_{GS}=18V$ $I_D=50A$ $R_{G, ext}=2\Omega$ $T_j=25^{\circ}C$	—	50	—	ns
上升时间(电感负载) Rise time, inductive load	t_r		—	17	—	
关断延迟时间(电感负载) Turn off delay time, inductive load	$t_{d(off)}$		—	230	—	
下降时间(电感负载) Fall time, inductive load	t_f		—	36	—	
开通损耗(每脉冲) Turn-on energy loss per pulse	E_{on}		—	0.05	—	mJ
关断损耗(每脉冲) Turn-off energy loss per pulse	E_{off}		—	0.08	—	mJ
总的栅极电荷 Total gate charge	Q_g	$V_{DS}=40V, I_D=100A, V_{GS}=10V$	—	370	—	nC
栅源电荷 Gate-Source Charge	Q_{gs}			79		nC
栅漏电荷 Gate-Drain Charge	Q_{gd}		—	113.7	—	nC

体二极管特性/Body Diode Characteristic

Parameter	symbol	Condition	Value			Unit
			Min	Typ	Max	
正向电压 Forward voltage	V_{SD}	$V_{GS}=0, I_S=500A, T_j=25^{\circ}C$	—	1.26	—	V
二极管正向持续电流 Diode continuous forward current	I_S	$T_j=25^{\circ}C$	—	435	—	A
二极管正向脉冲电流 Diode pulse forward current	$I_{S, pulse}$	$T_j=25^{\circ}C$	—	1200	—	A
反向恢复时间 Reverse recovery time	t_{rr}	$V_R=50V$ $I_S=50A$	—	69.7	—	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}	$di/dt=1960A/us$	—	231.7	—	nC

模块特性 / Module Features

Parameter	symbol	Condition	Rating	Unit
结-散热器热阻 Thermal resistance, junction to heatsink	R_{thJH}	Junction to heat dissipation copper plate	0.1	K/W
绝缘测试电压 Isolation test voltage	V_{ISOL}	RMS, f=50Hz, t=0.3s	2.5	kV
重量 Weight	G	-	18	g
模块基板材料 Material of module baseplate			Cu	
内部绝缘 Internal isolation			Al ₂ O ₃	
爬电距离 Creepage distance		端子至散热器 / terminal to heatsink	3.78	mm
		端子至端子 / terminal to terminal	1	
电气间隙 Clearance		端子至散热器 / terminal to heatsink	2.96	mm
		端子至端子 / terminal to terminal	1	
相对电痕指数 Comperative tracking index	CTI		TBD	
模块引线电阻, 端子-芯片 Module lead resistance, terminals - chip	$R_{CC'+EE'}$	TH = 25° C, 每个开关 / per switch	TBD	mΩ
在开关状态下温度 Temperature under switching conditions	$T_{vj\ op}$		-40/150	°C
储存温度 Storage temperature	T_{stg}		-55/150	°C
最高基板工作温度 Maximum baseplate operation temperature	T_{BPmax}		100	°C

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电气特性图/Electrical characteristics diagrams

Figure 1. On-Region Characteristics

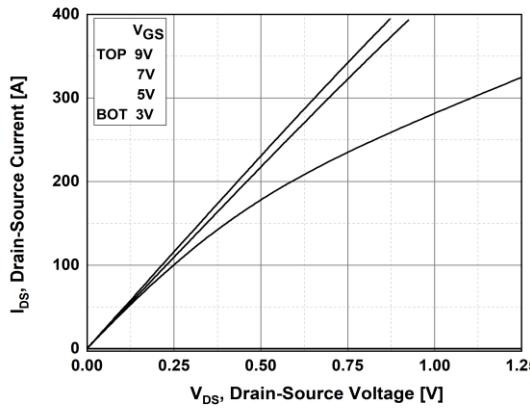


Figure 2. Transfer Characteristics

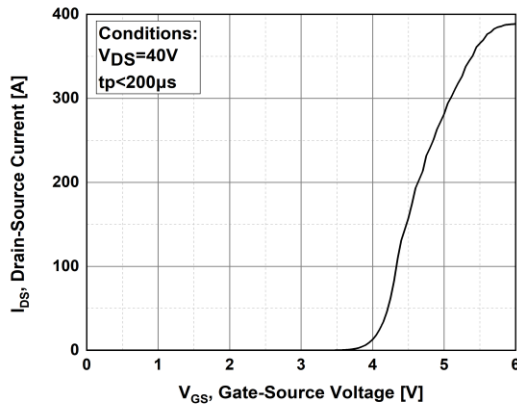


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

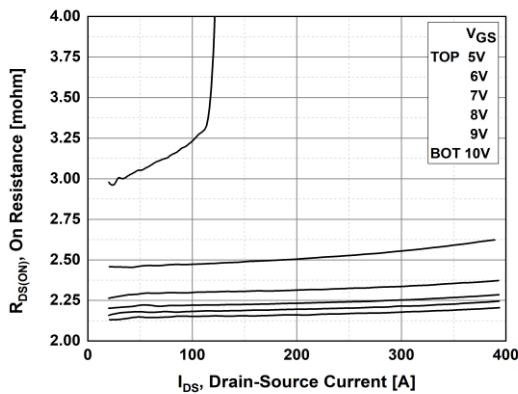


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

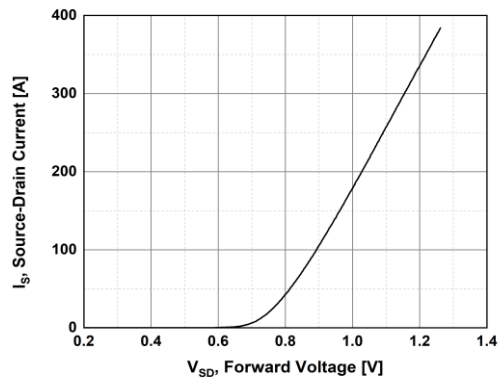


Figure 5. Capacitance Characteristics

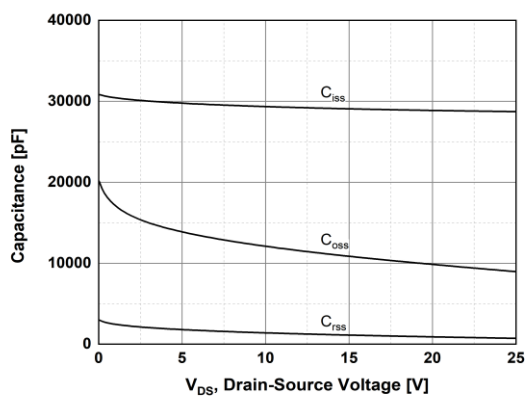
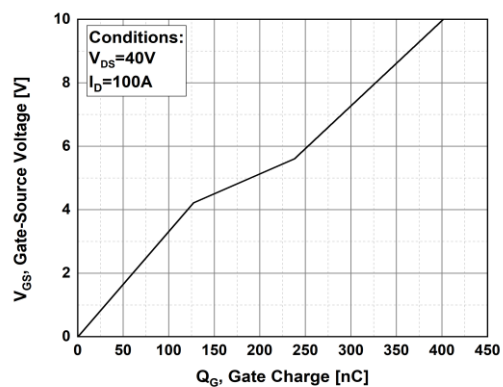


Figure 6. Gate Charge Characteristics



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Figure 7. Breakdown Voltage Variation vs Temperature

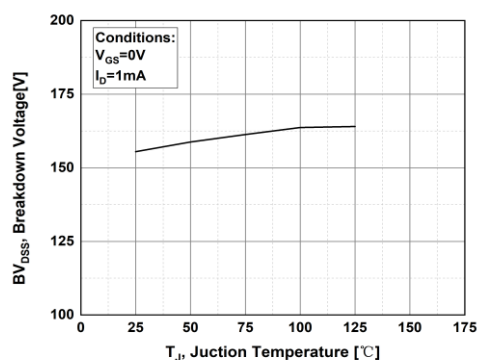


Figure 8. On-Resistance Variation vs Temperature

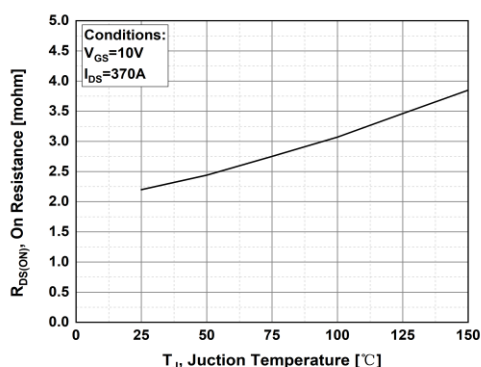


Figure 9. Maximum Drain Current vs Case Temperature

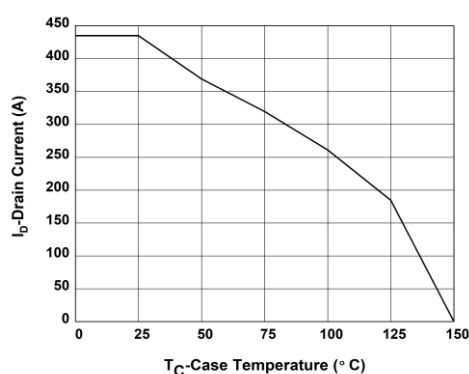


Figure 10. Transient Thermal Response Curve

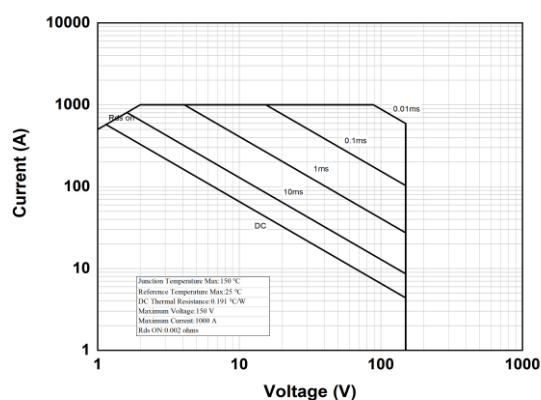
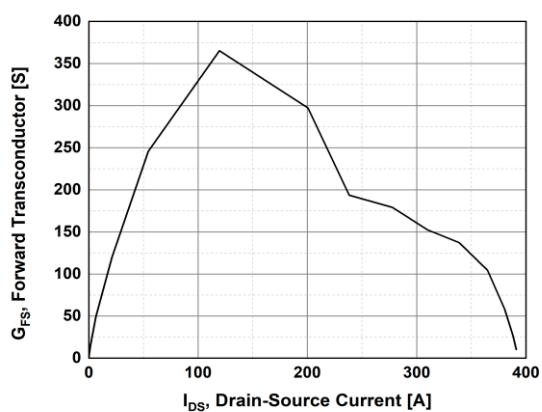


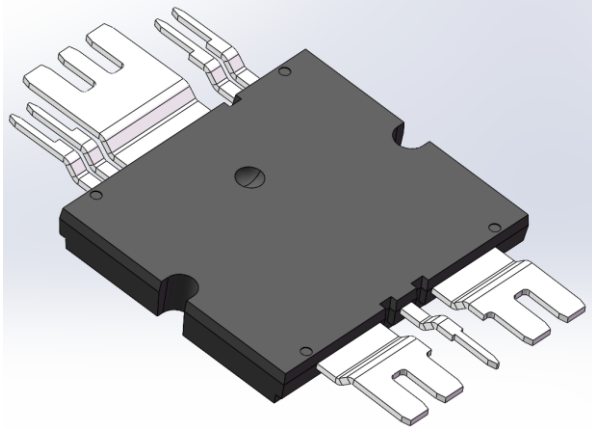
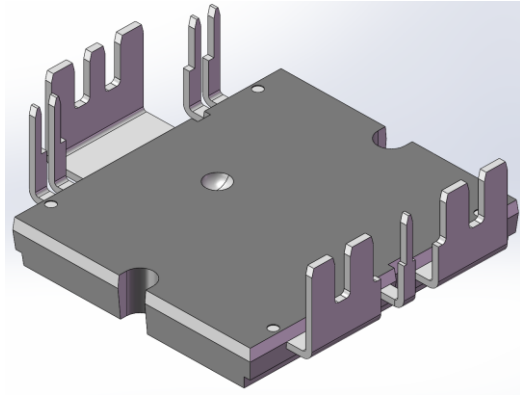
Figure 11. Transconductor Curve



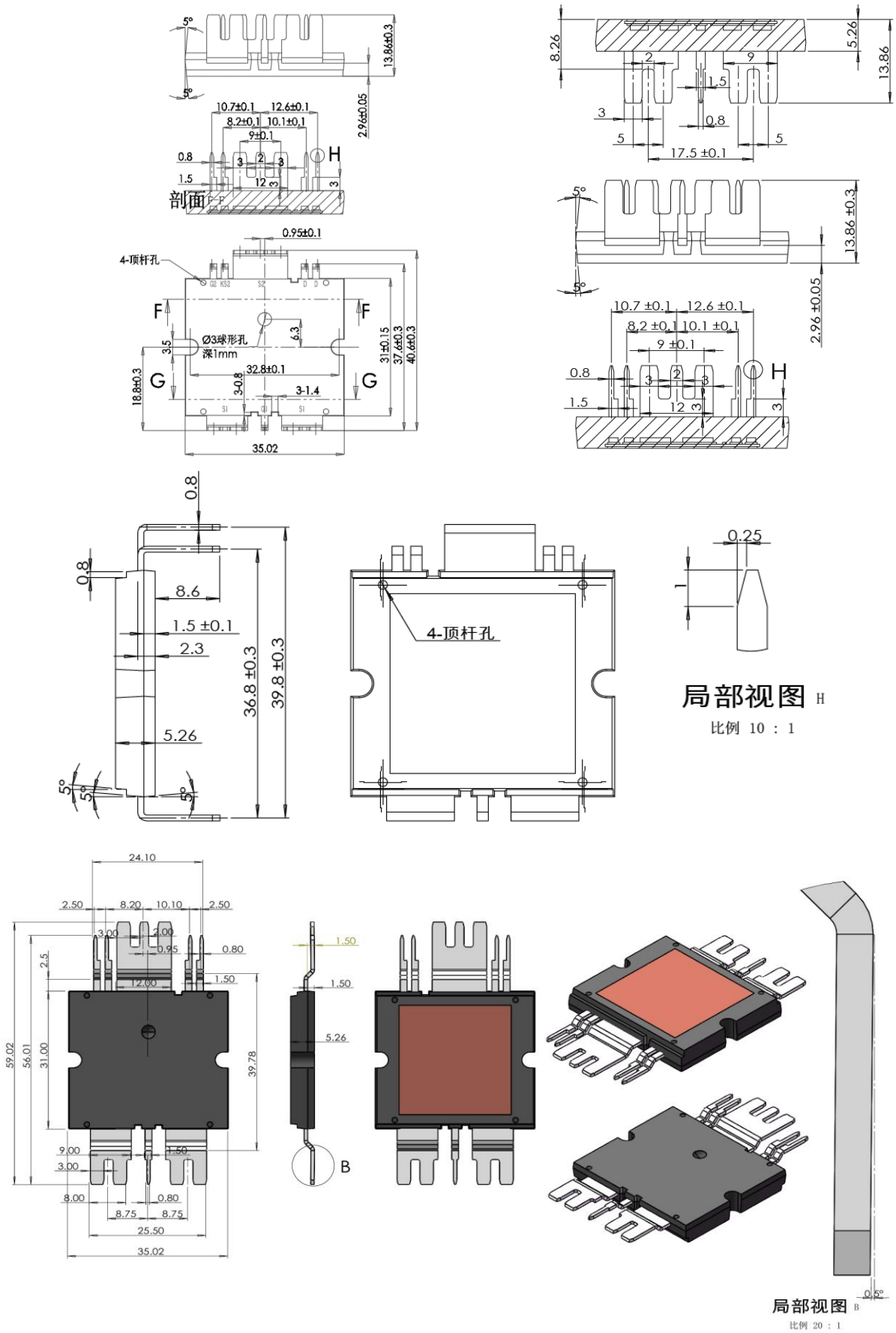
SLC500MD15SLT2(-S)



封装外形 (单位: mm) / Package Outlines (Unit:mm)



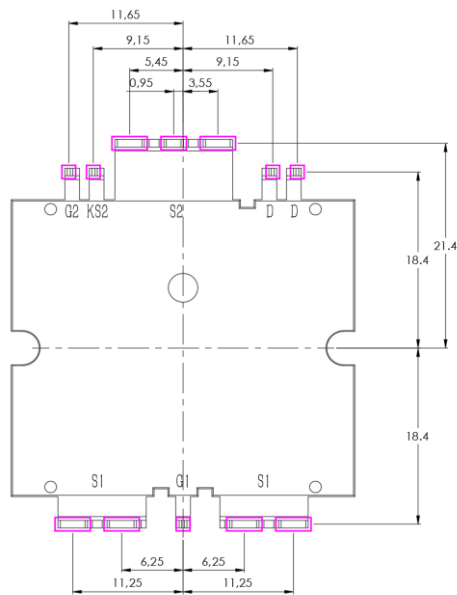
SLC500MD15SLT2 (-S)



SLC500MD15SLT2 (-S)

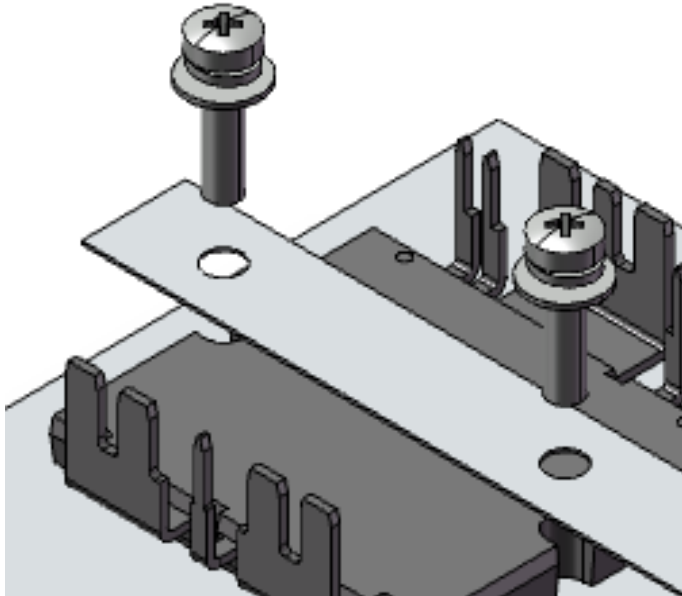


Suggested pad layout



注：所有公差 $\pm 0.3\text{mm}$

Installation advice



- 安装说明:**
- 1、请使用推荐的三合一螺栓，压条推荐用0.3mm的304不锈钢。
 - 2、安装时建议用0.3Nm的扭矩预紧，待导热硅脂充分排出后再用0.5-0.8Nm的扭矩锁紧。