

关键参数

Key Parameters

V_{DS}		1200	V
$R_{DS(on)}$	Typ.	3.0	mΩ
I_D	Max.	660	A
I_{DM}	Max.	1320	A

典型应用

Typical Applications

- | | |
|-------------|----------------------------|
| ● 电动汽车 | Automotive Applications |
| ● 混合动力/纯电动车 | Hybrid/Electrical Vehicles |
| ● 电机驱动 | Motor Drives |

特点

Features

- | | |
|-------------------------------------|--|
| ● 低开关损耗 | Low Switching Losses |
| ● 转模封装 | Molded Package |
| ● 低感设计 | Low Inductive Design |
| ● Si ₃ N ₄ 衬板 | Si ₃ N ₄ AMB Substrate |

电路结构

Circuit Configuration

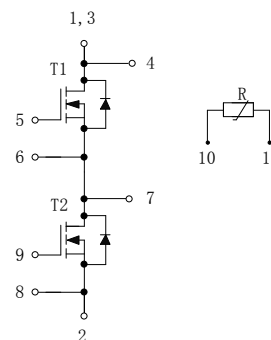


图 1.电路结构

Fig. 1 Circuit configuration

模块外形

Module Appearance



图 2. 模块外形

Fig. 2 Module appearance

模块标签说明

Module Label Code Instruction



数据位置 Data position	数据内容 Content of data
1--8	模块批次号 Module batch number
9--12	模块序列号 Module serial number

最大额定值
Absolute Maximum Ratings

符号 Symbol	参数名称 Parameter	测试条件 Test Conditions	数值 Value	单位 Unit
V_{DS}	漏源极电压 Drain-source voltage	$V_{GS} = 0V, T_C = 25^\circ C$	1200	V
V_{GSS}	栅源峰值电压 Gate-source voltage	$T_C = 25^\circ C$	-5/+18	V
I_D	额定漏极电流 Rating drain current	$T_F = 60^\circ C, T_{vj\max} = 175^\circ C$	660	A
I_{DM}	漏极峰值电流 Peak drain current	$t_P = 1ms$	1320	A
P_{max}	晶体管部分最大损耗 Max. transistor power dissipation	$T_F = 60^\circ C, T_{vj\max} = 175^\circ C$	1385	W
V_{isol}	绝缘电压(模块) Isolation voltage – per module	短接所有端子，端子与基板间施加电压 (Connected terminals to baseplate), RMS,f=0 Hz,t=1 sec , $T_C = 25^\circ C$	4200	V

热和机械数据
Thermal & Mechanical Data

参数 Symbol	说明 Explanation	值 Value	单位 Unit
爬电距离 Creepage distance	端子-散热器 Terminal to heatsink	7.3	mm
	端子-端子 Terminal to terminal	7.3	mm
绝缘间隙 Clearance	端子-散热器 Terminal to heatsink	7.3	mm
	端子-端子 Terminal to terminal	4	mm
相对漏电起痕指数 CTI (Comparative tracking index)		>400	

热和机械数据

Thermal & Mechanical Data

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
$R_{th(J-F)}$ MOSFET	MOSFET 热阻 Thermal resistance –MOSFET	冷却液: 50%乙二醇溶液; $\Delta V/\Delta t=2.67\text{ dm}^3/\text{min}$; $T_F = 65\text{ }^\circ\text{C}$ Cooling Fluid: 50% water / 50% ethylene glycol; $\Delta V/\Delta t=2.67\text{ dm}^3/\text{min}$; $T_F = 65\text{ }^\circ\text{C}$			83	K / kW
ΔP	冷却液流阻 Pressure drop in cooling circuit	冷却液: 50%乙二醇溶液; $\Delta V/\Delta t=2.67\text{ dm}^3/\text{min}$; $T_F = 25\text{ }^\circ\text{C}$ Cooling Fluid: 50% water / 50% ethylenglycol; $\Delta V/\Delta t=2.67\text{ dm}^3/\text{min}$; $T_F = 25\text{ }^\circ\text{C}$		68		mbar
P	冷却液最大压力 Maximum pressure in cooling circuit				2.5	bar
$T_{vj\text{ op}}$	工作结温 Operating junction temperature		-40		175	$^\circ\text{C}$
T_{stg}	存储温度 Storage temperature range		-40		125	$^\circ\text{C}$
M	安装力矩 Screw torque	电路互连用 – M5 Electrical connections – M5	3		6	Nm

热敏电阻数据

PTC-Thermistor Data

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
R	额定电阻值 Rated resistance	$T_C = 0\text{ }^\circ\text{C}$	997.7	1000	1002.3	Ω
		$T_C = 150\text{ }^\circ\text{C}$	1565.4	1573.3	1581.1	Ω
TC_R	温度系数 Temperature coefficient			0.385		%/K
T_{SH}	自发热 Self heating	$T_C = 0\text{ }^\circ\text{C}$ $I_m=0.1\ldots0.3\text{ mA}$		0.4		K/mW

电特性值
Electrical Characteristics

 除非特别声明, 否则 $T_C = 25\text{ }^{\circ}\text{C}$
 $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise stated

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
I_{DSS}	零栅压漏极电流 Zero gate voltage drain current	$V_{GS} = 0V, V_{DS} = V_{DSS}$			100	μA
		$V_{GS} = 0V, V_{DS} = V_{DSS}, T_{vj} = 150\text{ }^{\circ}\text{C}$			500	μA
		$V_{GS} = 0V, V_{DS} = V_{DSS}, T_{vj} = 175\text{ }^{\circ}\text{C}$			1000	μA
I_{GSS}	栅极漏电流 Gate leakage current	$V_{GS} = -5/+18V, V_{DS} = 0V$			500	nA
$V_{GS(th)}$	栅极-源极阈值电压 Gate threshold voltage	$I_D = 100\text{mA}, V_{GS} = V_{DS}$	1.10	2.10	3.10	V
$R_{DS(on)}^{(*1)}$	漏极-源极通态电阻 Drain-source on-state resistance	$V_{GS} = 15V, I_D = 660\text{A}$		3.0		m Ω
		$V_{GS} = 15V, I_D = 660\text{A}, T_{vj} = 150\text{ }^{\circ}\text{C}$		3.9		m Ω
		$V_{GS} = 15V, I_D = 660\text{A}, T_{vj} = 175\text{ }^{\circ}\text{C}$		4.2		m Ω
g_{fs}	跨导 Forward transconductance	$V_{DS} = 20V, I_D = 660\text{A}$		TBD		S
$V_{SD}^{(*1)}$	二极管正向电压 Diode forward voltage	$I_{SD} = 660\text{A}, V_{GS} = 0V$		5.0		V
		$I_{SD} = 660\text{A}, V_{GS} = 0V, T_{vj} = 150\text{ }^{\circ}\text{C}$		4.8		V
		$I_{SD} = 660\text{A}, V_{GS} = 0V, T_{vj} = 175\text{ }^{\circ}\text{C}$		4.8		V
I_{SC}	短路电流 Short circuit current	$T_{vj} = 150\text{ }^{\circ}\text{C}, V_{DD} = 800V,$ $V_{GS} \leq 15V, t_p \leq \text{TBD}\mu\text{s},$ $V_{DS(max)} = V_{DSS} - L^{(*2)} \times di/dt,$ IEC 60747-8		TBD		A

注意: 1. (*1) 表示该参数的测试点为辅助母排端子 (*1) indicates it is measured at the auxiliary busbar terminal),
Note: 2. (*2)表示 L 是电路杂散电感加上 L_{SDS} (*3) indicates L is the circuit stray inductance plus L_{SDS}).

电特性值

Electrical Characteristics

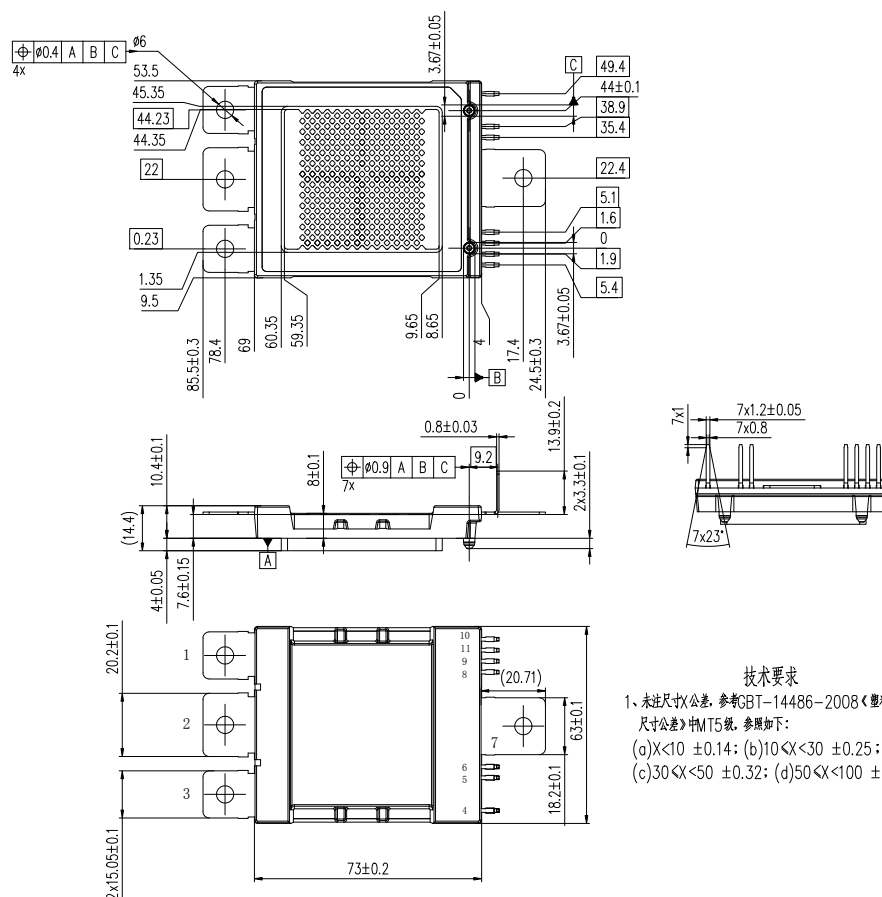
除非特别声明，否则 $T_C = 25\text{ }^{\circ}\text{C}$ $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise stated

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
C_{iss}	输入电容 Input capacitance	$V_{DS} = 600V, V_{GS} = 0V,$ $f = 100kHz$		35		nF
Q_g	栅极电荷 Gate charge	-4/+15V		1.46		μC
C_{rss}	反向传输电容 Reverse transfer capacitance	$V_{DS} = 600V, V_{GS} = 0V, f$ $=100kHz$		0.15		nF
L_{sDS}	模块电感 Module inductance			6		nH
$R_{DD'+SS'}$	模块引线电阻，端子-芯片 Module lead resistance, terminal-chip			0.5		m Ω
R_{Gint}	内部栅极电阻 Internal gate resistor			0.5		Ω

电特性值

Electrical Characteristics

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 =660A, V_{DS} = 800V, V_{GS} = -3/+15V, $R_{G(OFF)}$ =2.6Ω, L_S = 15nH, dv/dt =12000V/μs (T_{vj} = 150 °C).	T_{vj} = 25 °C		380		ns
			T_{vj} = 150 °C		430		
			T_{vj} = 175 °C		435		
t_f	下降时间 Fall time		T_{vj} = 25 °C		80		ns
			T_{vj} = 150 °C		75		
			T_{vj} = 175 °C		75		
E_{OFF}	关断损耗 Turn-off energy loss		T_{vj} = 25 °C		34.0		mJ
			T_{vj} = 150 °C		36.0		
			T_{vj} = 175 °C		36.5		
$t_{d(on)}$	开通延迟时间 Turn-on delay time	T_{vj} = 25 °C		150		ns	
		T_{vj} = 150 °C		130			
		T_{vj} = 175 °C		130			
t_r	上升时间 Rise time	T_{vj} = 25 °C		125		ns	
		T_{vj} = 150 °C		115			
		T_{vj} = 175 °C		110			
E_{ON}	开通损耗 Turn-on energy loss	T_{vj} = 25 °C		24.0		mJ	
		T_{vj} = 150 °C		22.0			
		T_{vj} = 175 °C		21.5			
Q_{rr}	二极管反向恢复电荷 Diode reverse recovery charge	T_{vj} = 25 °C		5		μC	
		T_{vj} = 150 °C		8			
		T_{vj} = 175 °C		10			
I_{rr}	二极管反向恢复电流 Diode reverse recovery current	T_{vj} = 25 °C		170		A	
		T_{vj} = 150 °C		280			
		T_{vj} = 175 °C		300			
E_{rec}	二极管反向恢复损耗 Diode reverse recovery energy	T_{vj} = 25 °C		1.3		mJ	
		T_{vj} = 150 °C		3.2			
		T_{vj} = 175 °C		3.6			



重量 Weight: 215 g 模块外观类型 Module outline code: L5

图 3. 模块外观尺寸

Fig. 3 Module outlines

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