ShiLing® 浙江世菱电力电子有限公司
ZHEJIANG SHILING POWER ELECTRON CO.,LTD.

产品规格书

Specification of Products

产品名称：MOSFET模块

产品型号：50A650V

浙江世菱电力电子有限公司
ZHEJIANG SHILING POWER ELECTRON CO.,LTD.

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版本号：03 更新日期：2016.3.6

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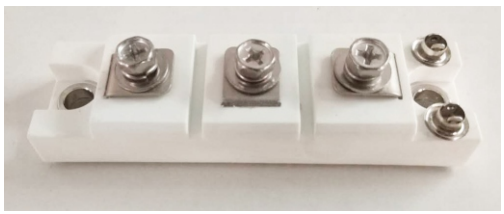
SEMICONDUCTOR

MOSFET

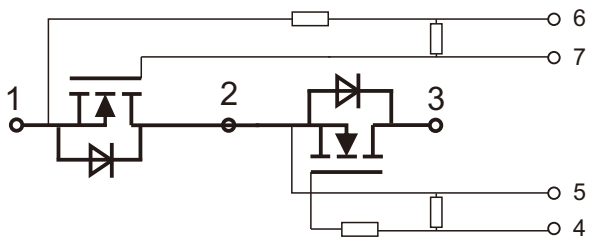
Molding Type Module

650V/50A 2 in one-package



General Description

SHILINGPOWER MOSFET Power Module provides very low $R_{DS(on)}$ as well as optimized intrinsic diode. It s designed for the applications such SMPS and DC drives.



Equivalent Circuit Schematic

Features

- Low $R_{DS(on)}$
- Optimized intrinsic reverse diode
- Low inductance case avoid oscillations
- Kelvin source terminals for easy drive
- Isolated copper baseplate using DBC technology

Typical Applications

- Main and auxiliary AC drives of electric vehicles
- DC servo and robot drives
- Battery vehicles
- UPS equipment
- Plasma cutting

Absolute Maximum Ratings T_C=25℃ unless otherwise noted

Symbol	Description		Units
V_{DSS}	Drain-Source Voltage	650	V
V_{GSS}	Gate-Source Voltage	±30	V
I_D	Drain Current @ T_C=25℃ @ T_C=80℃	50 35	A
I_F	Diode Forward Current	50	A
P_D	Maximum Power Dissipation @ T_j=175℃	450	W
T_{jmax}	Maximum Junction Temperature	150	℃
T_{jop}	Operating Junction Temperature	- 40 to +150	℃
T_{STG}	Storage Temperature Range	- 40 to +125	℃
V_{ISO}	Isolation Voltage RMS,f=50Hz,t=1min	3000	V
Mounting Torque	Power Terminal Screw:M5 Mounting Screw:M6	3.5to 4.0 3.0 to 5.0	N.m

Electrical Characteristics of MOSFET T_C=25℃ unless otherwise noted

Off Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	T_j=25℃	650			V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=V_{DSS},V_{GS}=0V, T_j=25℃			1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=V_{GSS},V_{DS}=0V, T_j=25℃			±100	nA

On Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{GS(th)}$	Gate-Source Threshold Voltage	I_D=1.0mA,V_{DS}=V_{GS}, T_j=25℃	3.2		4.2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	I_D=50 A,V_{GS}=10V, T_j=25℃		63	80	mΩ
g_{fs}	Forward Transconductance	V_{DS}=50V,I_D=50 A	208			S

Switching Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
R_{Gint}	Internal Gate Resistance			0.68		Ω
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=600V,I_D= 50 A, R_G= 0.26Ω,V_{GS}=10V, T_j=25℃		25		ns
t_r	Rise Time			27		ns
$t_{d(off)}$	Turn-Off Delay Time			70		ns
t_f	Fall Time			16		ns
Q_g	Total Gate Charge	I_D=50 A,V_{DS}=600V, V_{GS}=10V		197		nC
Q_{gs}	Gate-Source Charge			70		nC
Q_{gd}	Gate-Drain ("Miller") Charge			64		nC
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=25V, f=1.0MHz		12.7		nF
C_{oss}	Output Capacitance			1.28		nF
C_{rss}	Reverse Transfer Capacitance			0.12		nF
L_{CE}	Stray Inductance				20	nH
R_{CC+EE}	Module Lead Resistance,Terminal to Chip	T_C=25℃		0.35		mΩ

Electrical Characteristics of Inverse Diode T_C=25℃ unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Diode Forward Voltage	I_F= 100A,V_{GS}=0V,T_j=25℃	0.5		1.0	V
t_{rr}	Diode Reverse Recovery Time	V_R=300V,I_F=100A, di/dt=100A/μs, T_j=25℃		200		ns
Q_{rr}	Diode Reverse Recovery Charge			0.6		μC

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case (per MOSFET)		0.189	K/W
$R_{\theta CS}$	Case-to-Sink (Conductive grease applied)	0.035		K/W
Weight	Weight of Module	110		g

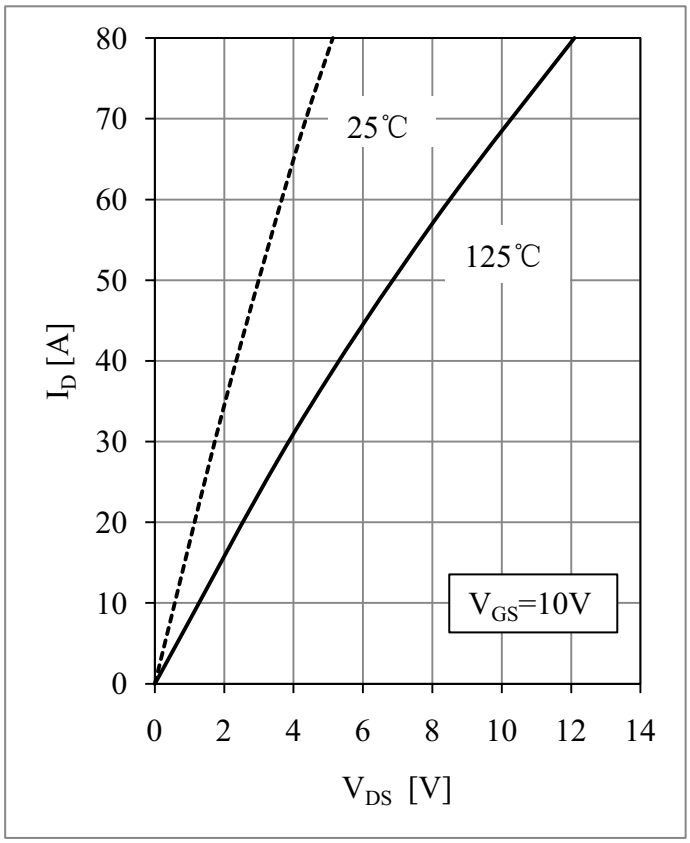


Fig 1. Mosfet Output Characteristics

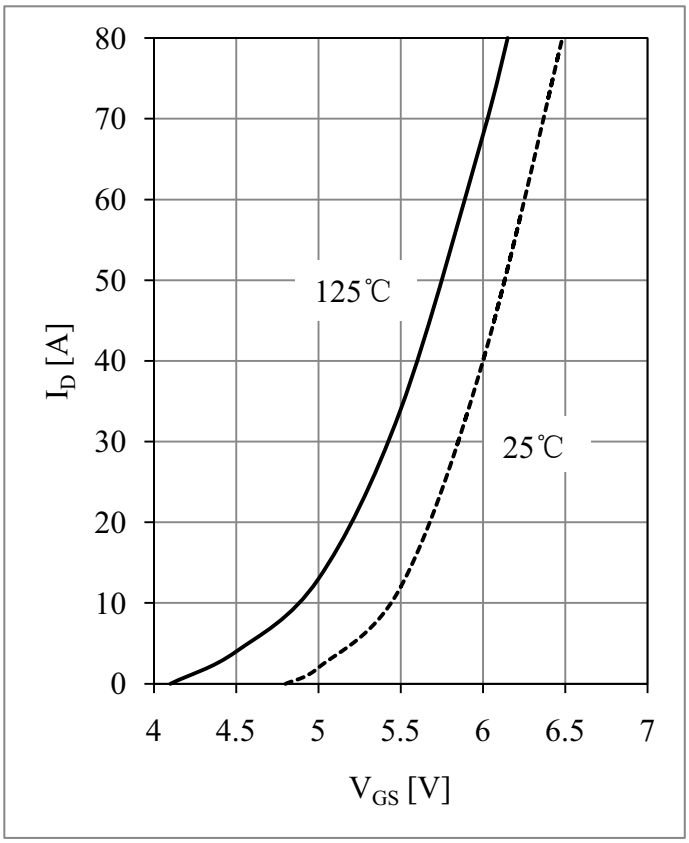


Fig 2. Mosfet Transfer Characteristics

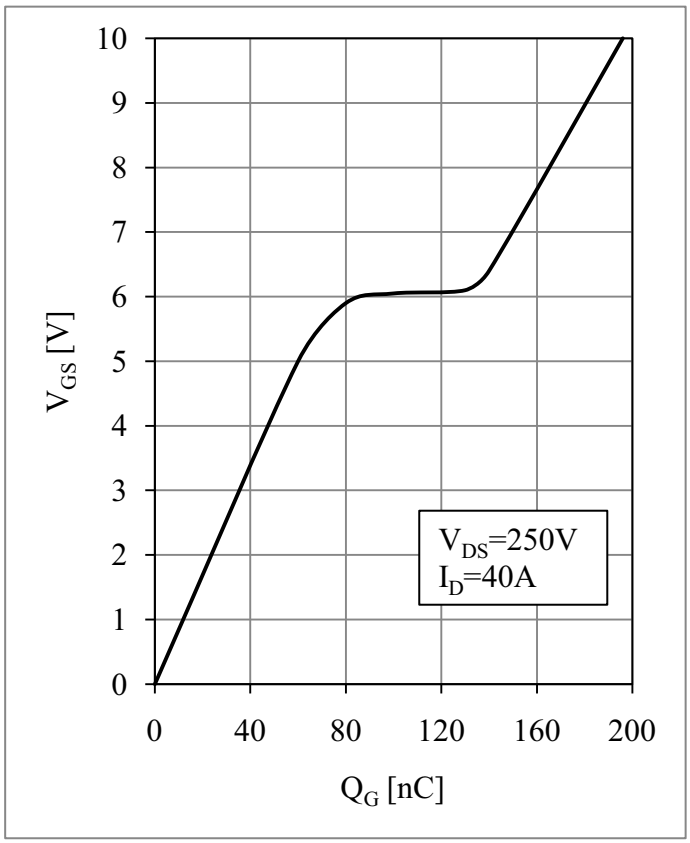


Fig 3. Gate Charge Characteristic

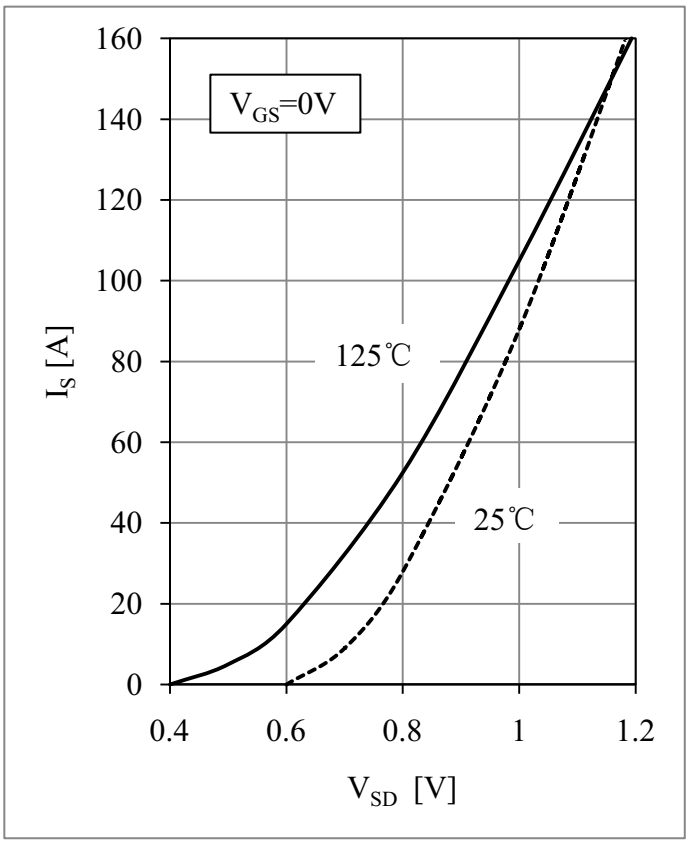


Fig 4. Inverse Diode Output Characteristics

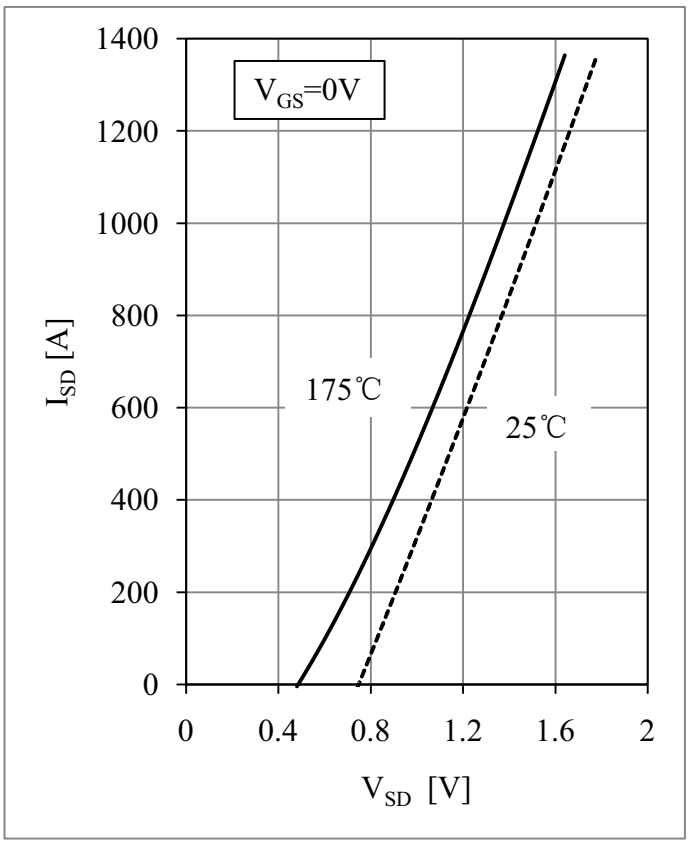


Fig 5. Inverse Diode Output Characteristic

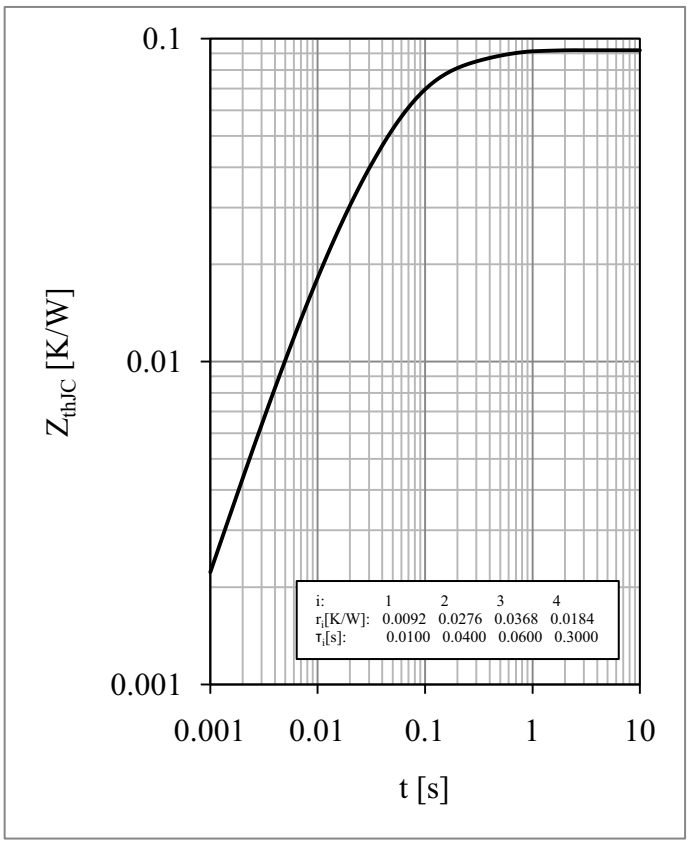
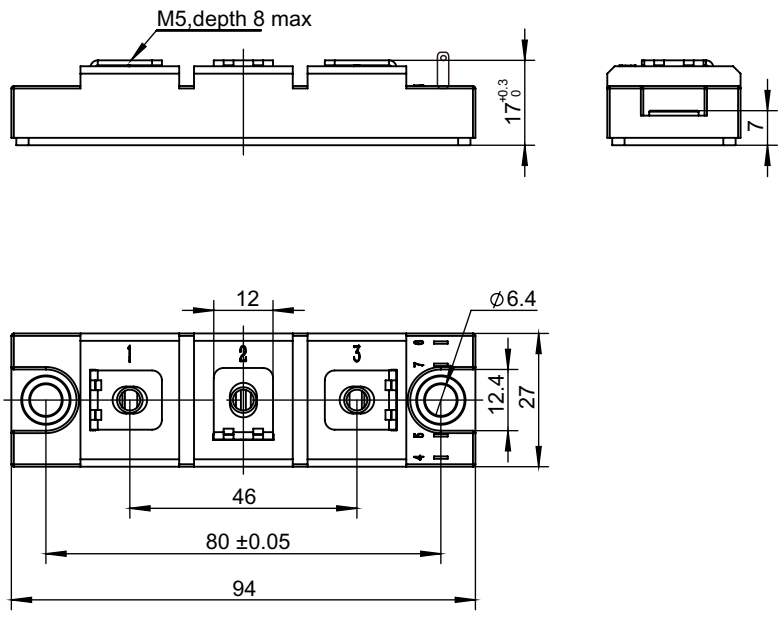


Fig 6. Transient Thermal Impedance

Package Dimension



Dimensions (mm)