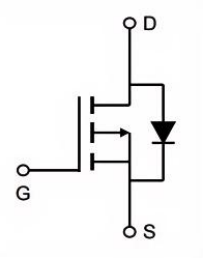
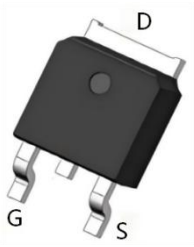
P-Channel Enhancement Mode MOSFET

Parameter	Value	Unit
V_{DS}	-60	V
$R_{DS(on)}$	70	mΩ
I_D	-15	A





TO-252

Features

- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Applications

- DC-DC Converters
- Power Switch

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1]	T_C=25℃	I_D	-15	A
Continuous Drain Current [1]	T_C=100℃	I_D	-8.3	A
Continuous Drain Current [1]	T_A=25℃	I_D	-3.3	A
Continuous Drain Current [1]	T_A=70℃	I_D	-2.7	A
Pulsed Drain Current [2]		I_{DM}	-26	A
Single Pulse Avalanche Energy [3]		E_{AS}	29.8	mJ
Avalanche Current		I_{AS}	-24.4	A
Total Power Dissipation [4]	T_C=25℃	P_D	31.3	W
Total Power Dissipation [4]	T_A=25℃	P_D	2	W
Storage Temperature Range		T_{STG}	-55 to 150	℃
Operating Junction Temperature Range		T_J	-55 to 150	℃

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-ambient [1]	$R_{\theta JA}$	--	62	℃/W
Thermal Resistance Junction-Case [1]	$R_{\theta JC}$	--	4	℃/W

Electrical Characteristics(T_J=25℃,unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=-250uA	-60	--	--	V
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-10A	--	70	90	mΩ
		V_{GS}=-4.5V , I_D=-5A	--	85	115	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D=-250uA	-1.0	--	-2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-48V,V_{GS}=0V,T_J=25℃	--	--	-1	uA
		V_{DS}=-48V,V_{GS}=0V,T_J=55℃	--	--	-5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}= ±20V,V_{DS}=0V	--	--	±100	nA
Forward Transconductance	g_{fs}	V_{DS}=-5V , I_D=-4A	--	8.7	--	S
Gate Resistance	R_g	V_{DS}=0V, V_{GS}=0V, f=1MHz	--	15	--	Ω
Total Gate Charge(-4.5V)	Q_g	V_{DS}=-12V, V_{GS}=-4.5V I_D=-6A	--	11.8	--	nC
Gate-Source Charge	Q_{gs}		--	1.9	--	
Gate-Drain Charge	Q_{gd}		--	6.5	--	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-15V , V_{GS}=-10V R_G=3.3Ω ,I_D=-1A	--	8.8	--	ns
Rise Time	T_r		--	19.6	--	
Turn-Off Delay Time	$T_{d(off)}$		--	47.2	--	
Fall Time	T_f		--	9.6	--	
Input Capacitance	C_{iss}	V_{DS}=-20V , V_{GS}=0V f=1MHz	--	1080	--	pF
Output Capacitance	C_{oss}		--	73	--	
Reverse Transfer Capacitance	C_{rss}		--	50	--	

Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current [1,5]	I_S	V_G=V_D=0V , Force Current	--	--	-15	A
Pulsed Source Current [2,5]	I_{SM}		--	--	-26	A
Diode Forward Voltage [2]	V_{SD}	V_{GS}=0V , I_S=-1A , T_J=25℃	--	--	-1.0	V

Note :

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH,I_{AS}=-24.4A

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

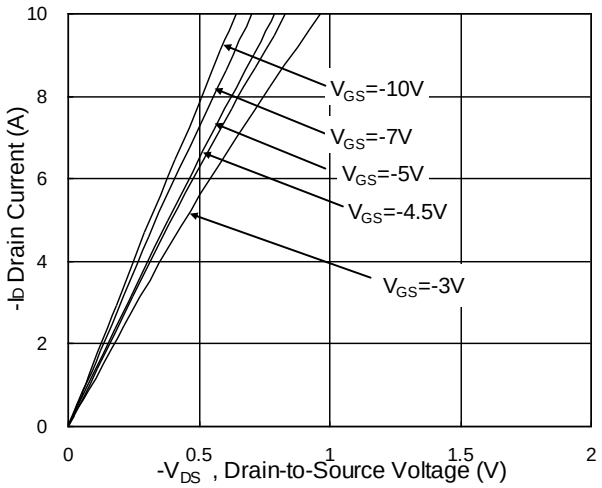


Fig.1 Typical Output Characteristics

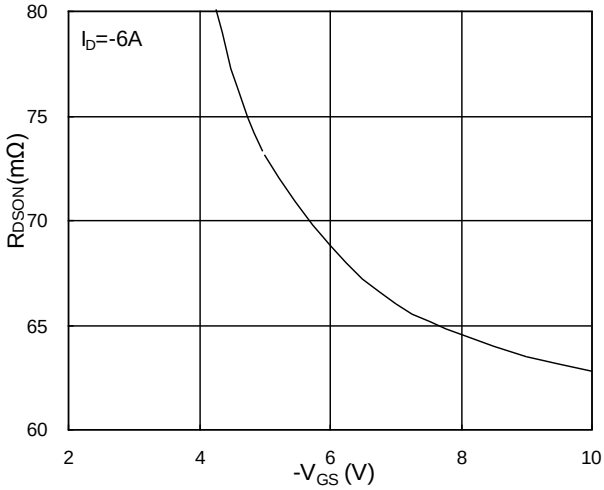


Fig.2 On-Resistance v.s Gate-Source

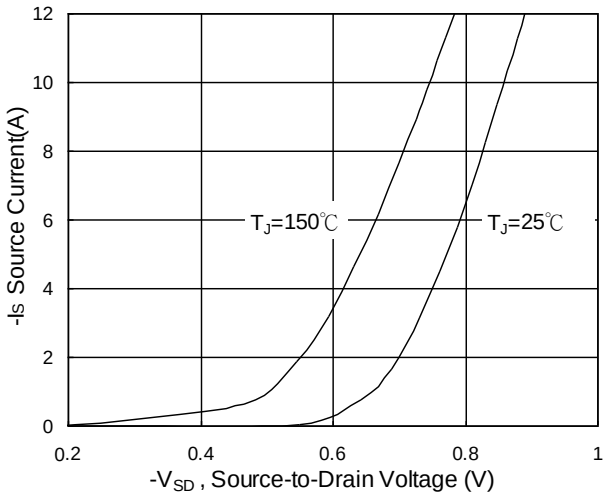


Fig.3 Forward Characteristics of Reverse

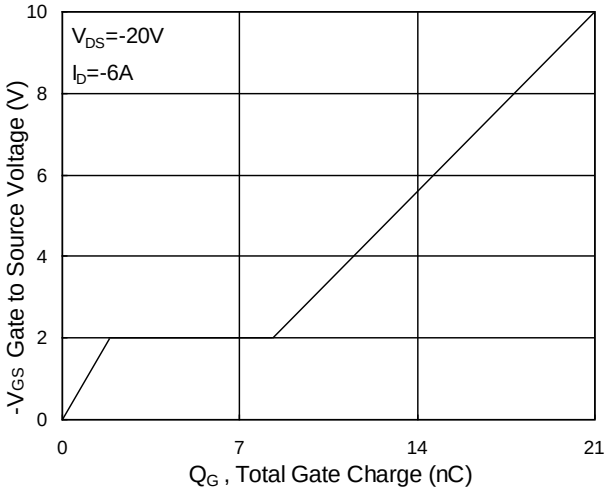


Fig.4 Gate-Charge Characteristics

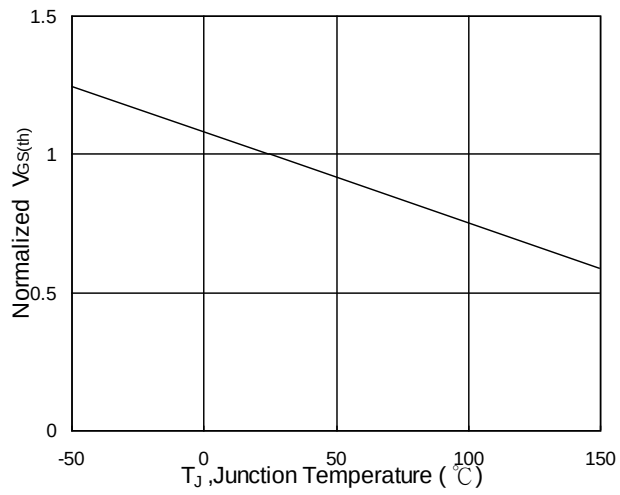


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

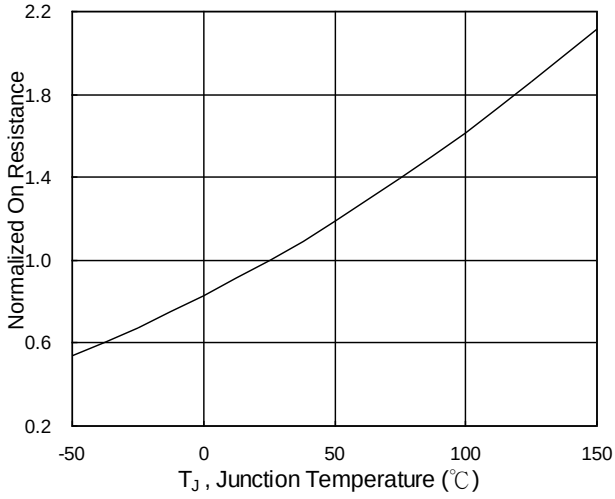


Fig.6 Normalized R_{DSON} v.s T_J

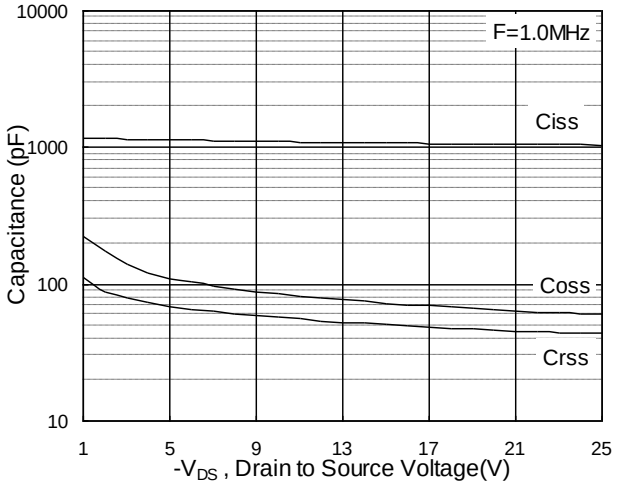


Fig.7 Capacitance

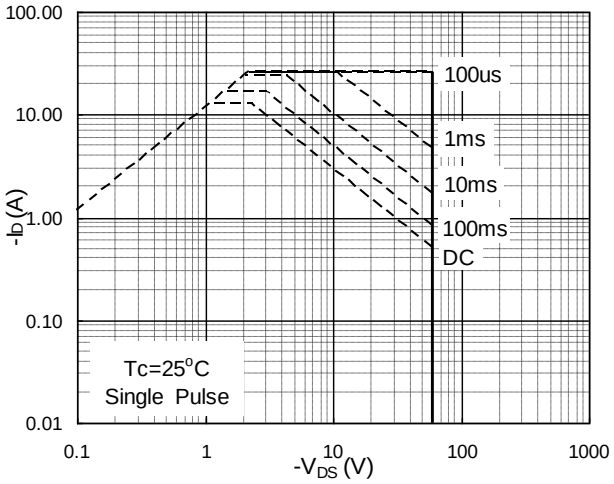


Fig.8 Safe Operating Area

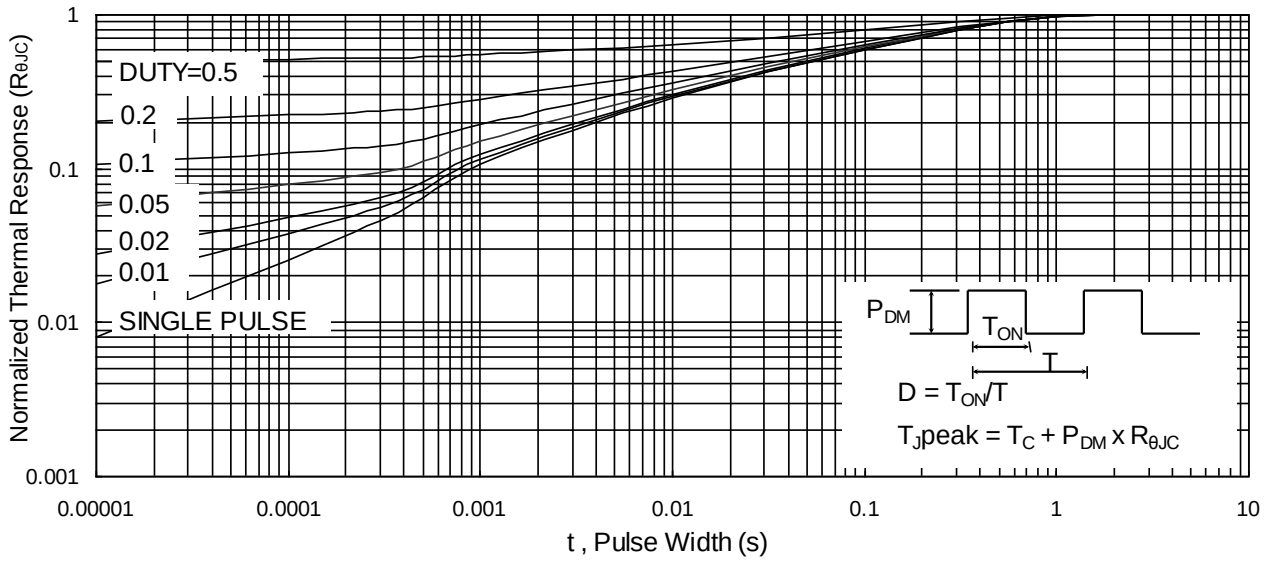


Fig.9 Normalized Maximum Transient Thermal Impedance

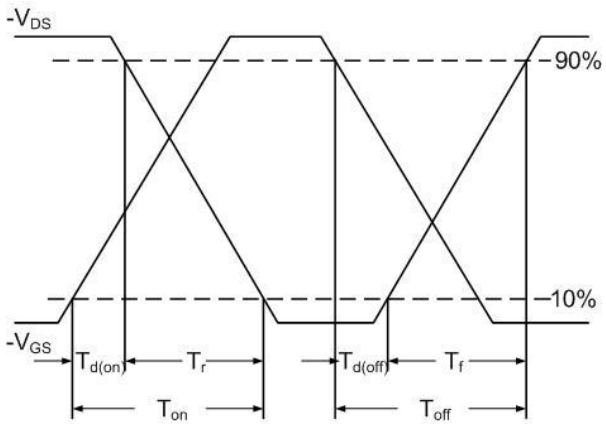


Fig.10 Switching Time Waveform

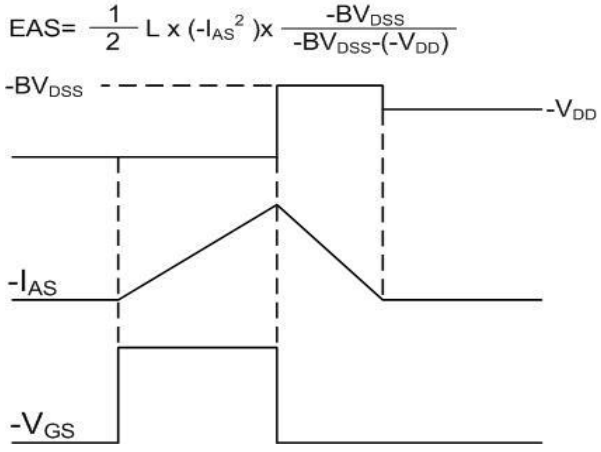
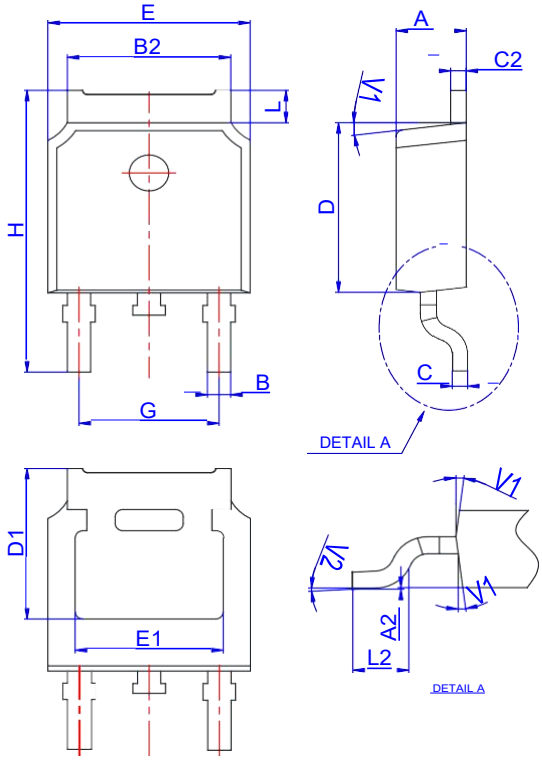


Fig.11 Unclamped Inductive Switching Waveform

Package Outlines Dimensions (Units: mm)

TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

***Important Usage Information and Disclaimer**

The specifications of Zhuhai Hypersemi Co., Ltd. products are not guarantees of product characteristics. They reflect typical performance expected in standard applications, which may vary with specific uses. Users must conduct prior testing for their applications and make necessary adjustments.

Users are responsible for the safety of applications utilizing our products and must implement adequate safety measures to prevent physical injury, fire, or other risks in case of product failure. It is the user's duty to ensure that application designs comply with all applicable laws and standards. Our products must not be used in any applications where a product failure could reasonably result in personal injury, unless specifically authorized in a signed document by Zhuhai Hypersemi Co., Ltd.

No representations or warranties are made regarding the accuracy or completeness of this information, including any claims of non-infringement of third-party intellectual property rights. Zhuhai Hypersemi Co., Ltd. assumes no liability for any applications or uses of its products and does not grant any licenses to its intellectual property rights or those of others. We also make no claims regarding non-infringement of third-party intellectual property rights that may arise from applications.

Due to technical requirements, our products may contain hazardous substances. For details, please contact your nearest sales office. This document replaces all previous information and may be updated. We reserve the right to make changes.