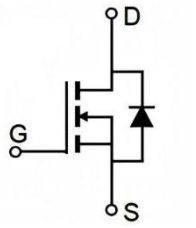
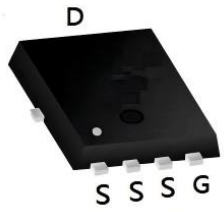
N-Channel Enhancement Mode MOSFET

Parameter	Value	Unit
V_{DS}	150	V
$R_{DS(on)}$	16	mΩ
I_D	50	A





PDFN5x6

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low RDS(ON)

Applications

- DC-DC converters
- Power management functions
- Synchronous-rectification applications

Absolute Maximum Ratings (Ta=25℃,unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25℃	I_D	50	A
	T_C=100℃		31.6	
Pulsed Drain Current		I_{DM}	200	A
Single Pulse Avalanche Energy		E_{AS}	135.2	mJ
Avalanche Current		I_{AS}	26	A
Total Power Dissipation	T_C=25℃	P_D	104.1	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	$R_{\theta JA}$	--	50	℃/W
Thermal Resistance Junction-Case	$R_{\theta JC}$	--	1.2	℃/W

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	B_{VDSS}	V_{GS}=0V, I_D=250uA	150	--	--	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	--	16	19.5	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	2.5	3	3.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=150V,V_{GS}=0V,T_J=25℃	--	--	1	uA
		V_{DS}=150V,V_{GS}=0V,T_J=100℃	--	--	100	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	--	--	±100	nA
Forward Transconductance	gfs	V_{GS}=10V, I_D=20A	--	50	--	S
Gate Resistance	R_G	V_{DS}=0V,V_{GS}=0V, f=1MHz	--	2.3	--	Ω
Total Gate Charge	Q_g	I_D=20A, V_{DS}=75V V_{GS}=10V	--	24.8	--	nC
Gate-Source Charge	Q_{gs}		--	7.5	--	
Gate-Drain Charge	Q_{gd}		--	4.2	--	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=75V, R_G=3Ω V_{GS}=10V, I_D=20A	--	11.3	--	ns
Rise Time	T_r		--	5.2	--	
Turn-Off Delay Time	$T_{d(off)}$		--	21.2	--	
Fall Time	T_f		--	4.5	--	
Input Capacitance	C_{iss}	V_{DS}=75V, V_{GS}=0V , f=1MHz	--	1832	--	pF
Output Capacitance	C_{oss}		--	148	--	
Reverse Transfer Capacitance	C_{rss}		--	8.2	--	

Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	V_G=V_D=0V , Force Current	--	--	50	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=20A ,T_J=25℃	--	--	1.2	V
Reverse Recovery Time	t_{rr}	di/dt=100A/μs T_J=25℃, I_F=20A	--	70	--	ns
Reverse Recovery Charge	Q_{rr}		--	154.7	--	nC

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.4mH, I_{AS}=26A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test..

Typical Characteristics

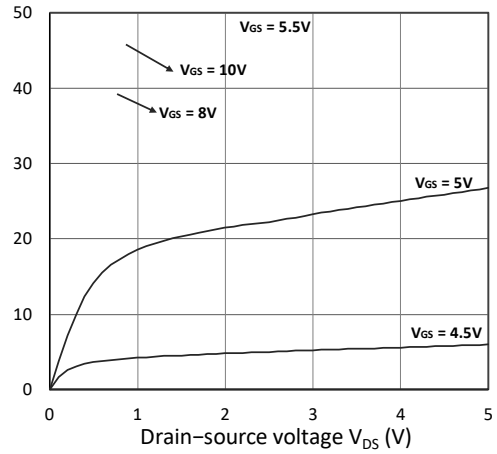


Figure 1. Output Characteristics

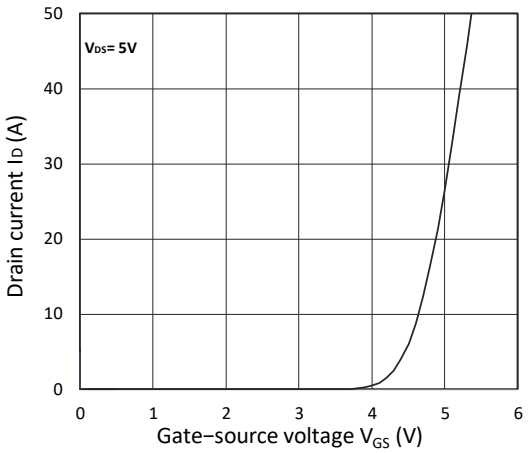


Figure 2. Transfer Characteristics

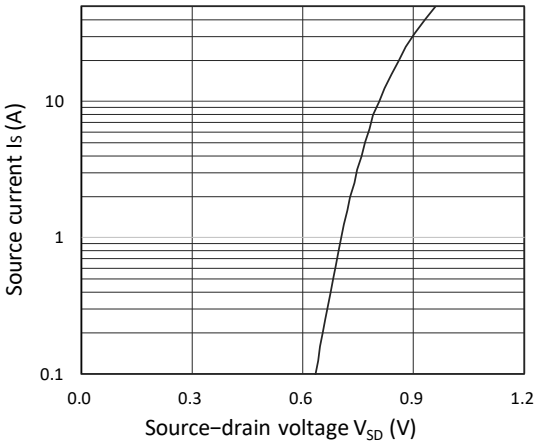


Figure 3. Forward Characteristics of Reverse

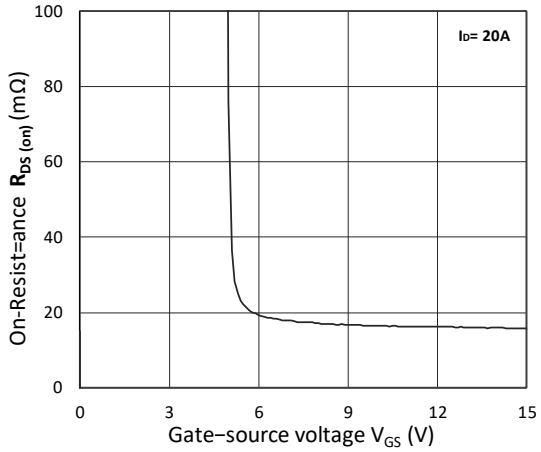


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

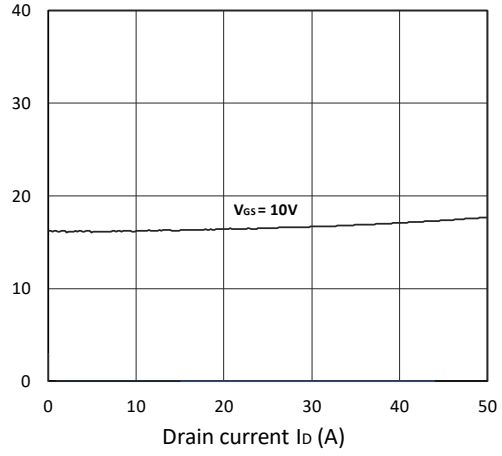


Figure 5. $R_{DS(ON)}$ vs. I_D

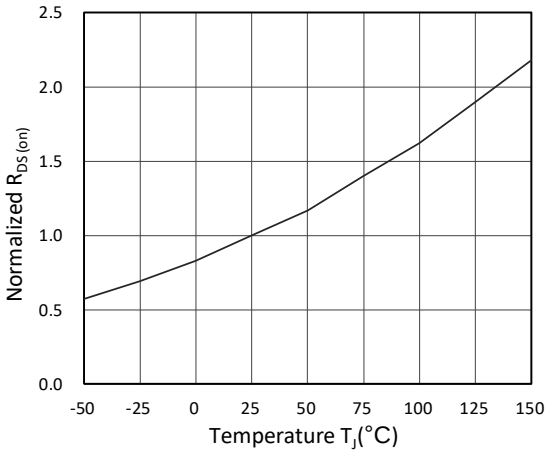


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

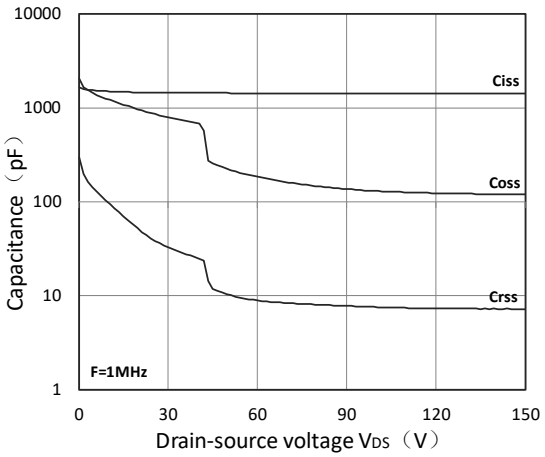


Figure 7. Capacitance Characteristics

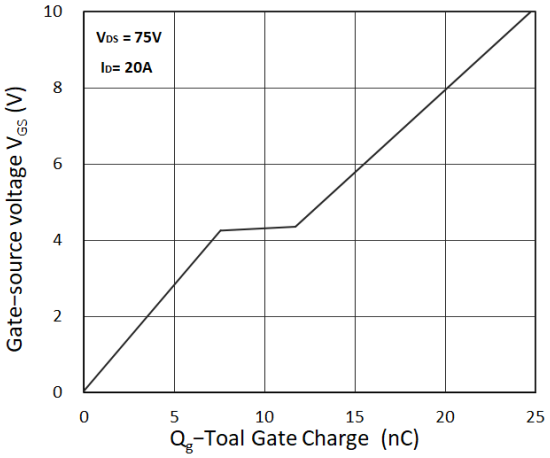


Figure 8. Gate Charge Characteristics

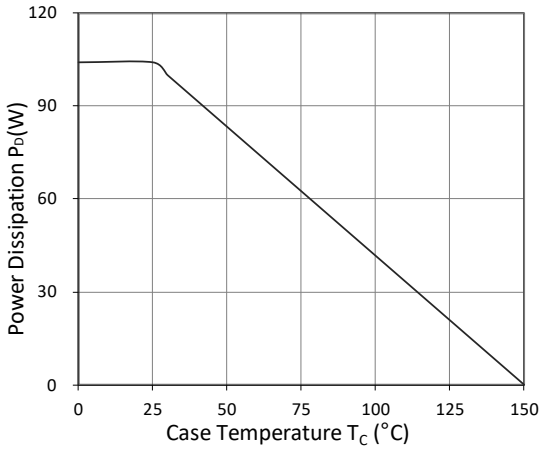


Figure 9. Power Dissipation

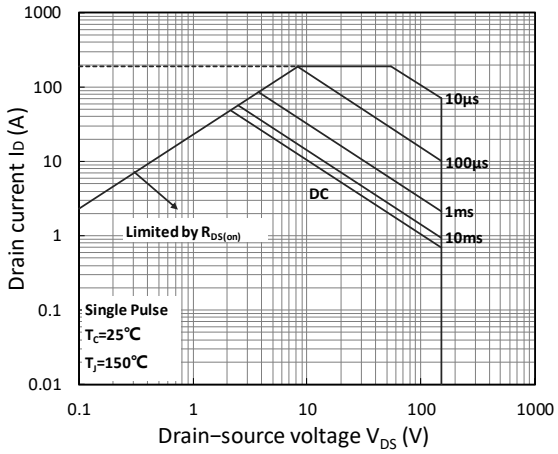


Figure10. Safe Operating Area

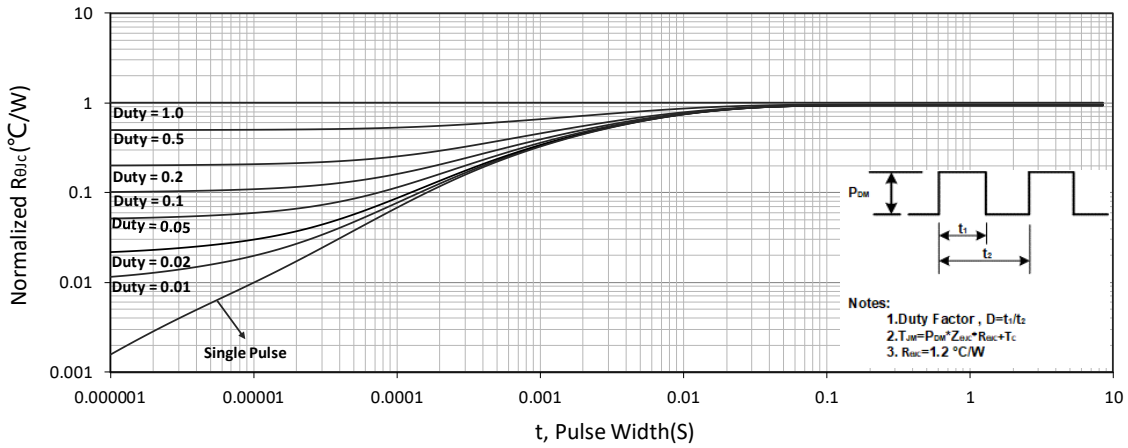
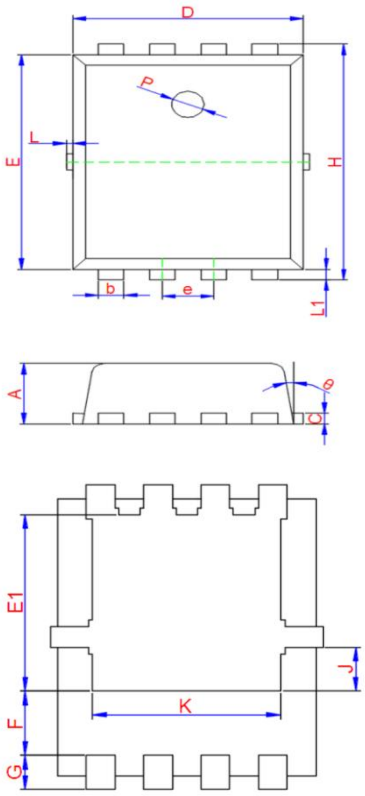


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (Units: mm)

PDFN5x6



Symbol	Dimensions in mm		
	Min.	Typ.	Max.
A	0.800	1.050	1.200
b	0.250	0.350	0.490
c		0.254TYP.	
D	4.800	5.000	5.100
e		1.270TYP.	
E	5.650	5.800	5.900
E1		3.400TYP.	
F		1.300TYP.	
G		0.600TYP.	
H	5.950	6.080	6.200
J		0.950TYP.	
K		4.000TYP	
L	-	-	0.150
L1	0.100	0.140	0.180
P		1.180TYP.	
θ	6°	10°	14°

***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.