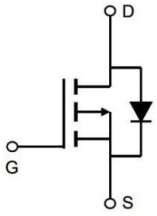
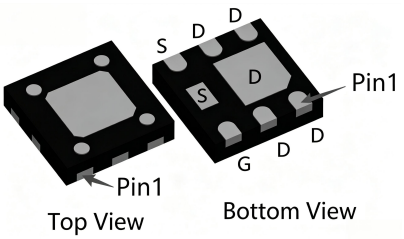
P-Channel Enhancement MOSFET

Parameter	Value	Unit
V_{DS}	-18	V
$R_{DS(on)}$	23	mΩ
I_D	18	A





DFN2020-6L

Features

- Advanced trench cell design
- Low Thermal Resistance
- Low Gate Charge
- Fast Switching Speed

Applications

- Load Switch
- DC-DC converters
- Load Switch for Portable Devices
- Voltage controlled small signal switch

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-18	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_C=25℃	I_D	-18	A
	T_C=75℃	I_D	-12	A
Peak Drain Current, Pulsed [1]		I_{DM}	-64	A
Single Pulse Avalanche Energy [2]		E_{AS}	35	mJ
Power Dissipation	T_C=25℃	P_{tot}	18	W
	-Derate above 25℃	P_{tot}		
Operating Junction		T_J	-55~ 150	℃
Storage Temperature Range		T_{stg}	-55~ 150	℃

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Lead	$R_{\theta JC}$	10	℃/W
Thermal Resistance from Junction to Ambient [5]	$R_{\theta JA}$	61	℃/W

Note:

1. Pulse width limited by maximum junction temperature
2. L=0.5mH, Voo=-10V,VG=-10V,RG=252, starting T=25°C
3. Pulse Test Pulse width s300us, Duty cycles 2%
4. Essentially independent of operating temperature
5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

Electrical Characteristics(T_J=25℃unless otherwise noted)

Parameter		Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage at I_D=-250μA		BV_{DSS}	-16	-18		V
Drain-Source Leakage Current at V_{DS}=-15V		I_{DSS}			1	μA
Gate Leakage Current at V_{GS}=±12V		I_{GSS}			±100	nA
Gate-Source Threshold Voltage at V_{DS}=V_{GS}, I_D=-250μA		$V_{GS(th)}$	-0.4	-0.7	-1.0	V
Drain-Source On-State Resistance at V_{GS}=-4.5V, I_D=-3.0A		$R_{DS(on)}$		23	30	mΩ
DYNAMIC PARAMETERS						
Input Capacitance at V_{GS}=0V, V_{DS}=-10V, f=1MHz		C_{iss}		837		pF
Output Capacitance at V_{GS}=0V, V_{DS}=-10V, f=1MHz		C_{oss}		126		
Reverse Transfer Capacitance at V_{GS}=0V, V_{DS}=-10V, f=1MHz		C_{rss}		81		
Gate charge total at V_{DS}=-10V, I_D=-2A, V_{GS}=-4 .5V		Q_g		8.9		nC
Gate to Source Charge at V_{DS}=-10V, I_D=-2A, V_{GS}=-4 .5V		Q_{gs}		1.4		
Gate to Drain Charge at V_{DS}=-10V, I_D=-2A, V_{GS}=-4 .5V		Q_{gd}		1.9		
Turn-On Delay Time at V_{GS}=-4.5V, V_{DS}=-10 V, I_D=-3.3A, R_g=1Ω		$t_{d(on)}$		10.3		nS
Turn-On Rise Time at V_{GS}=-4.5V, V_{DS}=-10 V, I_D=-3.3A, R_g=1Ω		t_r		31		
Turn-Off Delay Time at V_{GS}=-4.5V, V_{DS}=-10 V, I_D=-3.3 A, R_g=1Ω		$t_{d(off)}$		52		
Turn-Off Fall Time at V_{GS}=-4.5V, V_{DS}=-10 V, I_D=-3.3 A, R_g=1Ω		t_f		53		
Body-Diode PARAMETERS						
Diode Forward Voltage at I_S=-7A, V_{GS}=0V		V_{SD}		-0.8	-1.2	V
Continuous Source Current	Integral Reverse P-N Junction Diode in the MOSFET	I_S			-18	A
Pulsed Source Current		I_{SM}			-64	

Note:

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Characteristics

Figure1: Output Characteristics

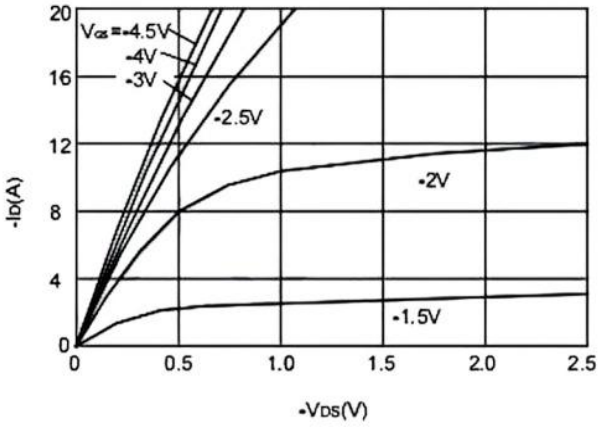


Figure 2: Typical Transfer Characteristics

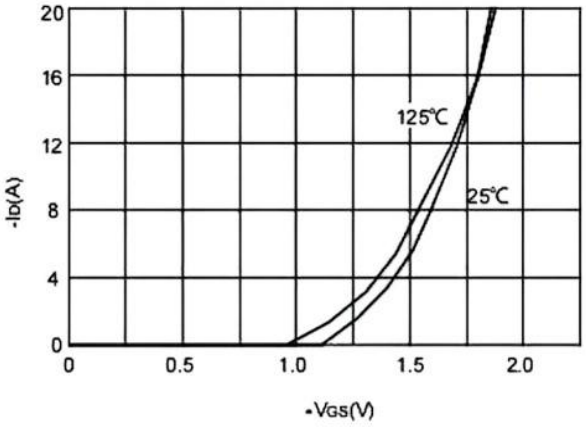


Figure 3: On-resistance vs. Drain Current

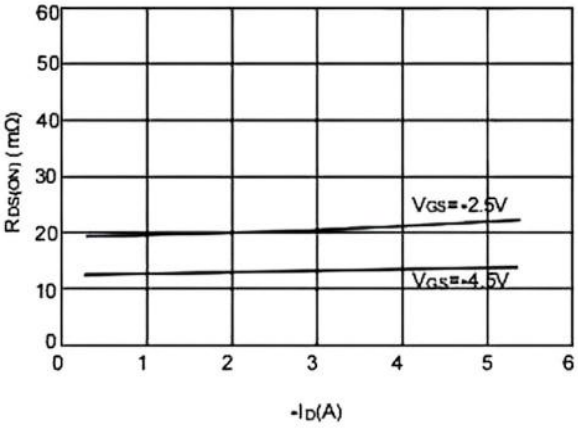


Figure 4: Body Diode Characteristics

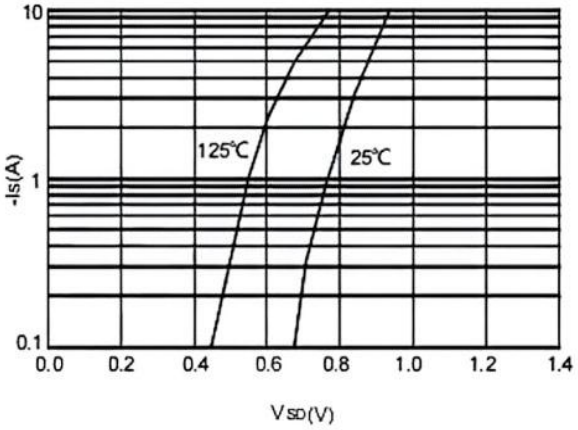


Figure 5 : Capacitance Characteristics

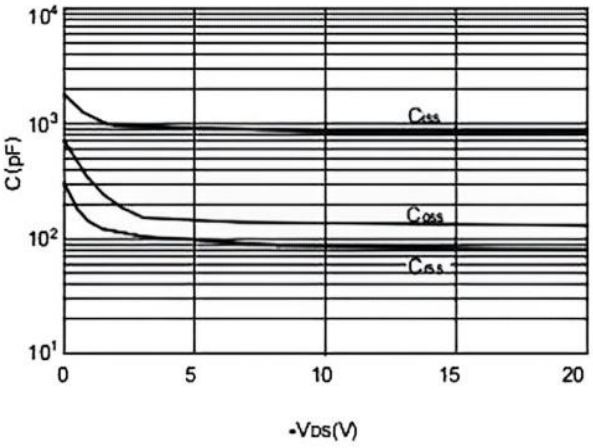


Figure 6 : Gate Charge Characteristics

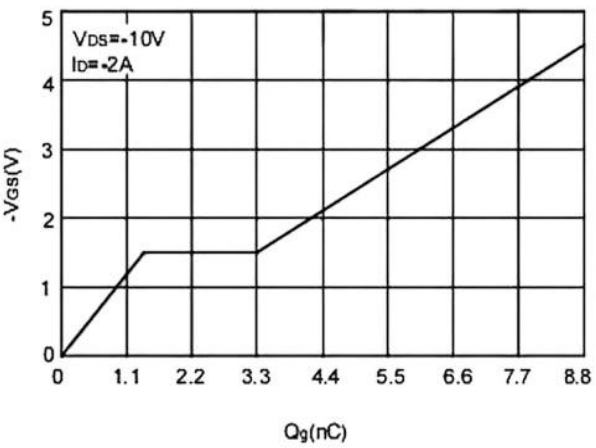


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

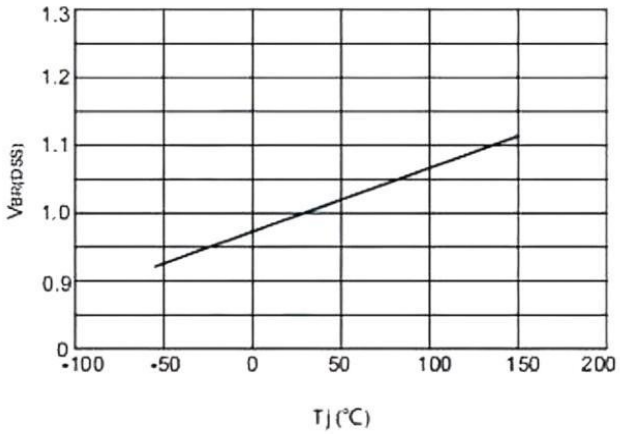


Figure 8: Normalized on Resistance vs. Junction Temperature

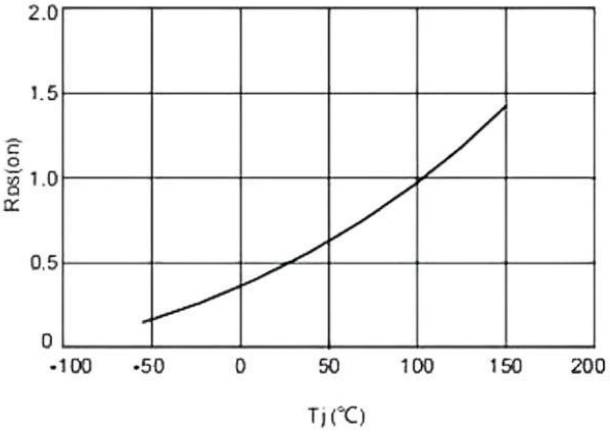


Figure 9: Maximum Safe Operating Area

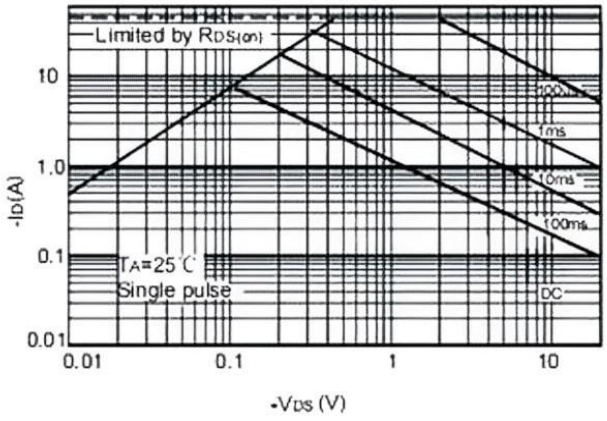
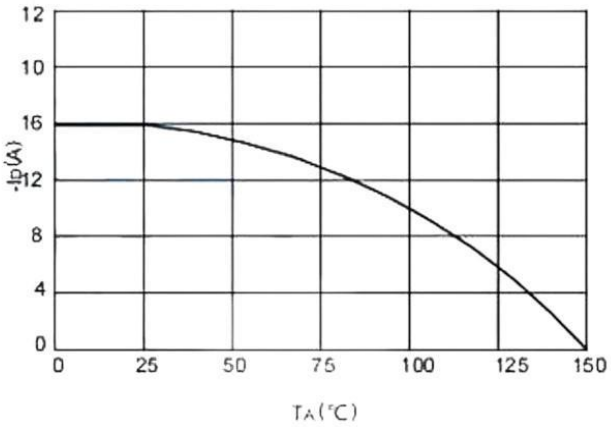
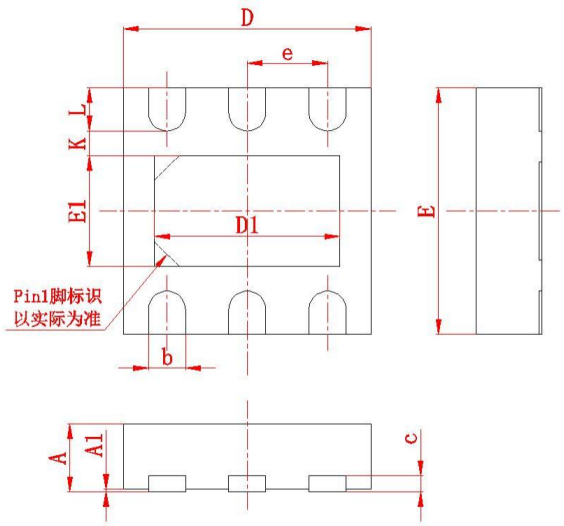
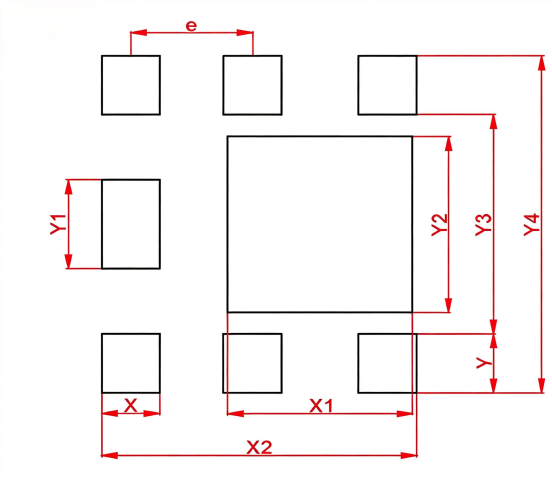


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature



Package Outlines (Units: mm)





Symbol	Size (mm)		Symbol	Size (mm)		Symbol	Size (mm)	
	Min	Max		Min	Max		Min	Max
A	0.5	0.6	E	1.9	2.1	b	0.25	0.35
A1	0	0.05	E1	1.10	1.20	c	(0.127)	
D	1.9	2.1	E2	0.60	0.65	L	0.3	0.4
D1	0.9	1.0	K	(0.35)				
D2	0.25	0.35	e	(0.65)				

DFN2020-6L	
Dim	(mm)
X	0.40
X1	0.95
X2	1.70
e	0.65
Y	0.43
Y1	0.75
Y2	1.15
Y3	1.54
Y4	2.39

***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.