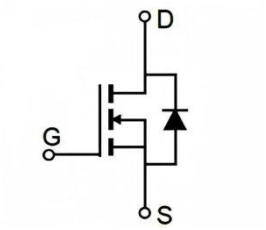
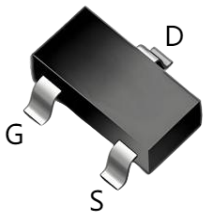
N-Channel Enhancement Mode MOSFET

Parameter	Value	Unit
V_{DS}	20	V
$R_{DS(on)}$	45	mΩ
I_D	3.0	A





SOT-23

Features

- Advanced Trench Process Technology
- Low Threshold Voltage
- Fast Switching Speed

Applications

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

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

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_A=25℃	I_D	3.0	A
Continuous Drain Current	T_A=70℃	I_D	1.2	A
Pulsed Drain Current [2]		I_{DM}	12	A
Total Power Dissipation [3]	T_A=25℃	P_D	0.85	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]	$R_{\theta JA}$	---	162	℃/W
Thermal Resistance Junction-Case [1]	$R_{\theta JC}$	---	---	℃/W

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1.0	μA
Gate to Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}= ±12V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.4	0.7	1.0	V
Static Drain-Source on-Resistance note[2]	$R_{DS(on)}$	V_{GS}=4.5V, I_D=3A	-	45	55	mΩ
		V_{GS}=2.5V, I_D=3A	-	62	85	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V, f=1.0MHz	-	184	-	pF
Output Capacitance	C_{oss}		-	38	-	pF
Reverse Transfer Capacitance	C_{rss}		-	28	-	pF
Total Gate Charge	Q_g	V_{DS}=10V, I_D=3A, V_{GS}=4.5V	-	2.7	-	nC
Gate-Source Charge	Q_{gs}		-	0.4	-	nC
Gate-Drain(“Miller”) Charge	Q_{gd}		-	0.5	-	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=10V,I_D=3A, R_{GEN}=3Ω, V_{GS}=4.5V	-	8	-	ns
Turn-on Rise Time	t_r		-	27	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	26	-	ns
Turn-off Fall Time	t_f		-	33	-	ns
Drain.Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current	I_S		-	-	3	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}		-	-	12	A
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=3A	-	-	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics

Figure1: Output Characteristics

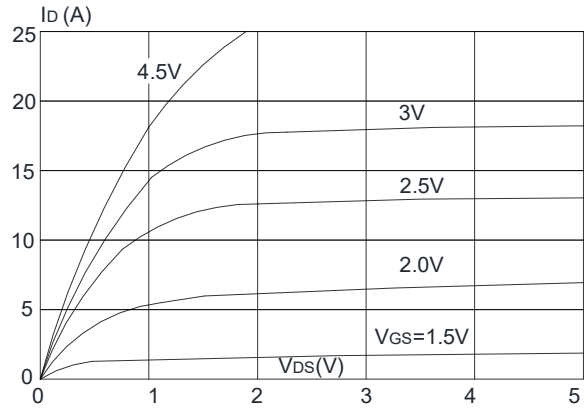


Figure 2: Typical Transfer Characteristics

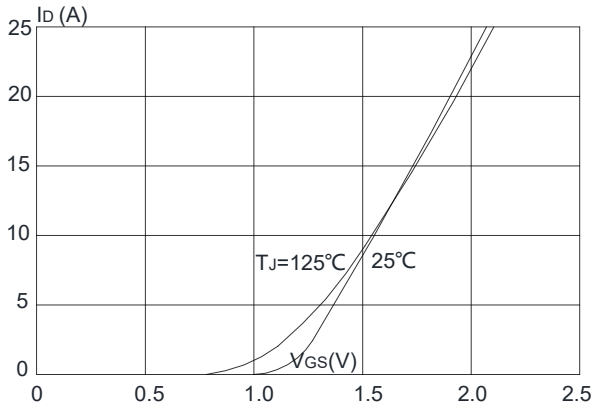


Figure 3: On-resistance vs. Drain Current

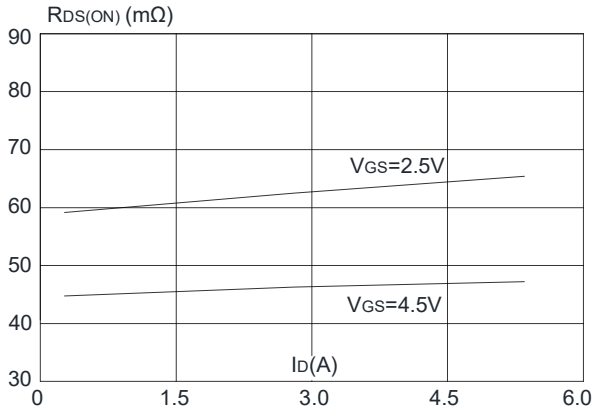


Figure 4: Body Diode Characteristics

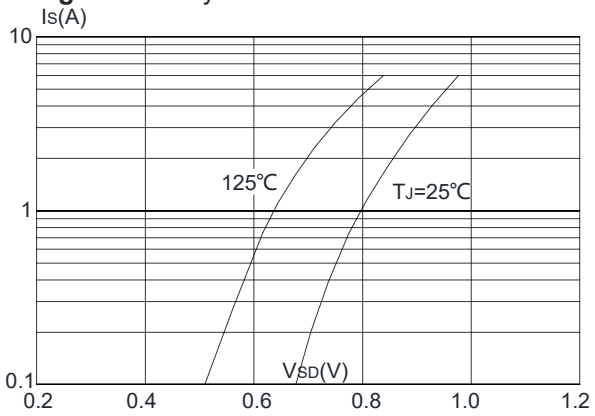


Figure 5: Gate Charge Characteristics

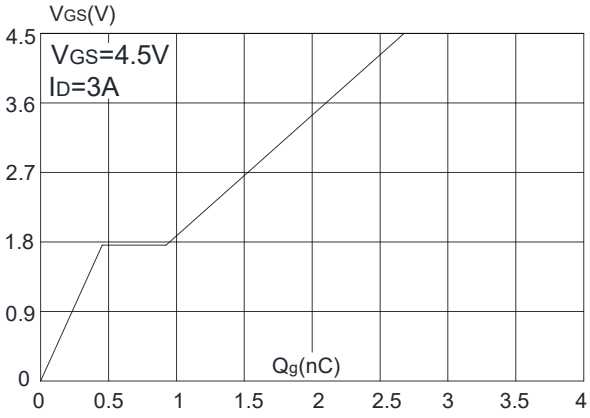


Figure 6: Capacitance Characteristics

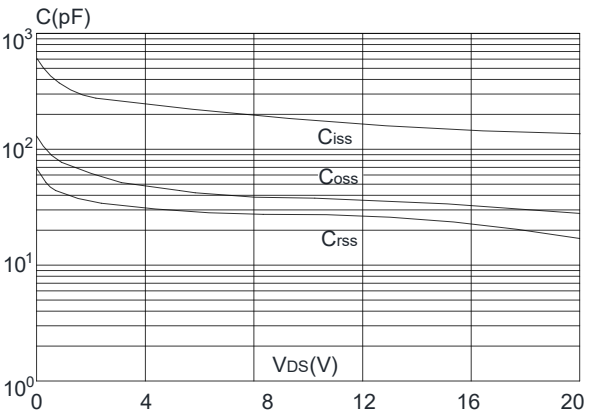


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

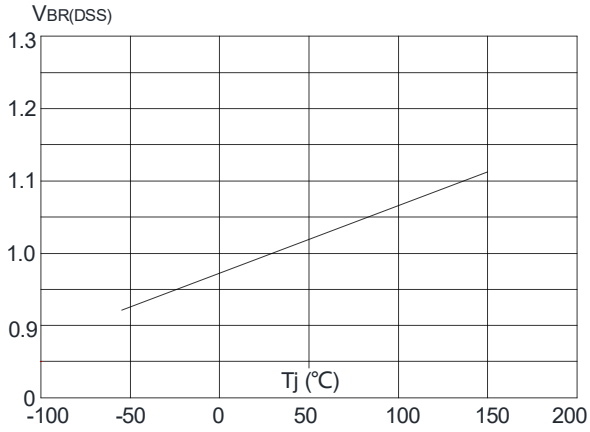


Figure 8: Normalized on Resistance vs. Junction Temperature

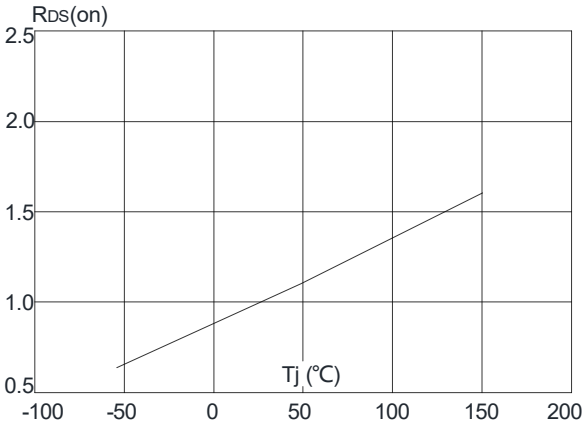


Figure 9: Maximum Safe Operating Area

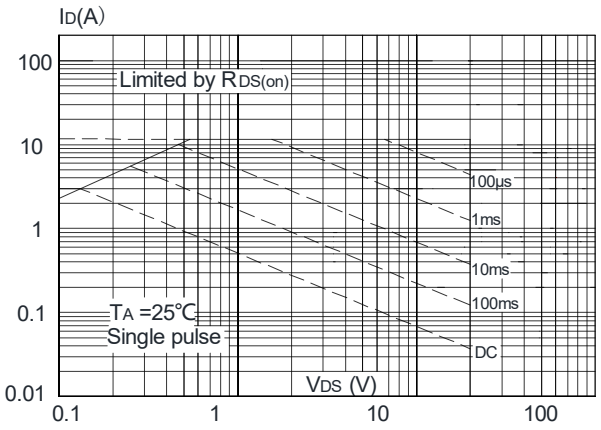


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

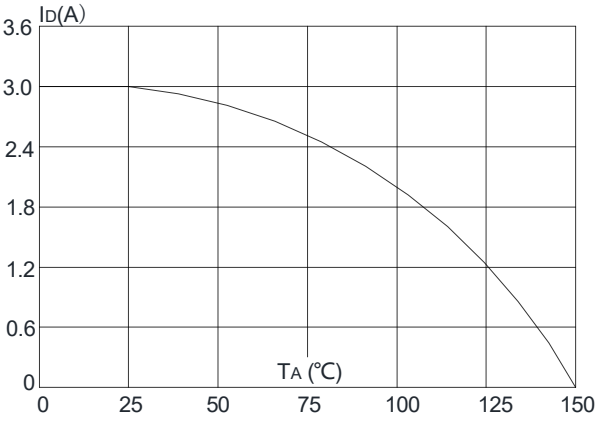
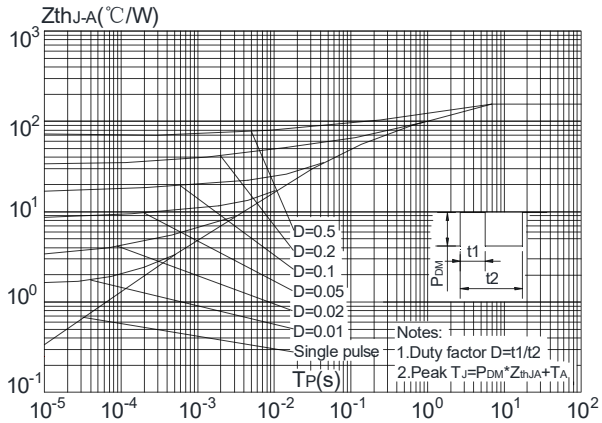
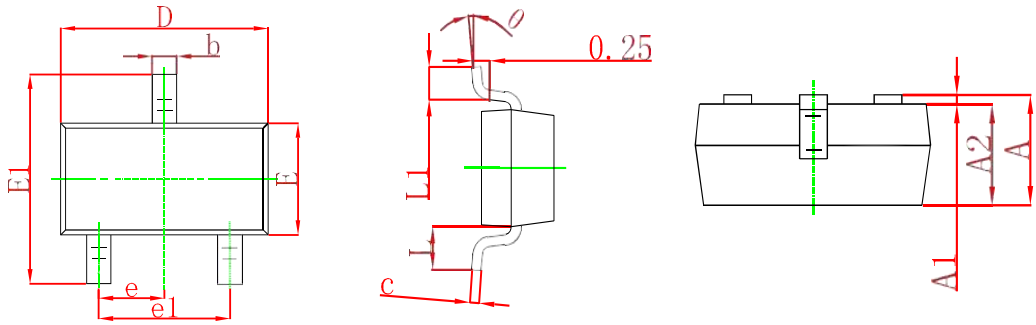


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Package Outline Dimensions (Units: mm)

SOT-23



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

***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.