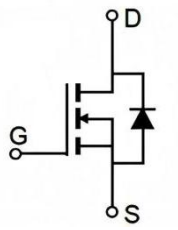
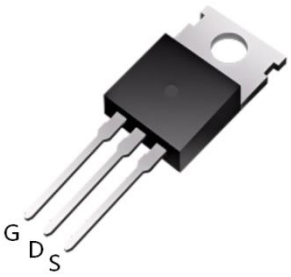
N-Channel Enhancement Mode MOSFET

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(on)}$	12	mΩ
I_D	50	A





TO-220

Features

- Fast Switching
- Low ON Resistance
- Low Gate Charge

Applications

- Load Switch
- PWM Application
- Power management

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	50	A
Peak Drain Current, Pulsed [1])	I_{DM}	200	A
Single Pulse Avalanche Energy [5])	E_{AS}	80	mJ
Power Dissipation T_C=25℃	P_{tot}	173	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case [2])	$R_{\theta JC}$	0.72	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62	℃/W

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	60	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	--	--	1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	--	--	±100	nA
Drain-source on-state resistance [3])	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A	--	12	17	mΩ
		V_{GS}=4.5V, I_D=20A	--	16	25	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS},I_D=250μA	1.0	--	2.5	V
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS}=0V,V_{DS}=25V f=1MHz	--	2950	--	pF
Output Capacitance	C_{oss}		--	130	--	
Reverse Transfer Capacitance	C_{rss}		--	115	--	
Gate Charge Characteristics						
Total gate charge	Q_g	V_{DS}=30V,V_{GS}=10V I_D=30A	--	45	--	nC
Gate-source charge	Q_{gs}		--	8	--	
Gate-drain charge	Q_{gd}		--	11	--	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V,V_{DD}=30V R_G=1.8Ω ,I_D=30A	--	11	--	nS
Rise time	t_r		--	79	--	
Turn-Off Delay Time	$t_{d(off)}$		--	33	--	
Fall time	t_f		--	105	--	
Source-Drain Diode Ratings And Characteristics						
Maximum Body-Diode Continuous Current [2])	I_S	-	--	--	50	A
Maximum Body-Diode Pulsed Current	I_{SM}	-	--	--	200	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=30A	--	--	1.2	V
Reverse Recovery Time	t_{rr}	I_S=3A;dIF/dt=100A/μs	--	14	--	ns
Reverse Recovery Charge	Q_{rr}		--	10	--	μC

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Typical Characteristics

Figure1: Output Characteristics

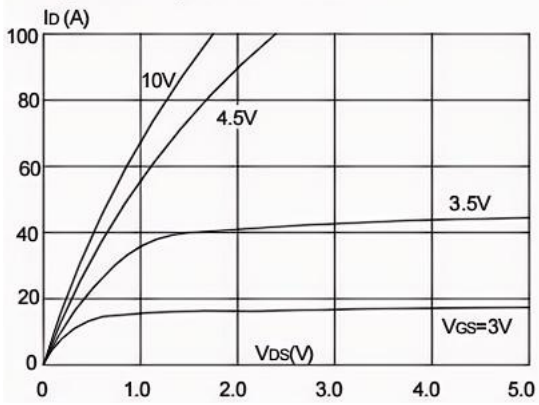


Figure 2: Typical Transfer Characteristics

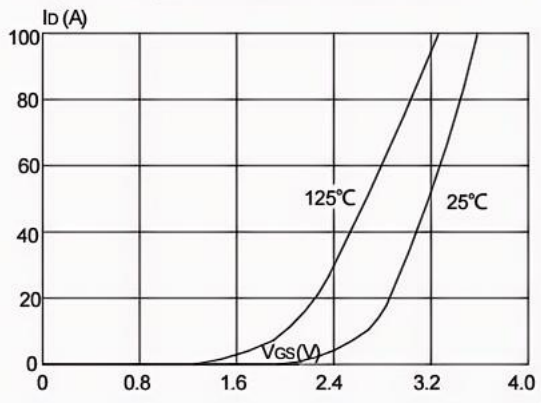


Figure 3: On-resistance vs. Drain Current

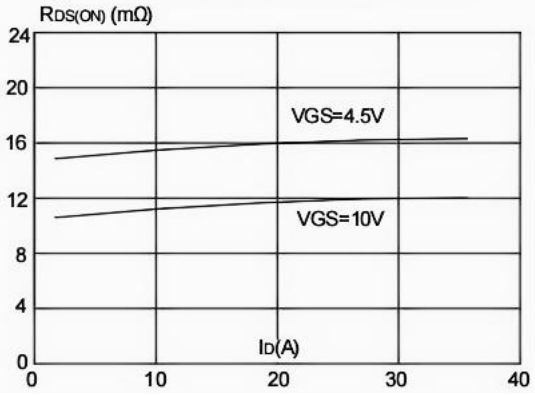


Figure 4: Body Diode Characteristics

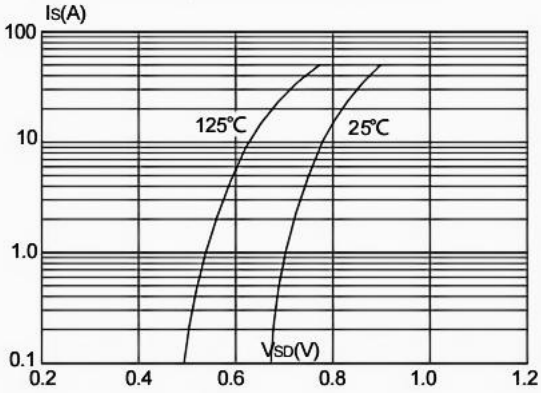


Figure 5: Gate Charge Characteristics

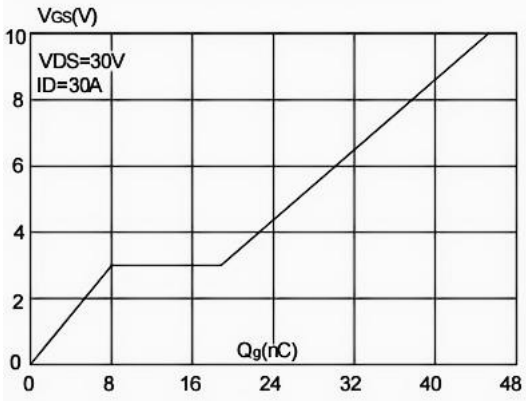


Figure 6: Capacitance Characteristics

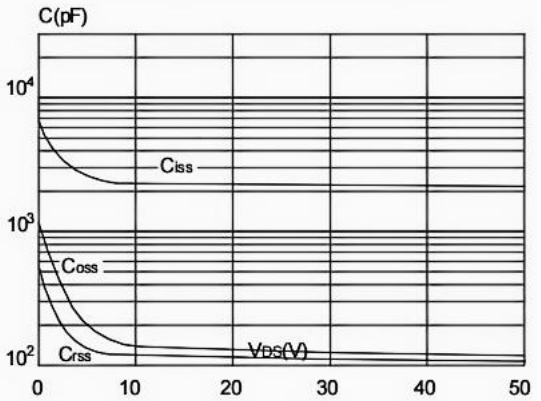


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

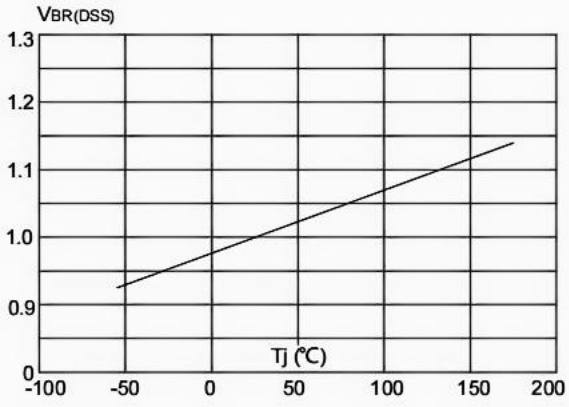


Figure 8: Normalized on Resistance vs. Junction Temperature

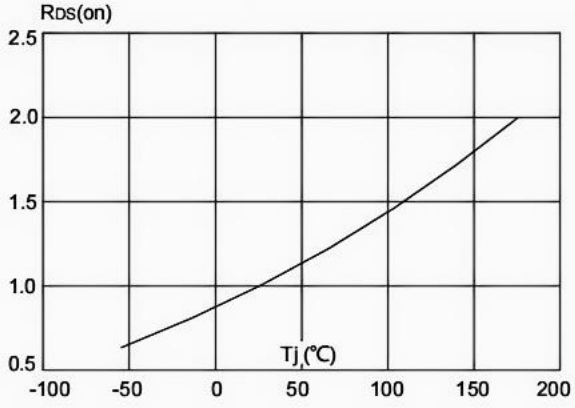


Figure 9: Maximum Safe Operating Area

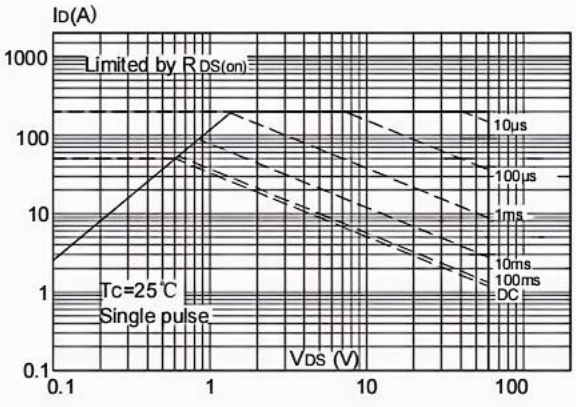


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

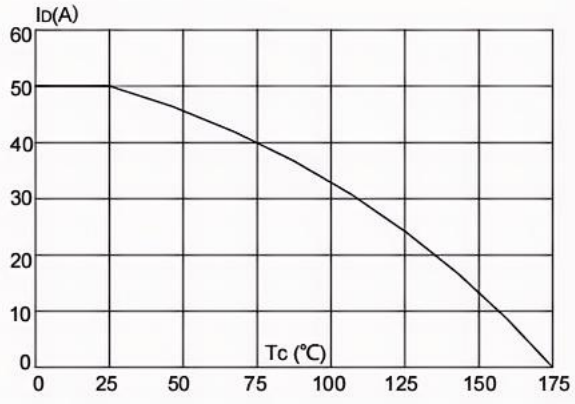
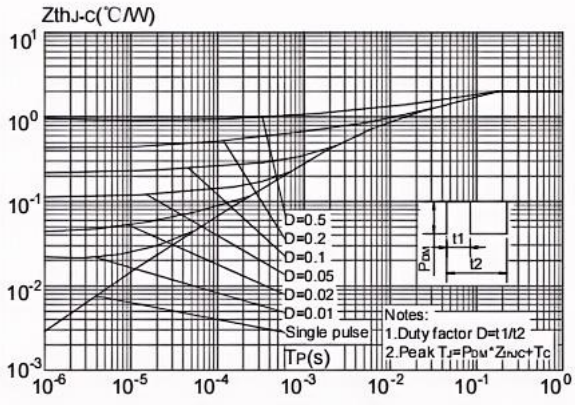
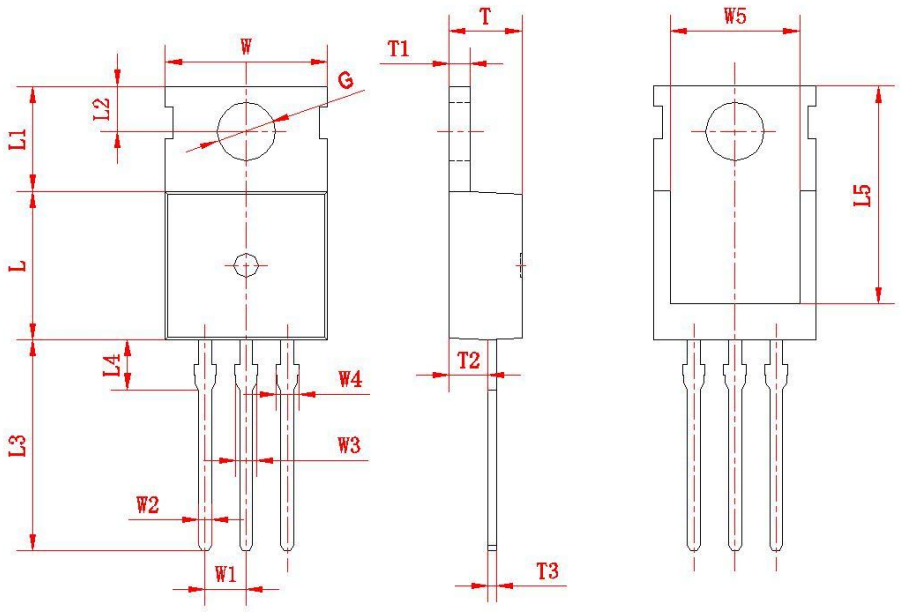


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Outline

TO-220



Symbol	Dimensions)mm)		Symbol	Dimensions(mm)		Symbol	Dimensions(mm)	
	Min	Max		Min	Max		Min	Max
W	9.80	10.20	L	9.00	9.40	T	4.30	4.70
W1	(2.54)		L1	6.30	6.70	T1	1.20	1.40
W2	0.70	0.90	L2	2.70	2.90	T2	2.20	2.60
W3	1.17	1.37	L3	12.88	13.28	T3	0.45	0.60
W4	1.17	1.62	L4	(3.10)		G	3.50	3.70
W5	(8.00)		L5	(13.5)				

***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.