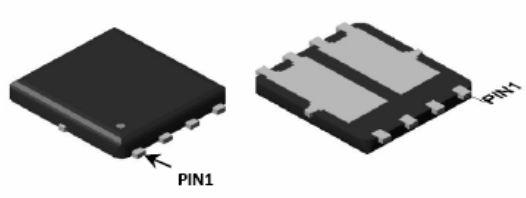
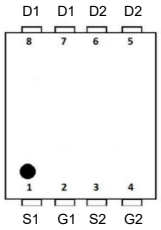
N-channel Enhancement Mode Power MOSFET

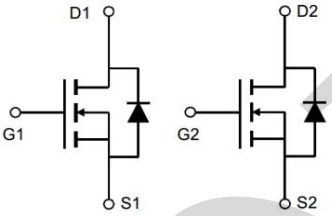
MSR015M06SD2

PDFN5x6



N-channel	V_{DS}	60	V
	$R_{DS(on),TYP}$@ V_{GS}=10 V	15	mΩ
	I_D	40	A





Features

1、Provide Excellent RDS(ON) and Low Gate Charge
2、High power package (PDFN5X6)
3、Advanced Trench Technology

Applications

1、Load Switch
2、PWM Application
3、Power management

Maximum ratings, at T_A =25°C, unless otherwise specified

Symbol	Parameter		Max.	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		60	V
V_{GS}	Gate-Source voltage		±20	V
I_D	Continuous drain current @VGS=10V	T_C =25°C	40	A
		T_C =100°C	26	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	160	A
E_{AS}	Single Pulsed Avalanche Energy ②	T_C =25°C	72	mJ
P_D	Maximum power dissipation	T_C =25°C	42	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @Tj=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	1.6	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance ③	V_{GS}=10V, I_D=30A	--	12	15	mΩ
		V_{GS}=4.5V, I_D=20A	--	16	21	mΩ

Dynamic Electrical Characteristics@Tj = 25°C (unless otherwise stated)

C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V , f=1MHz	--	2030	--	pF
C_{oss}	Output Capacitance		--	130	--	pF
C_{rss}	Reverse Transfer Capacitance		--	115	--	pF
Q_g	Total Gate Charge	V_{DS}=30V, I_D=30A , V_{GS}=10V	--	45	--	nC
Q_{gs}	Gate-Source Charge		--	8	--	nC
Q_{gd}	Gate-Drain Charge		--	11	--	nC
Td(on)	Turn-on Delay Time	V_{DS}=30V, I_D=30A, R_G=1.8Ω, V_{GS}=10V	--	11	--	ns
Tr	Turn-on Rise Time		--	79	--	ns
Td(off)	Turn-Off Delay Time		--	33	--	ns
Tf	Turn-Off Fall Time		--	107	--	ns

Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)

V_{SD}	Forward on voltage	I_S=30A,V_{GS}=0V	--	--	1.2	V
I_S	Diode Forward Current		--	--	40	A
Trr	Reverse Recovery Time	I_F=30A, di/dt=100A/μs	--	14	--	ns
Qrr	Reverse Recovery Charge		--	10	--	nC

NOTE: ① Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
② EAS condition : T_J=25℃,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω,I_{AS}=17A.
③ Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics

Figure1: Output Characteristics

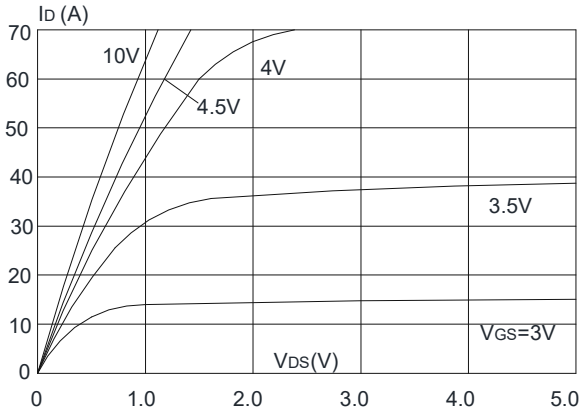


Figure 2: Typical Transfer Characteristics

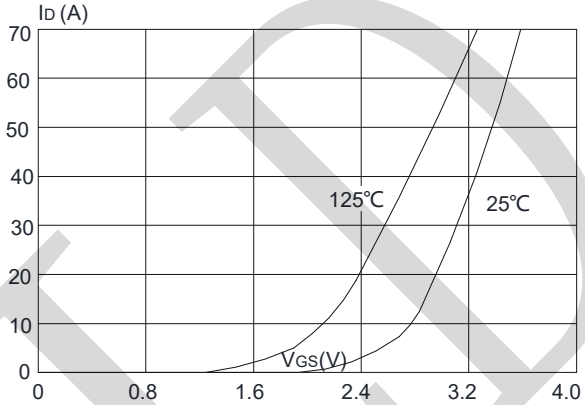


Figure 3: On-resistance vs. Drain Current

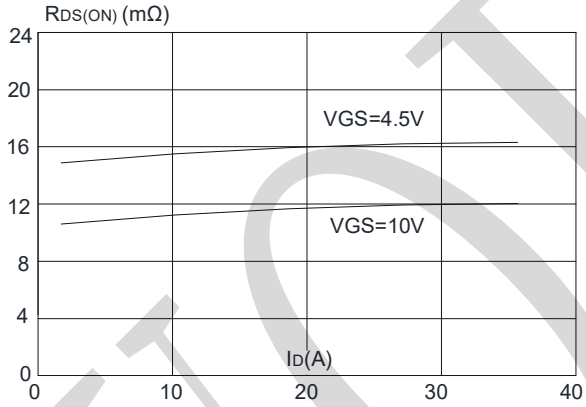


Figure 4: Body Diode Characteristics

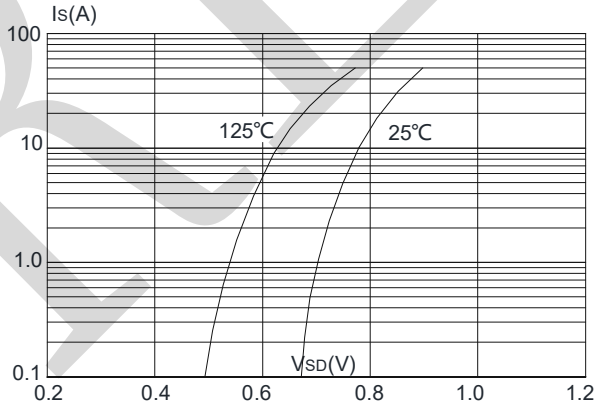


Figure 5: Gate Charge Characteristics

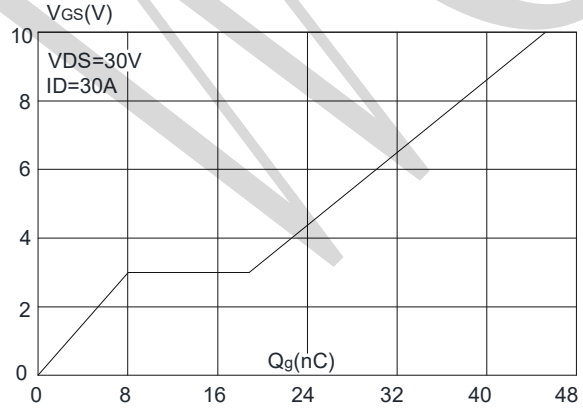
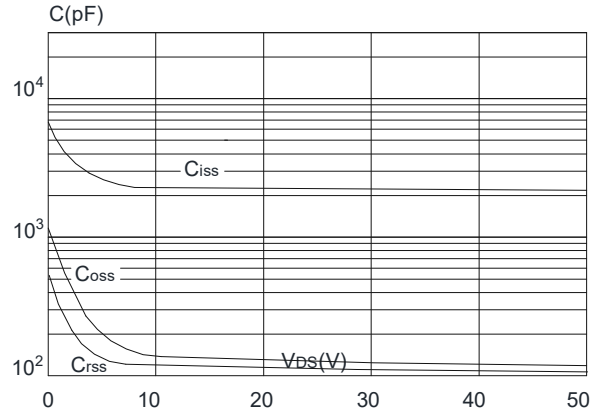


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

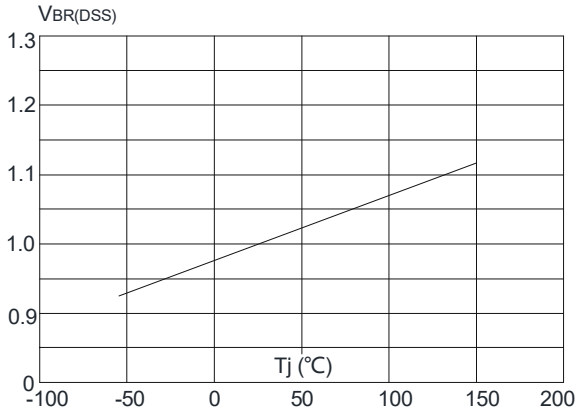


Figure 8: Normalized on Resistance vs. Junction Temperature

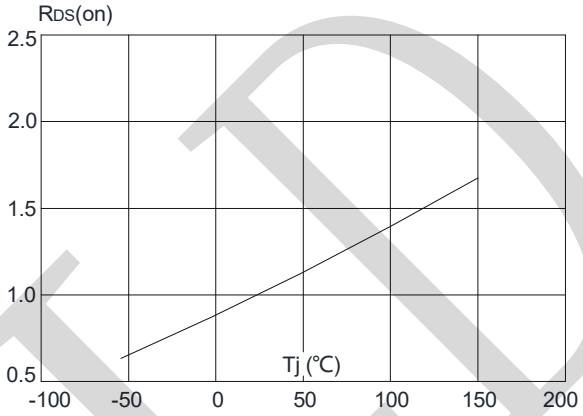


Figure 9: Maximum Safe Operating Area

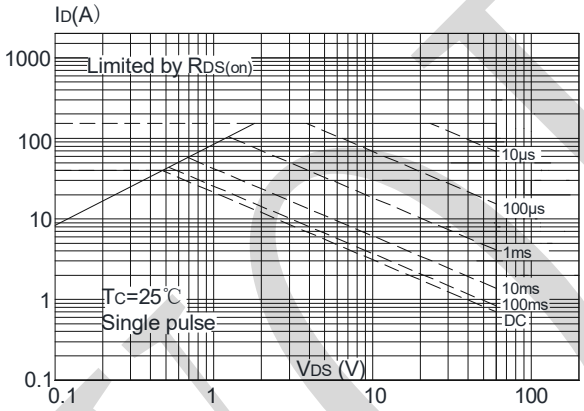


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

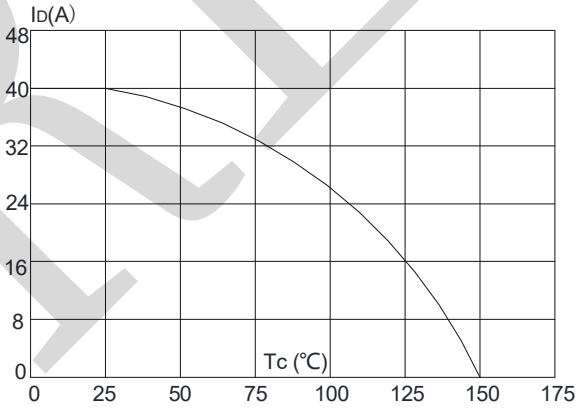
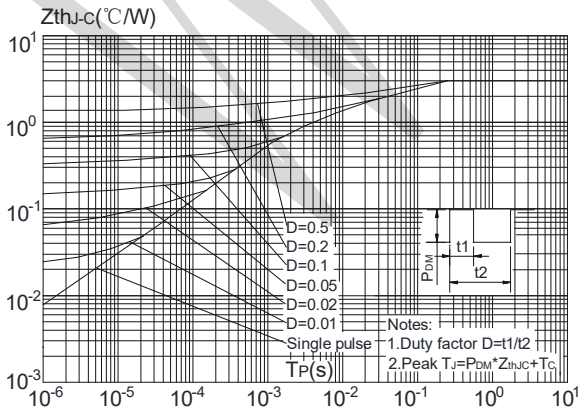
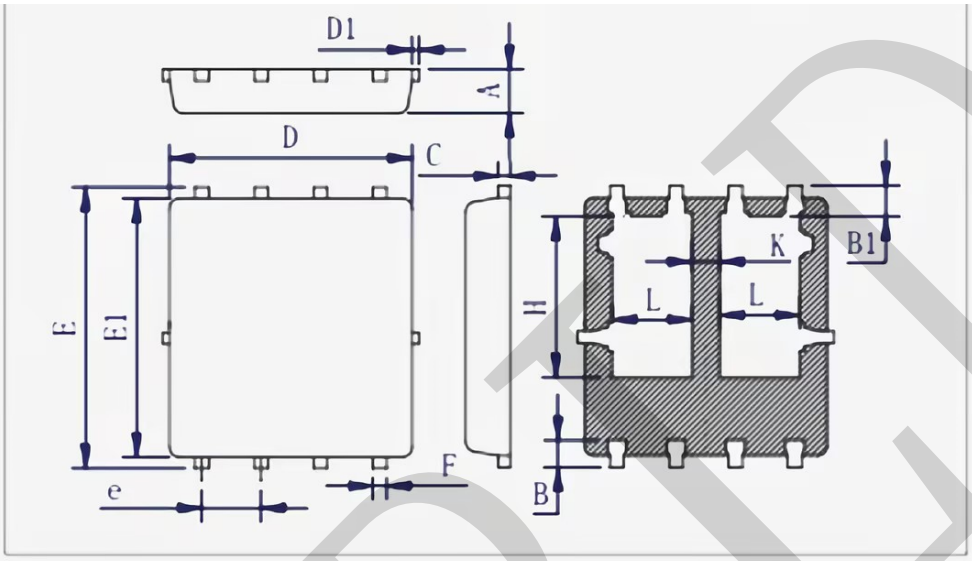


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Mechanical

PDFN5X6



Symbol	Min	Typ	Max
A	0.90	0.95	1.00
B	0.48	0.58	0.68
B1	0.55	0.65	0.75
C	0.20	0.254	0.30
D	5.10	5.20	5.30
D1			0.15
E	5.95	6.05	6.15
E1	5.40	5.55	5.70
e	1.22	1.27	1.32
F	0.25	0.30	0.35
H	3.27	3.47	3.67
L	1.50	1.70	1.90
K	0.50	0.60	0.75