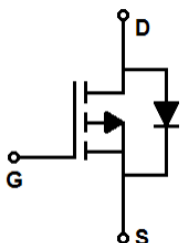
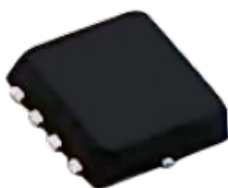


Trench P-channel Power MOSFET

MSR011P03D33

PDFN3X3



$V_{(BR)DSS}$	$R_{DS(ON)}$ Typ	I_D Max
-30V	10.5m Ω @-10V	-52A
	14.3m Ω @ -4.5V	

Features

- Low $R_{DS(on)}$ @ $V_{GS} = -10V$
- Package PDFN3X3
- -5V Logic Level Control

Applications

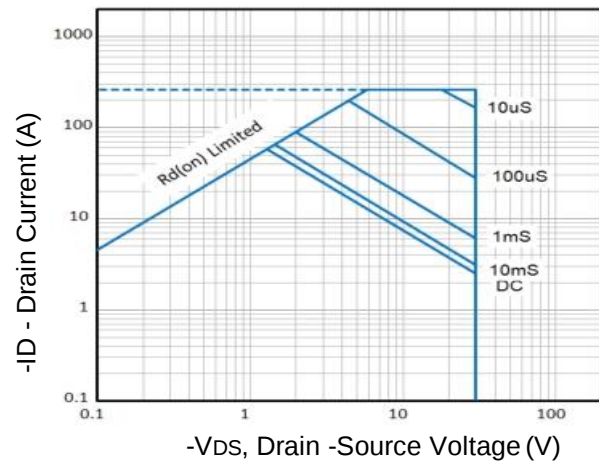
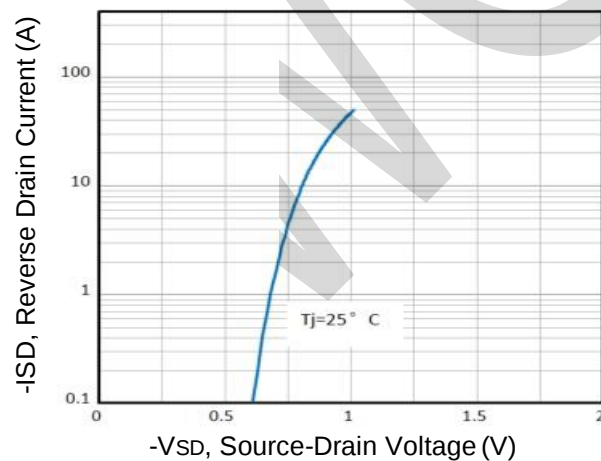
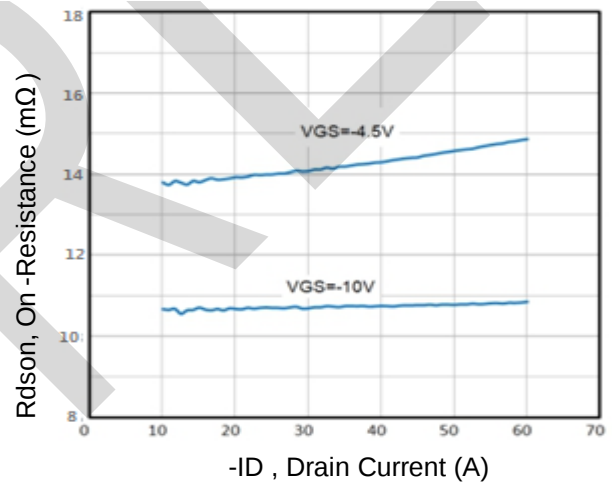
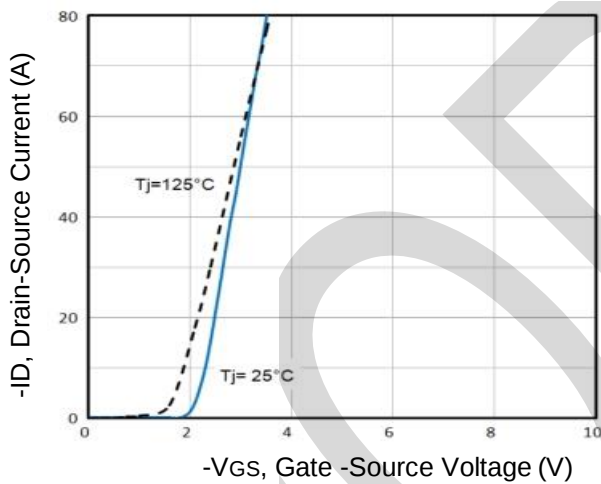
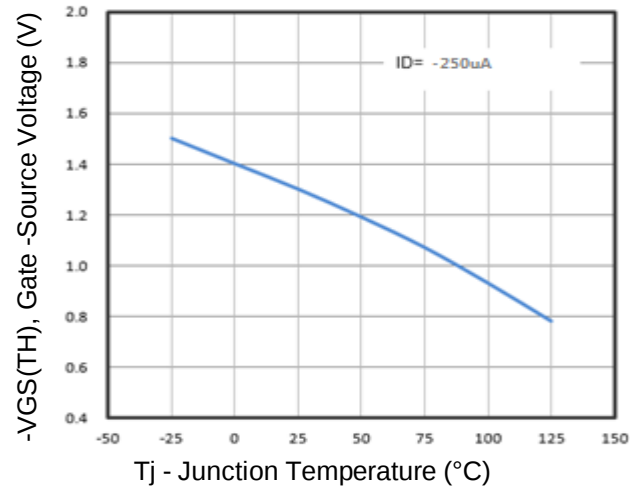
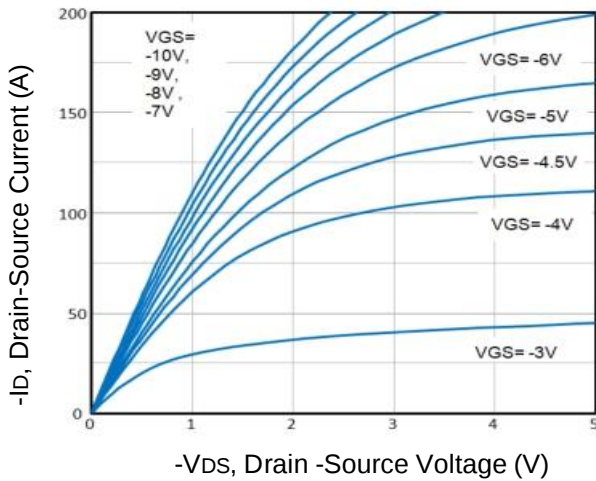
- In PWM Applications
- Load Switch
- Notebook Adapter Switch

Maximum ratings, at $T_A = 25^\circ C$, unless otherwise specified

Symbol	Parameter	Rating	Unit	
V _{GS}	Gate-Source Voltage	±20	V	
V _{(BR)DSS}	Drain-Source Breakdown Voltage	-30	V	
T _J	Maximum Junction Temperature	150	°C	
T _{STG}	Storage Temperature Range	-50 to 150	°C	
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested①	T _C =25°C	-220	A
I _D	Continuous Drain Current	T _C =25°C	-52	A
		T _C =70°C	-41.6	
P _D	Maximum Power Dissipation	T _C =25°C	50	W
		T _C =25°C	32	
EAS	Avalanche energy, single pulsed ②		101	mJ
R _{θJC}	Thermal Resistance-Junction to Case		2.5	°C/W

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =-250μA	-30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _C =25°C)	V _{DS} =-30V, V _{GS} =0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(T _C =125°C)	V _{DS} =-24V, V _{GS} =0V	--	--	-100	uA
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	-0.8	-1.2	-2.0	V
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =-10V, I _D =-15A	--	10.5	14	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =-4.5V, I _D =-10A	--	14.3	19	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	--	1360	--	pF
C _{oss}	Output Capacitance		--	373	--	pF
C _{rss}	Reverse Transfer Capacitance		--	137	--	pF
R _g	Gate Resistance	f=1MHz		13.2		Ω
Q _g	Total Gate Charge	V _{DS} =-15V I _D =-15A, V _{GS} =-10V	--	64.3	--	nC
Q _{gs}	Gate Source Charge		--	6.9	--	nC
Q _{gd}	Gate Drain Charge		--	16.5	--	nC
Switching Characteristics @ T _J = 25°C (unless otherwise stated)						
t _{d(on)}	Turn on Delay Time	V _{DD} =-15V, I _D =-1A, R _G =6Ω, V _{GS} =-10V	--	12	--	ns
t _r	Turn on Rise Time		--	41.8	--	ns
t _{d(off)}	Turn Off Delay Time		-	80	--	ns
t _f	Turn Off Fall Time		--	19.5	--	ns
Source Drain Diode Characteristics						
V _{SD}	Forward on voltage③	T _J =25°C, I _{SD} =-15A, V _{GS} =0V	--	-0.84	-1.2	V
Notes: ① Pulse width limited by maximum allowable junction temperature ② Limited by T _{Jmax} , starting T _J = 25°C, L = 0.3mH,RG = 25Ω, IAS = 26A, VGS =10V. Part not recommended for use above this value ③ Pulse width ≤ 300μs; duty cycle≤ 2%.						

Typical Characteristics



Typical Characteristics

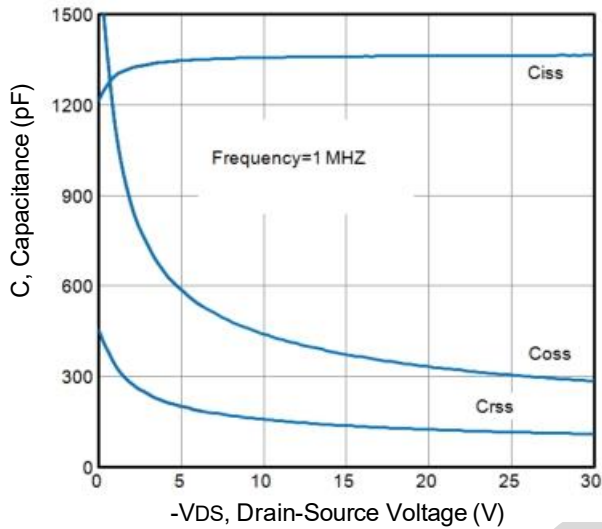


Fig7. Typical Capacitance Vs. Drain-Source Voltage

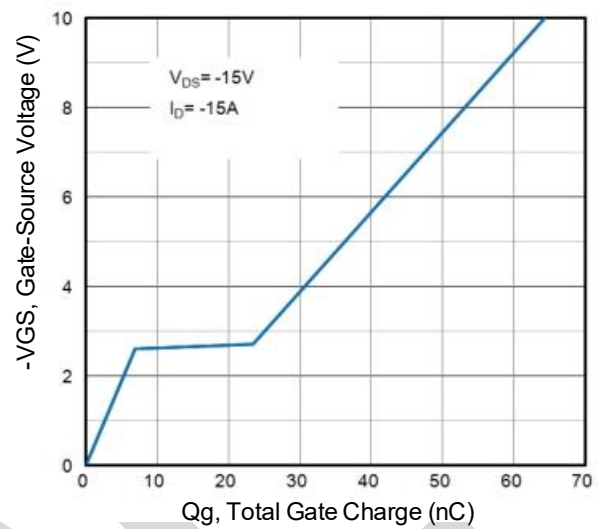


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

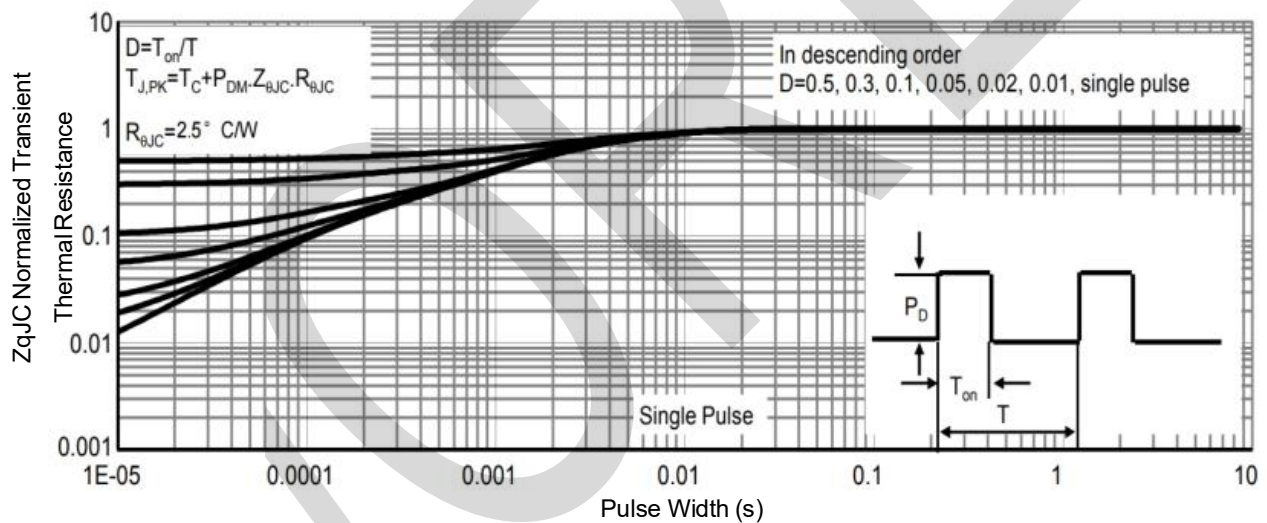


Fig9. Normalized Maximum Transient Thermal Impedance

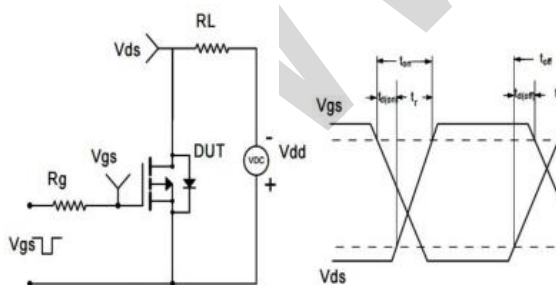


Fig10. Switching Time Test Circuit and waveforms

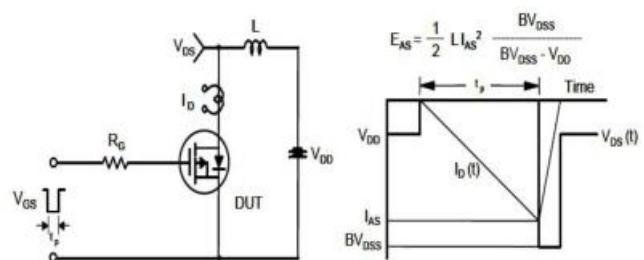
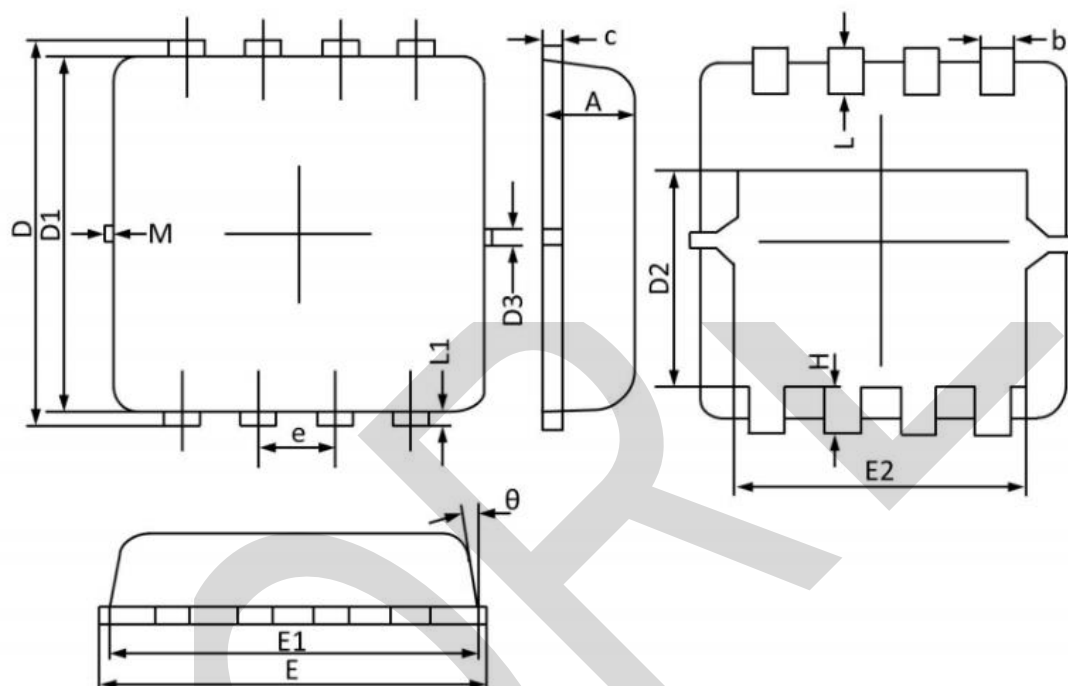


Fig11. Unclamped Inductive Test Circuit and waveforms

PACKAGE OUTLINE DIMENSIONS

Note: unit mm

PDFN3X3 Mechanical Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.70	0.75	0.80	b	0.25	0.30	0.35
C	0.10	0.15	0.25	D	3.25	3.35	3.45
D1	3.00	3.10	3.20	D2	1.78	1.88	1.98
D3	--	0.13	--	E	3.20	3.30	3.40
E1	3.00	3.15	3.20	E2	2.39	2.49	2.59
e	0.65BSC			H	0.30	0.39	0.50
L	0.30	0.40	0.50	L1	--	0.13	--
θ	--	10°	12°	M	*	*	0.15