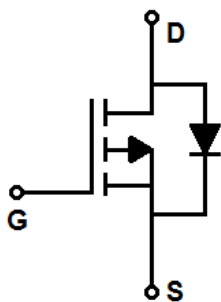
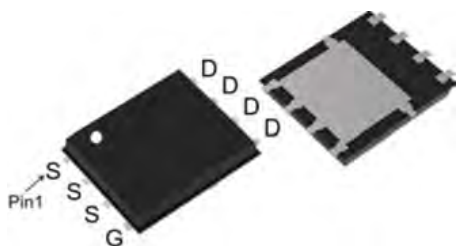


Trench P-channel Power MOSFET

MSR016P03D33
PDFN3*3



V_{DS}	-30	V
$R_{DS(on),TYP@ V_{GS}=10\text{ V}}$	13	mΩ
I_D	-30	A

Features

- 1、Low on – resistance
- 2、Package PDFN3*3
- 3、Trench P-channel Power MOSFET
- 4、Halogen free

Applications

- 1、Load Switch for Portable Devices
- 2、DC/DC Converter

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

Symbol	Parameter		Rating	Unit
V(BR)DSS	Drain-Source breakdown voltage		-30	V
VGS	Gate-Source voltage		±20	V
ID	Continuous drain current @VGS=10V	Tc=25°C	-30	A
		Tc=70°C	-24	A
IDM	Pulse drain current tested ①	Tc=25°C	-120	A
EAS	Avalanche energy, single pulsed ②		93.7	mJ
PD	Maximum power dissipation	Tc=25°C	25	W
		Tc=70°C	16	W
TSTG,TJ	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	5.0	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	60	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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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	V _{DS} =-30V, 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	-1.5	-2.5	V
R _{DS(on)}	Drain-Source On-State Resistance ④	V _{GS} =-10V, I _D =-10A	--	13	16	mΩ
		V _{GS} =-4.5V, I _D =-8A	--	19	25	mΩ

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

C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V , f=1MHz	--	1580	--	pF
C _{oss}	Output Capacitance		--	240	--	pF
C _{rss}	Reverse Transfer Capacitance		--	190	--	pF
Q _g (10V)	Total Gate Charge	V _{DS} =-15V, I _D =-8A , V _{GS} =-4.5V	--	14.6	--	nC
Q _{gs}	Gate-Source Charge		--	4.1	--	nC
Q _{gd}	Gate-Drain Charge		--	6.3	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DS} =-15V, V _{GS} =-10V, R _G =6.0Ω, I _D =-1A	--	9	--	ns
Tr	Turn-on Rise Time		--	21.8	--	ns
Td(off)	Turn-Off Delay Time		--	60	--	ns
Tf	Turn-Off Fall Time		--	14.5	--	ns

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

I _{SD}	Source drain current(Body Diode)	T _A =25°C	—	—	-30	A
V _{SD}	Forward on voltage	I _{SD} =-10A, V _{GS} =0V	--	-0.84	-1.2	V

NOTE: ① Repetitive rating; pulse width limited by max junction temperature.

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.3mH, R_G = 25Ω, I_{AS} = -25A, V_{GS} = -10V. Part not recommended for use above this value

③ The power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150°C.

④ Pulse width ≤ 380μs; duty cycle ≤ 2%.

Typical Characteristics

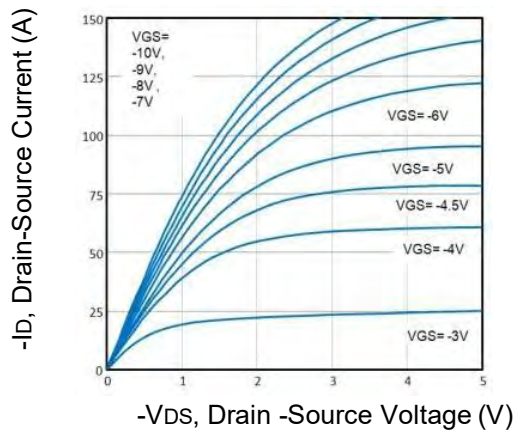


Fig1. Typical Output Characteristics

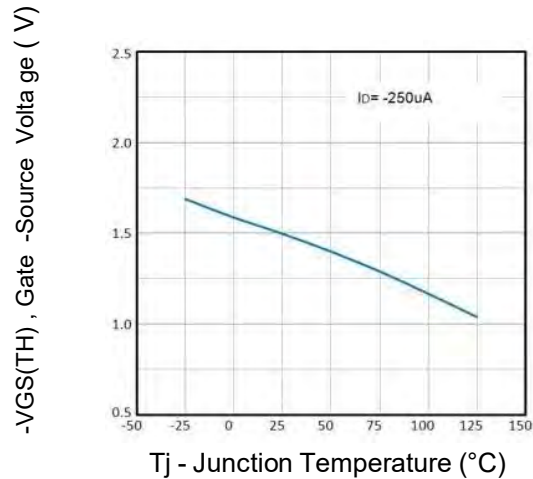


Fig2. Normalized Threshold Voltage Vs. Temperature

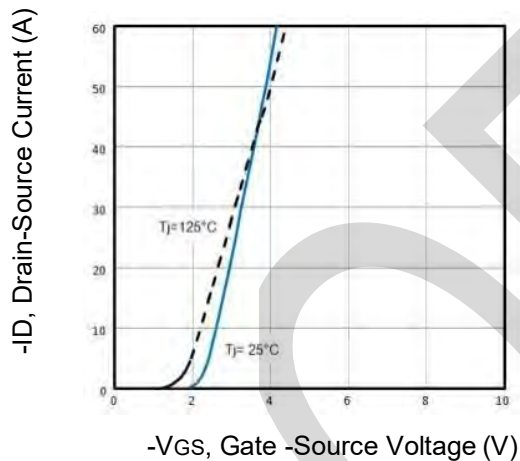


Fig3. Typical Transfer Characteristics

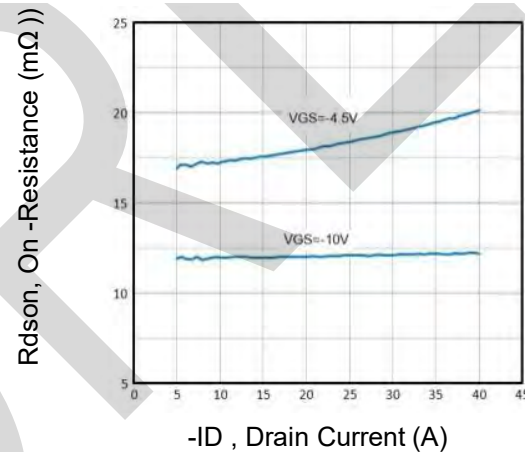


Fig4. On-Resistance vs. Drain Current and Gate

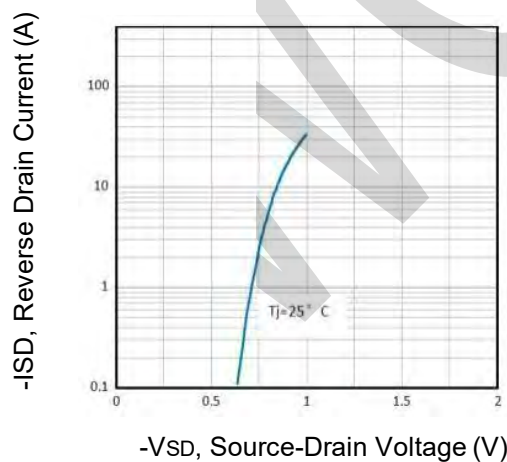


Fig5. Typical Source-Drain Diode Forward Voltage

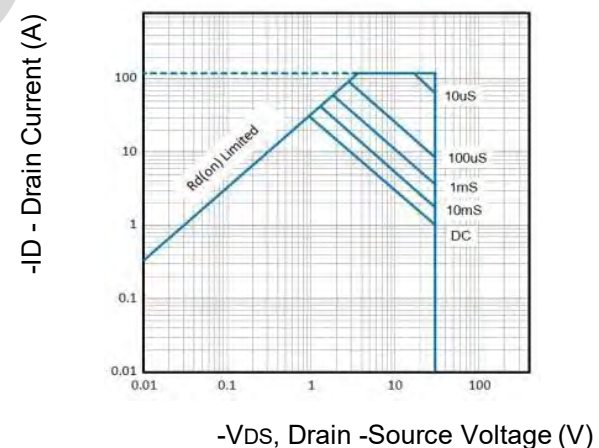


Fig6. Maximum Safe Operating Area

Typical Characteristics

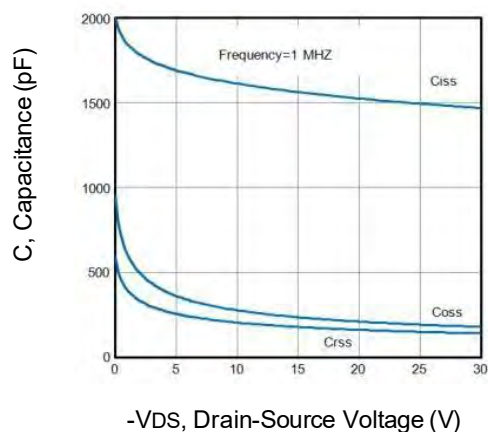


Fig7. Typical Capacitance Vs. Drain-Source Voltage

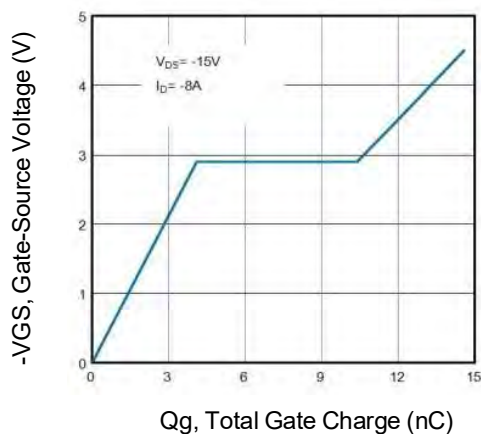


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

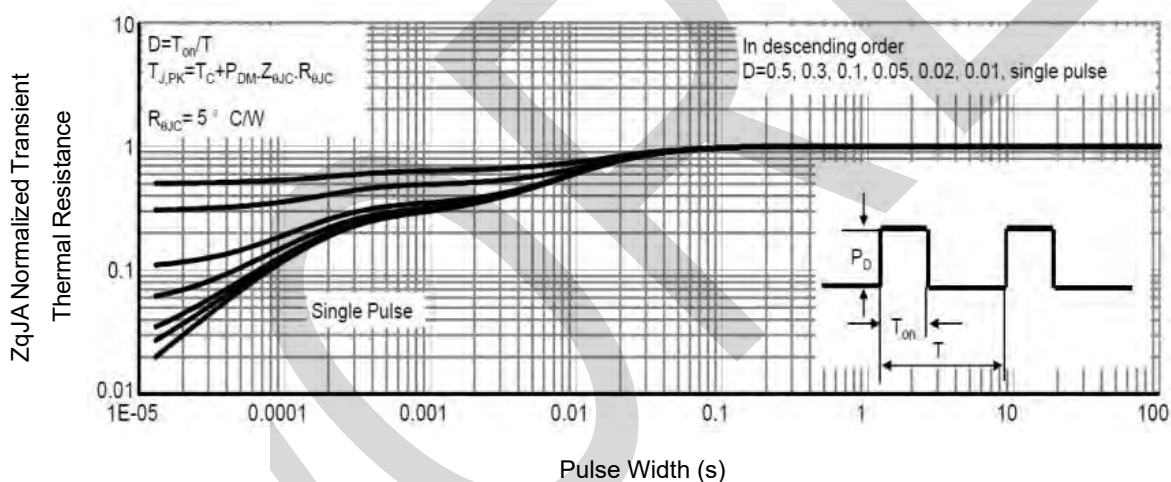


Fig9. Normalized Maximum Transient Thermal Impedance

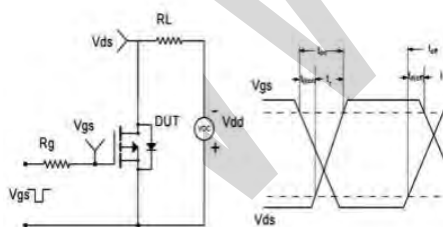


Fig10. Switching Time Test Circuit and waveforms

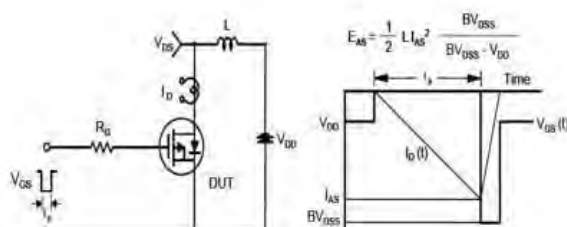
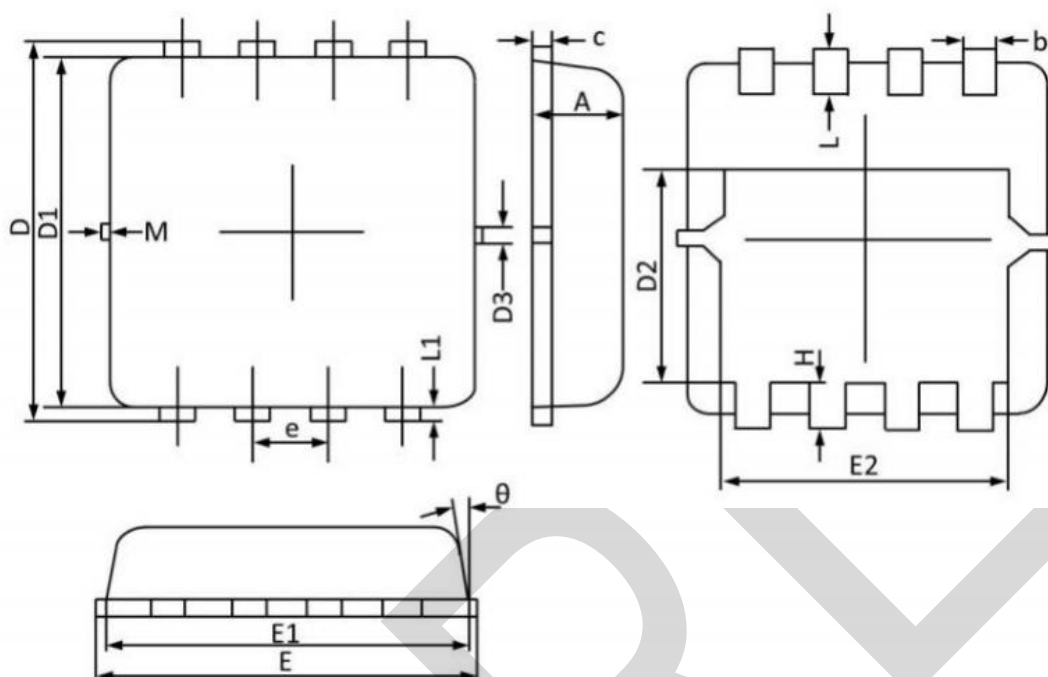


Fig11. Unclamped Inductive Test Circuit and waveforms

PACKAGE OUTLINE DIMENSIONS



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