

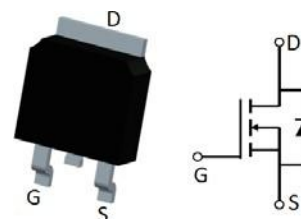
Features

- N-Channel, Low $R_{DS(on)}$ @ $V_{GS}=10V$
- 10V Logic Level Control
- 100% UIS Tested
- Pb-Free, RoHS Compliant

$V_{(BR)DSS}$	$R_{DS(ON)}$ Typ	I_D Max
100V	85mΩ @ 10V	15A
	100mΩ @ 5V	

Applications

- Primary Side Switch
- Load Switch
- Optimized for Power Management Applications for Portable Products, such as H-bridge, Inverters Car Charger and Others



TO-252

Order Information

Product	Package	Marking	Packing	Min Unit Quantity
MS15N10	TO-252	15N10	2500PCS/Reel	5000PCS

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
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Common Ratings (T_J=25°C Unless Otherwise Noted)

V_{GS}	Gate-Source Voltage	±20	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	100	V
T_J	Maximum Junction Temperature	175	°C
T_{STG}	Storage Temperature Range	-50 to 150	°C

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested①	$T_C=25^{\circ}C$	35	A
I_S	Diode continuous forward current	$T_C=25^{\circ}C$	15	A
I_D	Continuous Drain Current($V_{GS}=10V$)	$T_C=25^{\circ}C$	15	A
		$T_C=70^{\circ}C$	12	
P_D	Maximum Power Dissipation	$T_C=25^{\circ}C$	50	W
EAS	Avalanche energy, single pulsed ②		21.6	mJ
$R_{\theta JC}$	Thermal Resistance-Junction to Case		3	°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	100	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _C =25°C)	V _{DS} =100V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _C =125°C)	V _{DS} =80V, 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	1.0	1.6	2.1	V
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =10V, I _D =15A	--	85	98	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =5V, I _D =12A	--	100	115	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	--	605	--	pF
C _{oss}	Output Capacitance		--	33	--	pF
C _{rss}	Reverse Transfer Capacitance		--	27	--	pF
R _g	Gate Resistance	f=1MHz		6.5		Ω
Q _g	Total Gate Charge	V _{DS} =50V I _D =5A, V _{GS} =10V	--	16.1	--	nC
Q _{gs}	Gate Source Charge		--	1.6	--	nC
Q _{gd}	Gate Drain Charge		--	4.8	--	nC
Switching Characteristics @ T _J = 25°C (unless otherwise stated)						
t _{d(on)}	Turn on Delay Time	V _{DD} =25V, I _D =8A, R _G =1Ω, V _{GS} =10V	--	14.2	--	ns
t _r	Turn on Rise Time		--	34	--	ns
t _{d(off)}	Turn Off Delay Time		-	40.4	--	ns
t _f	Turn Off Fall Time		--	6	--	ns
Source Drain Diode Characteristics @ T _J = 25°C (unless otherwise stated)						
t _{rr}	Reverse Recovery Time	I _{SD} =5A, V _{GS} =0V di/dt=100A/μs	--	35	--	nS
Q _{rr}	Reverse Recovery Charge		--	121	--	nC
V _{SD}	Forward on voltage②	I _{SD} =12A, V _{GS} =0V	--	0.93	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, R_G = 25Ω, I_{AS} = 12A, V_{GS} = 10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycles ≤ 2%.

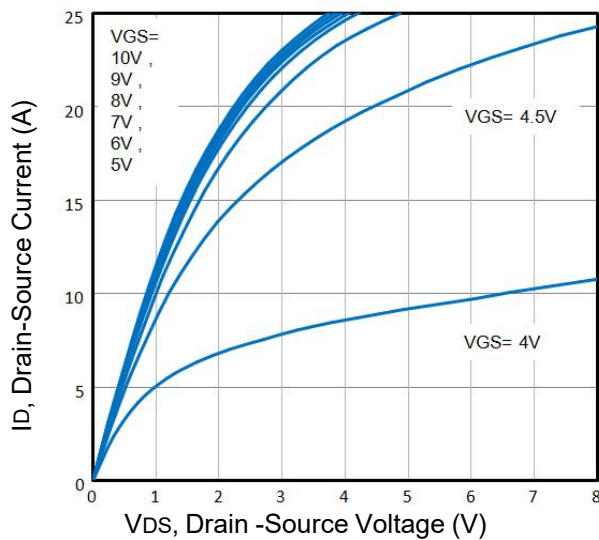


Fig1. Typical Output Characteristics

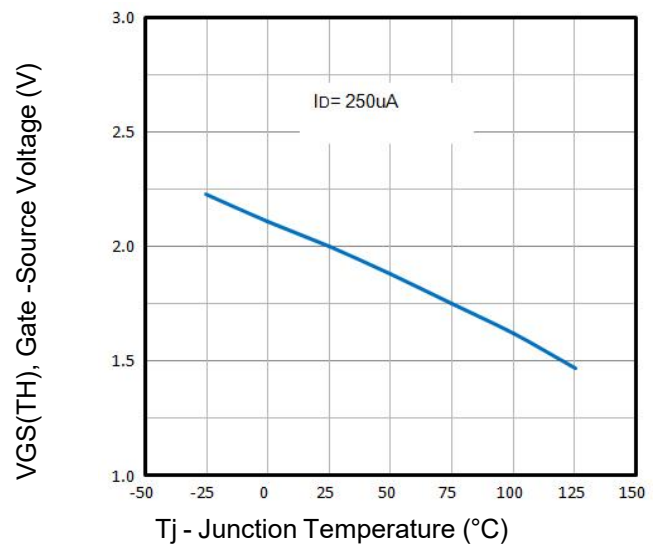


Fig2. VGS(TH) Voltage Vs. Temperature

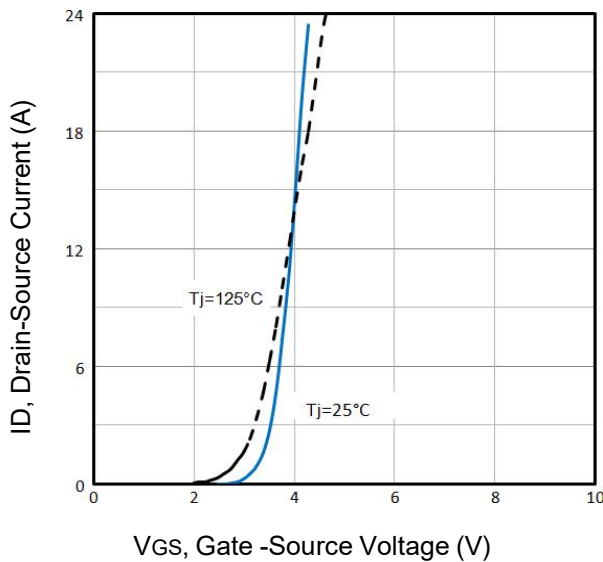


Fig3. Typical Transfer Characteristics

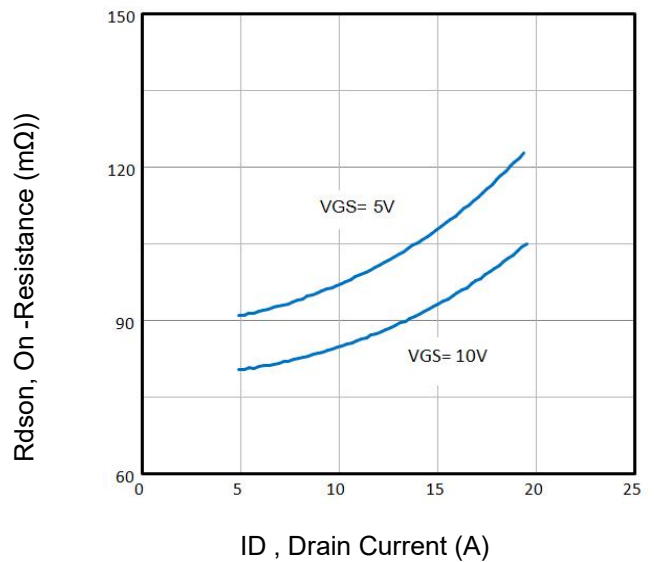


Fig4. On-Resistance vs. Drain Current and Gate Voltage

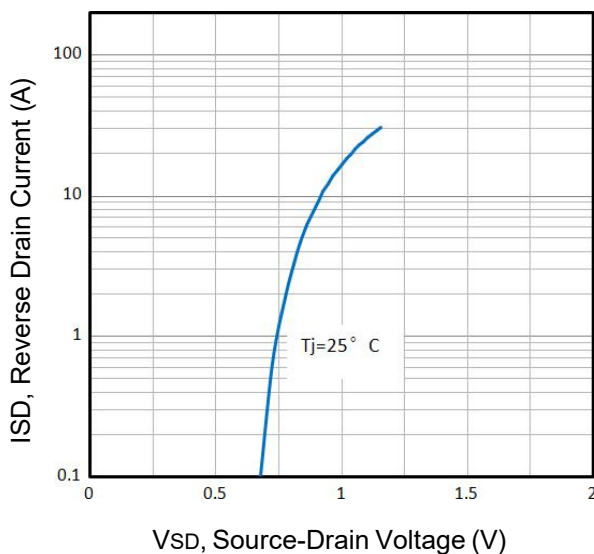


Fig5. Typical Source-Drain Diode Forward Voltage

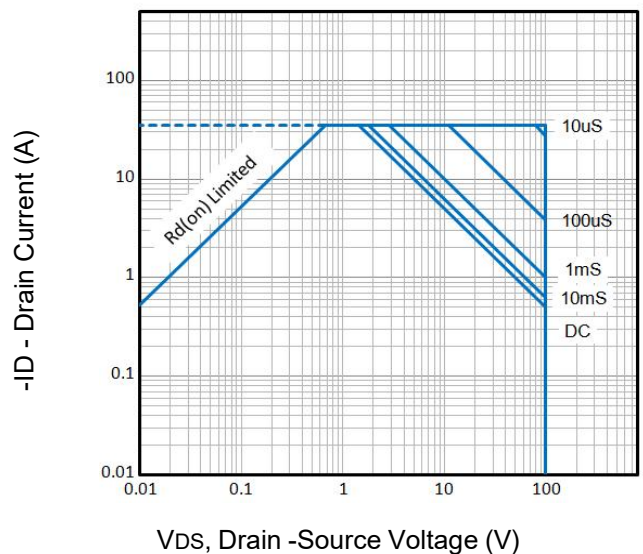


Fig6. Maximum Safe Operating Area

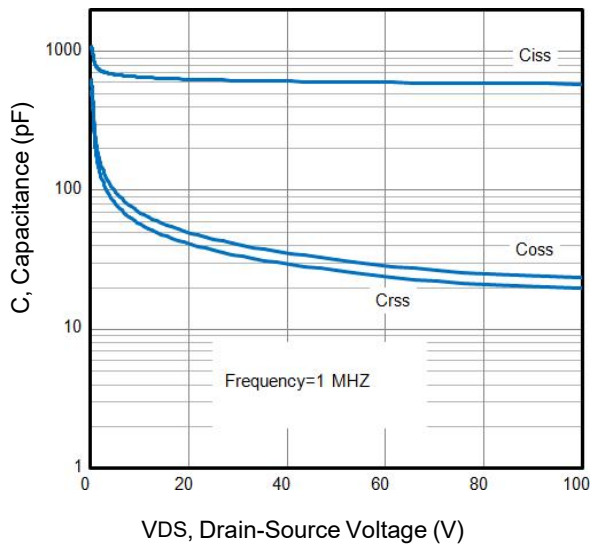


Fig7. Typical Capacitance Vs. Drain-Source Voltage

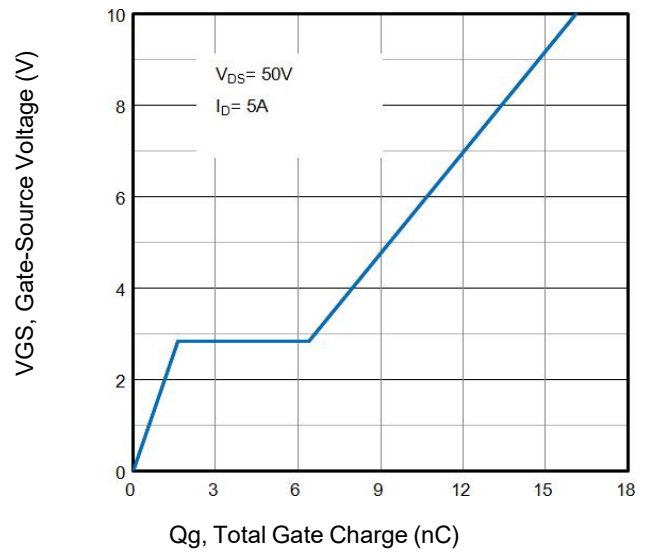


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

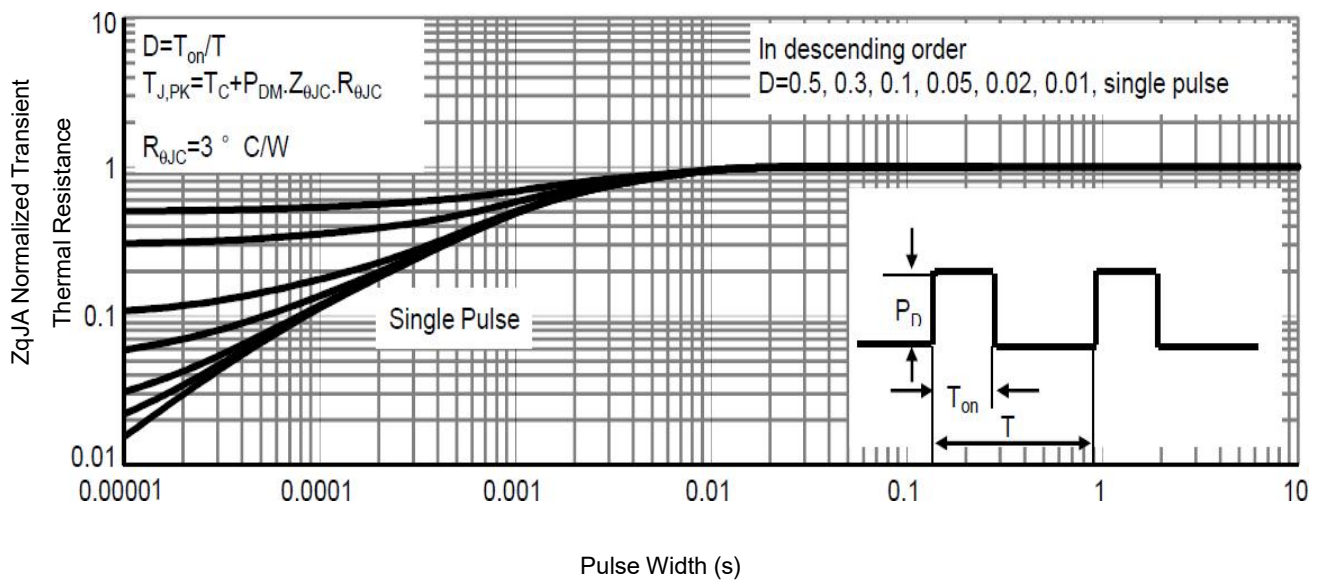


Fig9. Normalized Maximum Transient Thermal Impedance

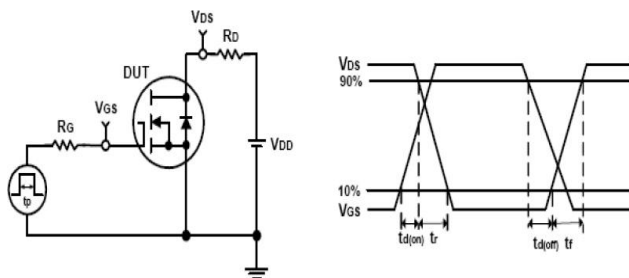


Fig10. Switching Time Test Circuit and waveforms

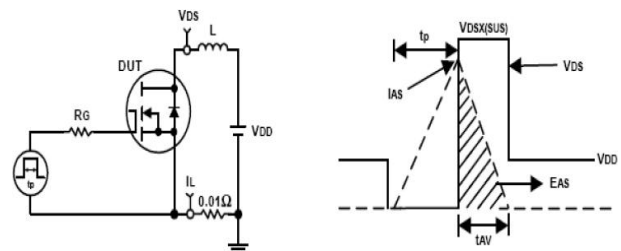
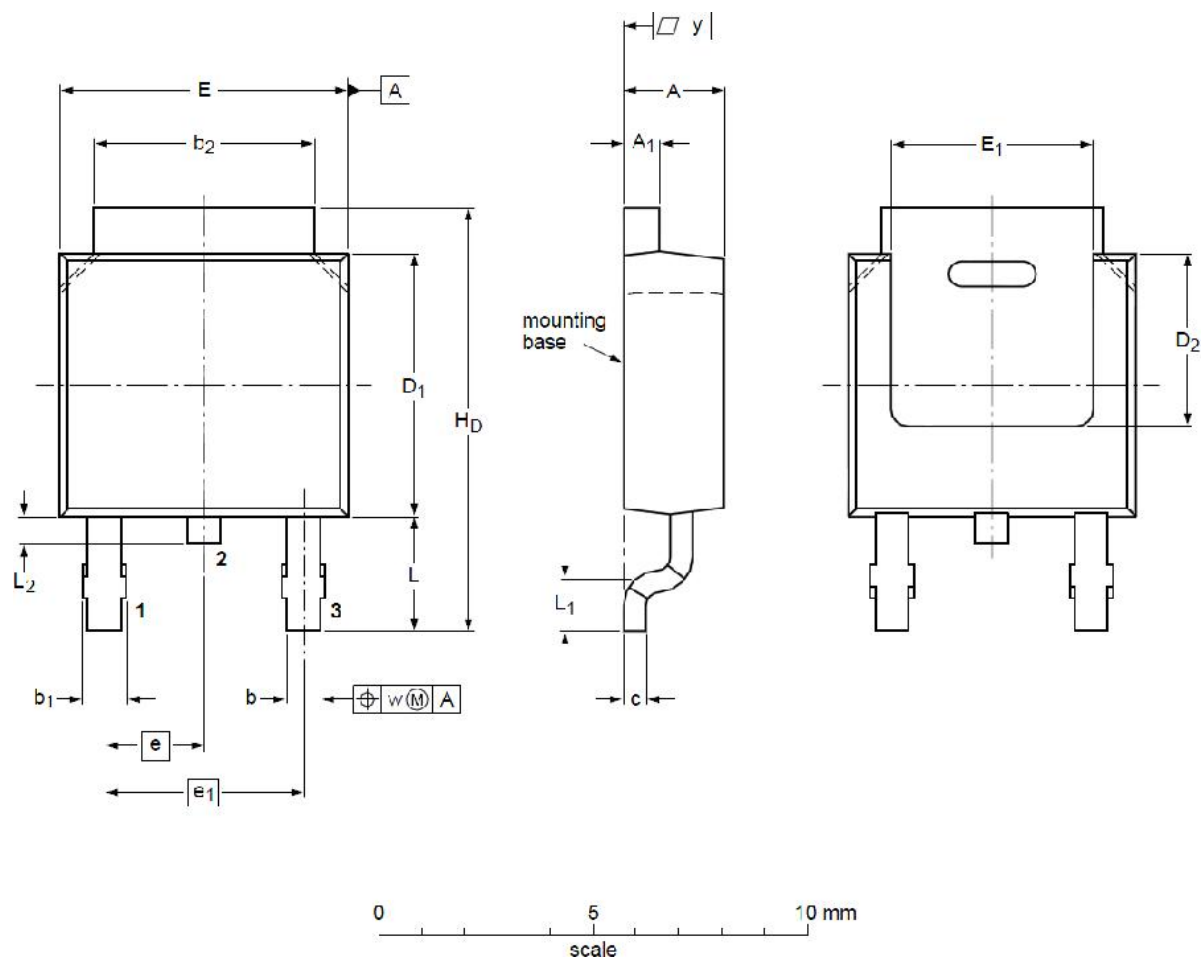


Fig11. Unclamped Inductive Test Circuit and waveforms



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	2.22	2.30	2.38	A ₁	0.4	0.53	0.65
b	0.68	0.78	0.89	b ₁	0.90	0.98	1.10
b ₂	5.20	5.33	5.55	c	0.45	0.5	0.55
D ₁	5.98	6.10	6.22	D ₂	--	4.00	--
E	6.47	6.60	6.73	E ₁	5.10	5.28	5.45
e	--	2.28	--	e ₁	--	4.57	--
H _D	9.60	10.08	10.40	L	2.75	2.95	3.05
L ₁	--	0.50	--	L ₂	0.50	--	1.10
w	--	0.20	--	y	0.20	--	--