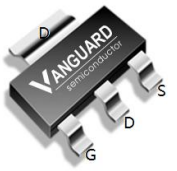
Features

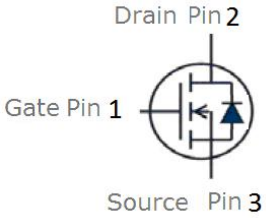
- N-Channel，5V Logic Level Control
- Enhancement mode
- Low on-resistance @ V_{GS}=4.5 V
- Fast Switching
- Pb-free lead plating; RoHS compliant

V_{DS}	150	V
$R_{DS(on),typ@VGS=10V}$	230	mΩ
$R_{DS(on),typ@VGS=4.5V}$	235	mΩ
I_D	3	A

SOT223



Pb-Free RoHS HF Halogen-Free



Part ID	Package Type	Marking	Tape and reel information
VSZ280N15MS	SOT223	280N15M	2500pcs/reel

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

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		150	V
VGS	Gate-Source voltage		±20	V
I_D	Continuous drain current@VGS=10V	T_A=25°C	3	A
		T_A=100°C	1.9	A
I_{DM}	Pulse drain current tested ①	T_A=25°C	12	A
P_D	Maximum power dissipation	T_A=25°C	4.1	W
I_S	Diode Continuous Forward Current	T_A=25°C	3	A
T_{STG} T_J	Storage and operating temperature range①		-55 to 150	°C
Thermal characteristics				
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		30	°C/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		15	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ③		9	mJ

Typical Electrical Characteristics

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	150	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	V_{DS}=150V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	V_{DS}=150V,V_{GS}=0V	--	--	100	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	2.0	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=10V, I_D=3A	--	230	280	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=4.5V, I_D=2A	--	235	300	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=30V,V_{GS}=0V, f=1MHz	--	560	--	pF
C_{oss}	Output Capacitance		--	30	--	pF
C_{rss}	Reverse Transfer Capacitance		--	25	--	pF
Q_g	Total Gate Charge	V_{DS}=75V,I_D=3A, V_{GS}=10V	--	19	--	nC
Q_{gs}	Gate-Source Charge		--	5	--	nC
Q_{gd}	Gate-Drain Charge		--	5.2	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=75V, I_D=1A, R_G=6.8Ω, V_{GS}=4.5V	--	12	--	nS
t_r	Turn-on Rise Time		--	6	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	15.5	--	nS
t_f	Turn-Off Fall Time		--	4.5	--	nS
Source- Drain Diode Characteristics@ T_J = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=3A,V_{GS}=0V	--	0.81	1.2	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=2A, V_{GS}=0V di/dt=100A/μs	--	21	--	nS
Q_{rr}	Reverse Recovery Charge			28		nC

NOTE:

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

② Pulse width ≤ 300μs; duty cycle≤ 2%.

③ Limited by TJmax, starting TJ = 25°C, L = 0.5mH,RG = 25Ω, IAS = 6A VGS =10V. Part not recommended for use above this value

Typical Characteristics

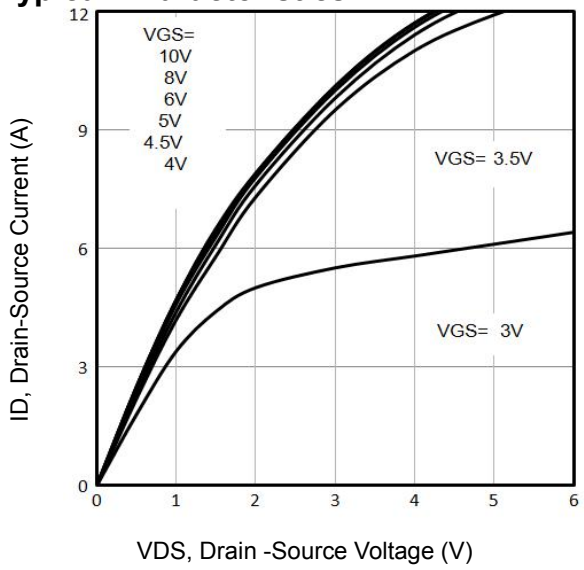


Fig1. Typical Output Characteristics

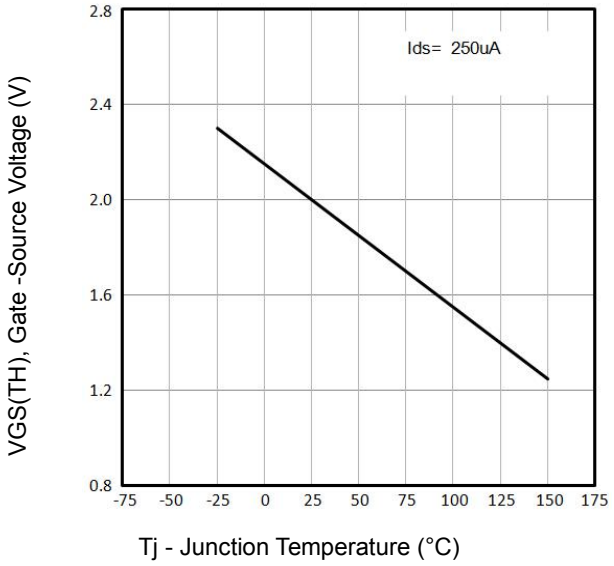


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

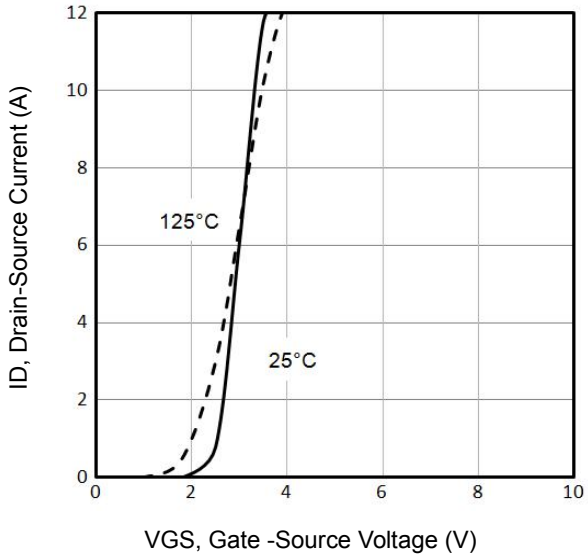


Fig3. Typical Transfer Characteristics

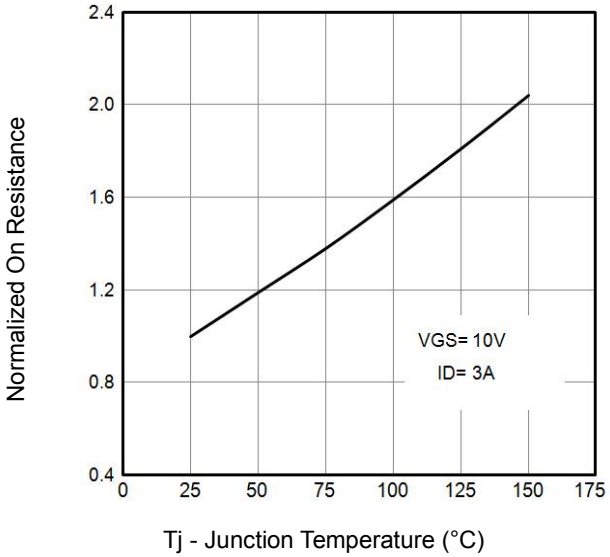


Fig4. Normalized On-Resistance Vs. Tj

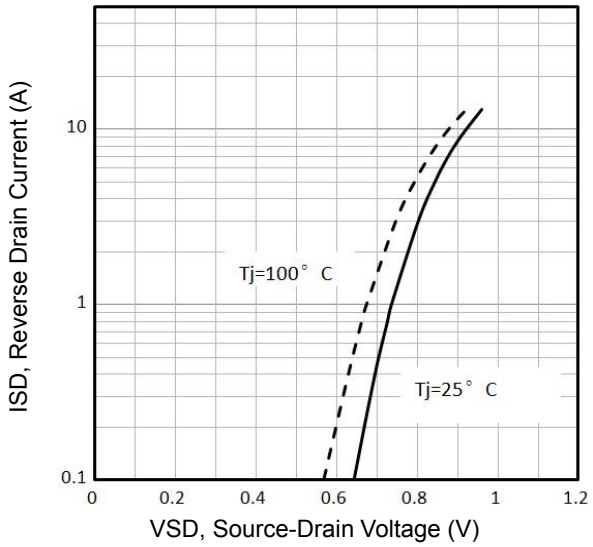


Fig5. Typical Source-Drain Diode Forward Voltage

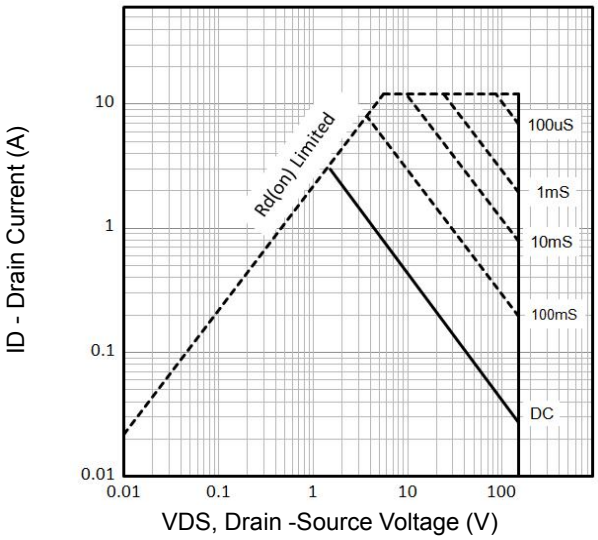


Fig6. Maximum Safe Operating Area

Typical Characteristics

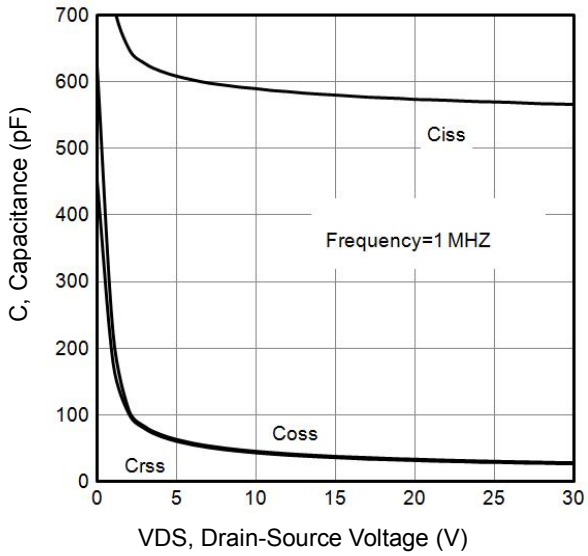


Fig7. Typical Capacitance Vs. Drain-Source Voltage

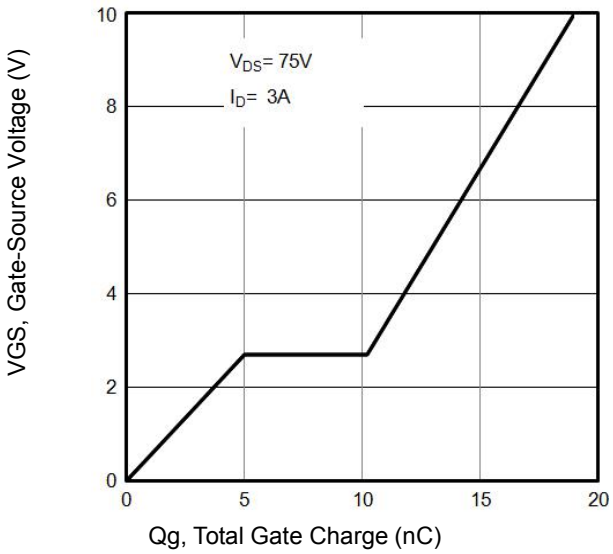


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

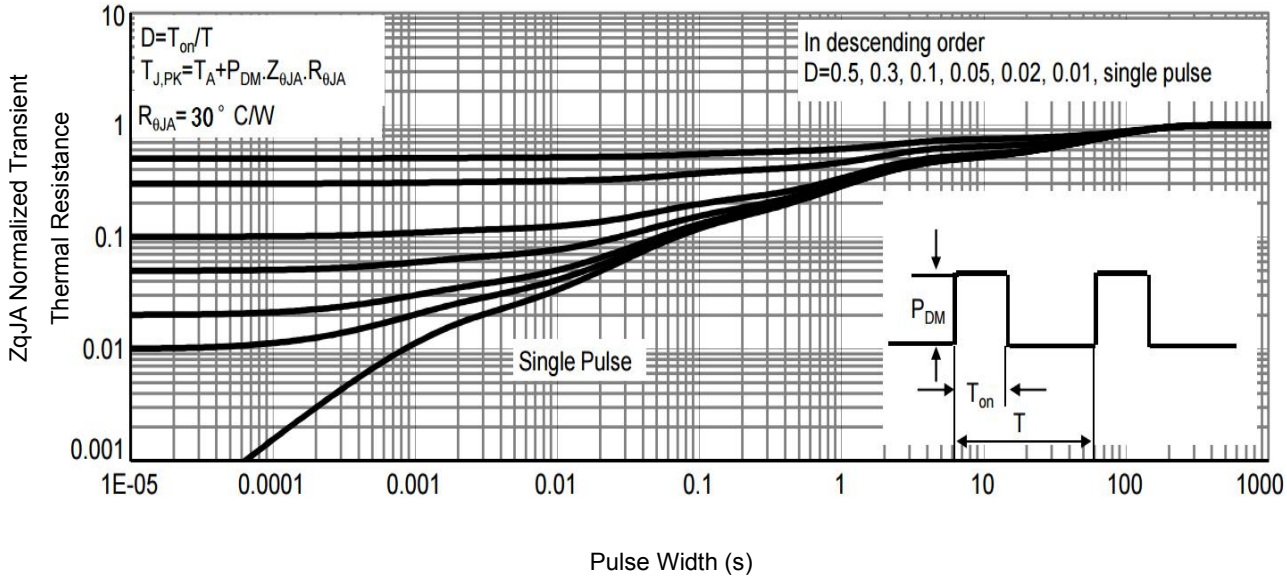


Fig9. Normalized Maximum Transient Thermal Impedance

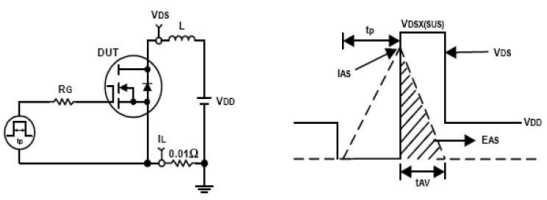


Fig10. Unclamped Inductive Test Circuit and waveforms

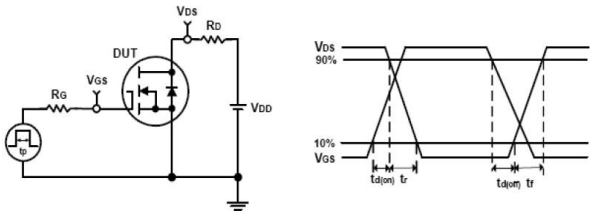
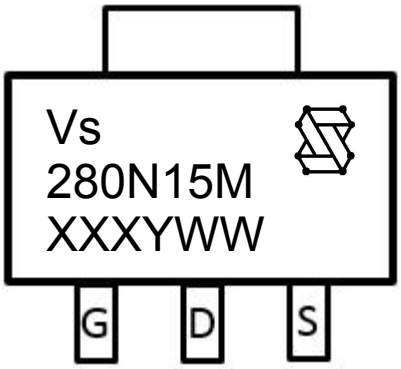


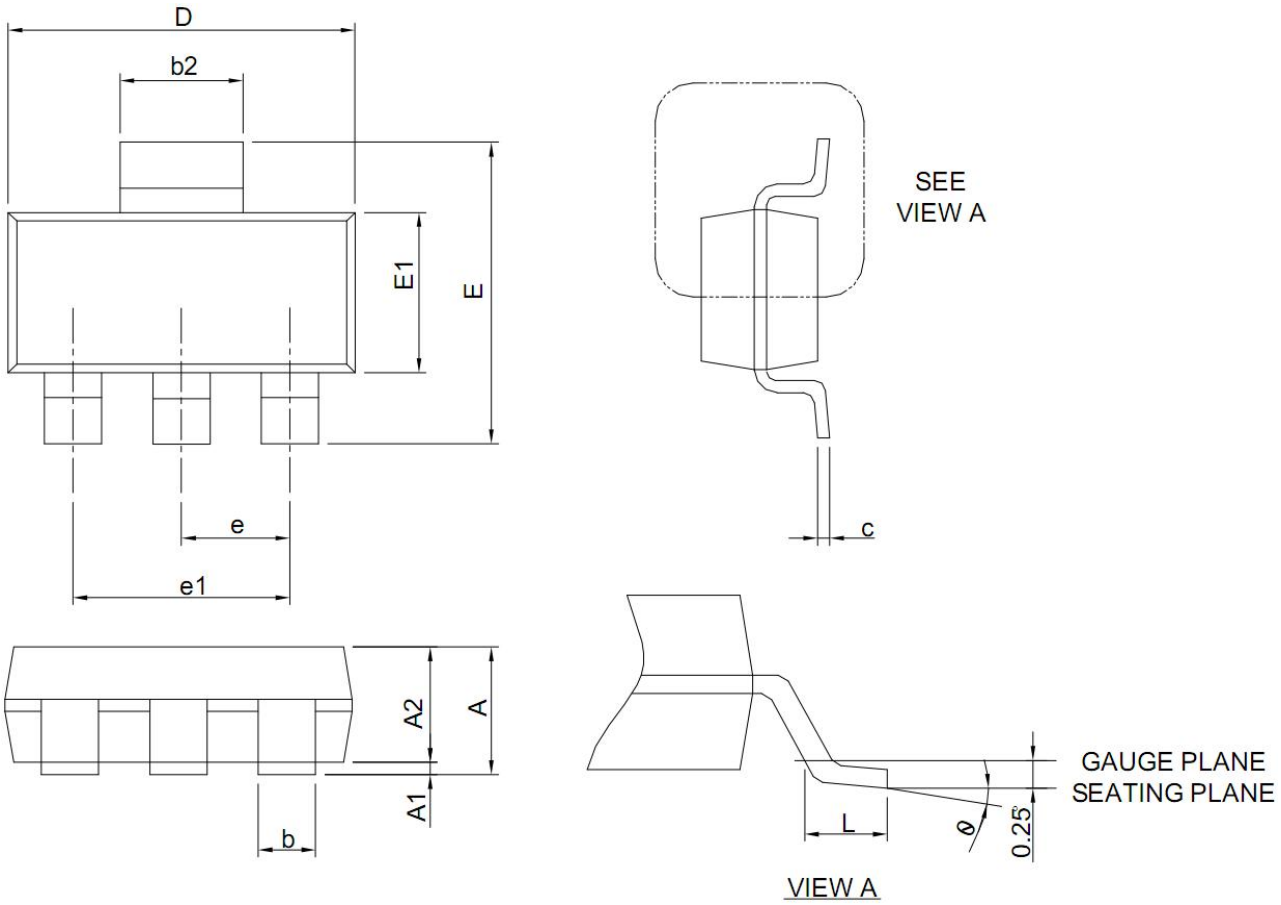
Fig11. Switching Time Test Circuit and waveforms

Marking Information



1st line: Vanguard Code（Vs）， Vanguard Logo
2nd line: Part Number（280N15M）
3rd line: Date code （XXXYWW）
XXX: Wafer Lot Number Code , code changed with Lot Number
Y: Year Code，(e.g. E=2017, F=2018, G=2019, H=2020, etc)
WW: Week Code (01 to 53)

SOT223 Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	1.50	1.65	1.80
A1	0.02	0.06	0.10
A2	1.50	1.60	1.70
b	0.66	0.72	0.80
b2	2.90	3.00	3.10
c	0.23	0.30	0.35
D	6.30	6.50	6.70
E	6.70	7.00	7.30
E1	3.30	3.50	3.70
e	2.30 REF		
e1	4.60 REF		
L	0.75	--	1.15
θ	0 °	--	10 °

Notes:

1. Refer to JEDEC TO-261 variation AA
2. Dimensions "D" and "E1" do NOT include mold flash, tie bar burrs, gate burrs and interlead flash.

Customer Service

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