

Features

- N-Channel, 10V Logic Level Control
- Enhancement mode
- Fast Switching
- Pb-free lead plating; RoHS compliant

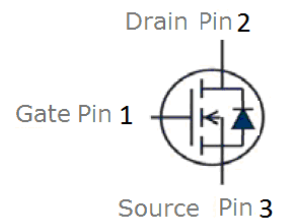
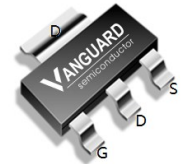
V_{DS}	600	V
$R_{DS(on),TYP}@ V_{GS}=10\text{ V}$	5	Ω
I_D	2	A



Halogen-Free

Part ID	Package Type	Marking	Tape and reel information
VS2N60AZ	SOT223	2N60AZ	2500PCS/Reel

SOT223



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

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage	600	V
V_{GS}	Gate-Source voltage	± 30	V
I_S	Diode continuous forward current	$T_A=25^\circ\text{C}$ 2	A
I_D	Continuous drain current @ $V_{GS}=10\text{V}$	$T_A=25^\circ\text{C}$ 2	A
		$T_A=70^\circ\text{C}$ 1.6	A
I_{DM}	Pulse drain current tested ①	$T_A=25^\circ\text{C}$ 8	A
P_D	Maximum power dissipation	$T_A=25^\circ\text{C}$ 2.5	W
		$T_A=70^\circ\text{C}$ 1.6	W
T_{STG}, T_J	Storage and junction temperature range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JL}$	Thermal Resistance, Junction-to-Lead	15	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	$^\circ\text{C/W}$

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	600	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =600V, V _{GS} =0V	--	--	1	uA
	Zero Gate Voltage Drain Current(T _j =125°C)	V _{DS} =480V, V _{GS} =0V	--	--	50	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±30V, V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2.4	--	3.7	V
R _{DS(ON)}	Drain-Source On-State Resistance ②	V _{GS} =10V, I _D =0.5A	--	5	6.2	Ω
Dynamic Electrical Characteristics @ T _j = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	160	210	260	pF
C _{oss}	Output Capacitance		--	25	--	pF
C _{rss}	Reverse Transfer Capacitance		--	5	--	pF
R _g	Gate Resistance	f=1MHz	--	6.6	--	Ω
Q _g	Total Gate Charge	V _{DS} =480V, I _D =2A, V _{GS} =10V	--	5.4	--	nC
Q _{gs}	Gate-Source Charge		--	2.3	--	nC
Q _{gd}	Gate-Drain Charge		--	1.0	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =300V, I _D =2A, R _G =10Ω, V _{GS} =10V	--	5.8	--	ns
t _r	Turn-on Rise Time		--	6.6	--	ns
t _{d(off)}	Turn-Off Delay Time		--	11	--	ns
t _f	Turn-Off Fall Time		--	45	--	ns
Source- Drain Diode Characteristics@ T _j = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =2A, V _{GS} =0V	--	0.9	1.2	V
t _{rr}	Reverse Recovery Time	T _j =25°C, I _{sd} =2A, V _{GS} =0V	--	210	--	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	--	0.94	--	uC

NOTE:

- ① Repetitive rating; pulse width limited by max junction temperature.
 ② Pulse width $\leq 380\mu s$; duty cycle $\leq 2\%$.



Typical Characteristics

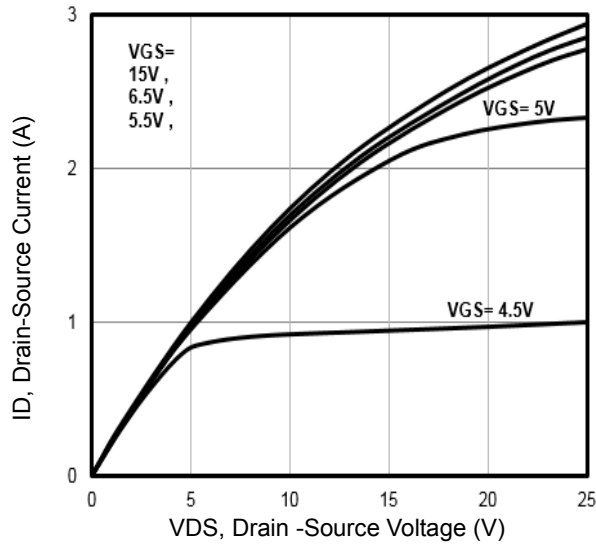


Fig1. Typical Output Characteristics

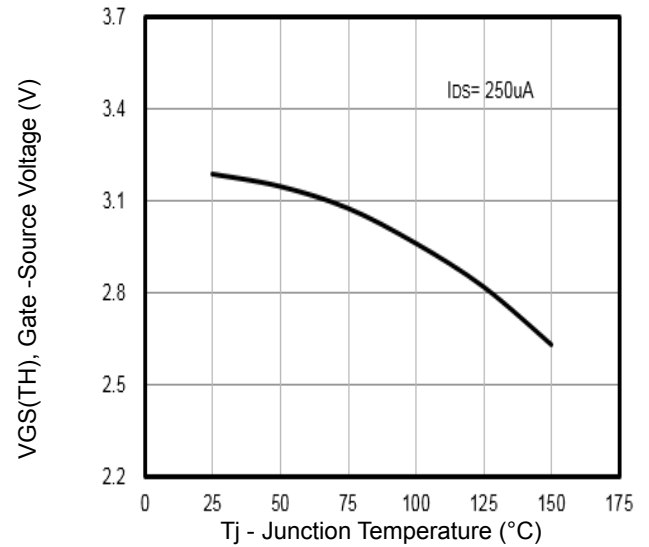


Fig2. $V_{GS(TH)}$ Gate-Source Voltage Vs. T_j

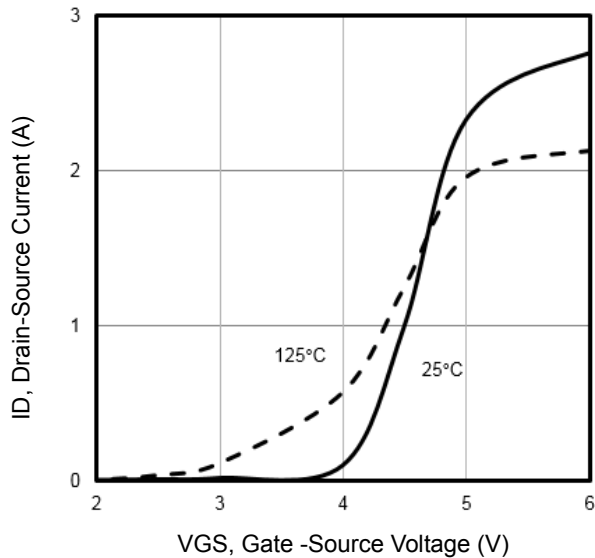


Fig3. Typical Transfer Characteristics

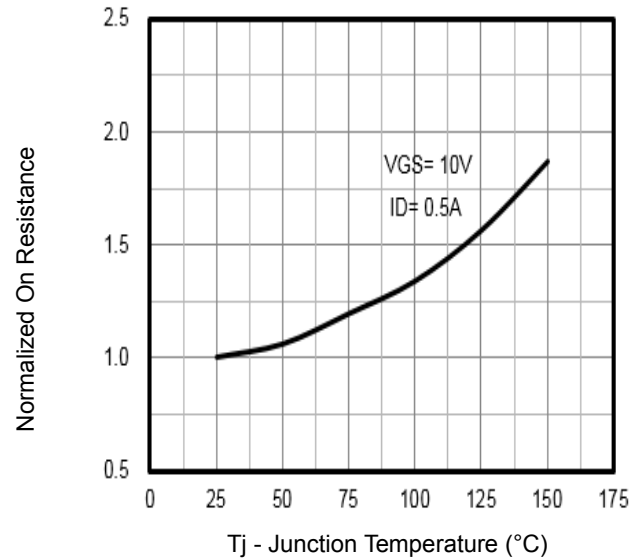


Fig4. Normalized On-Resistance Vs. T_j

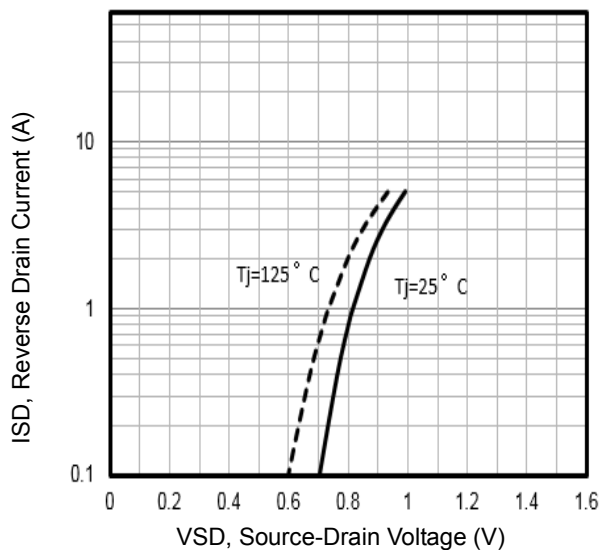


Fig5. Typical Source-Drain Diode Forward Voltage

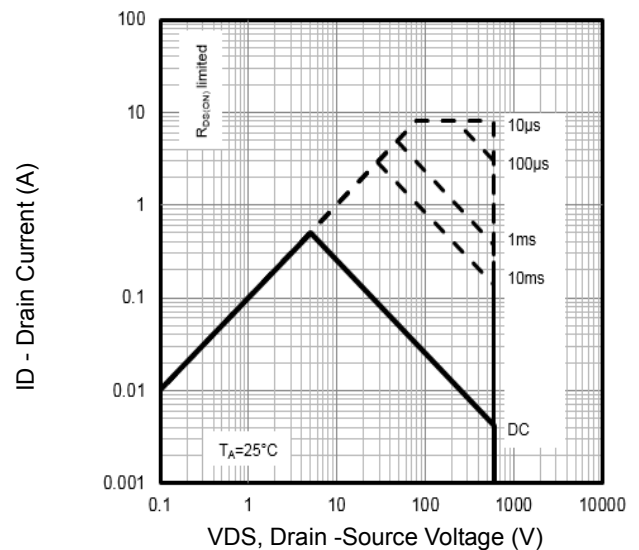


Fig6. Maximum Safe Operating Area

Typical Characteristics

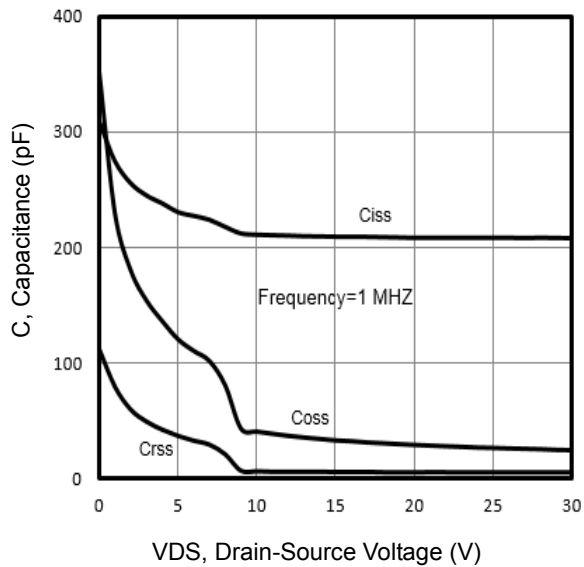


Fig7. Typical Capacitance Vs. Drain-Source Voltage

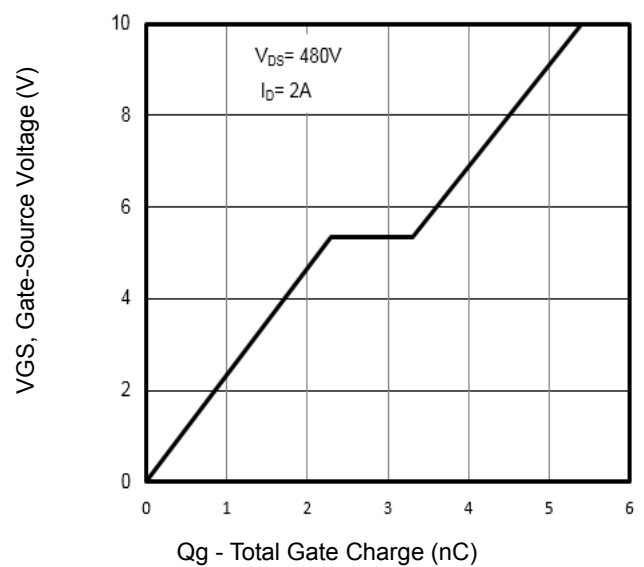


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

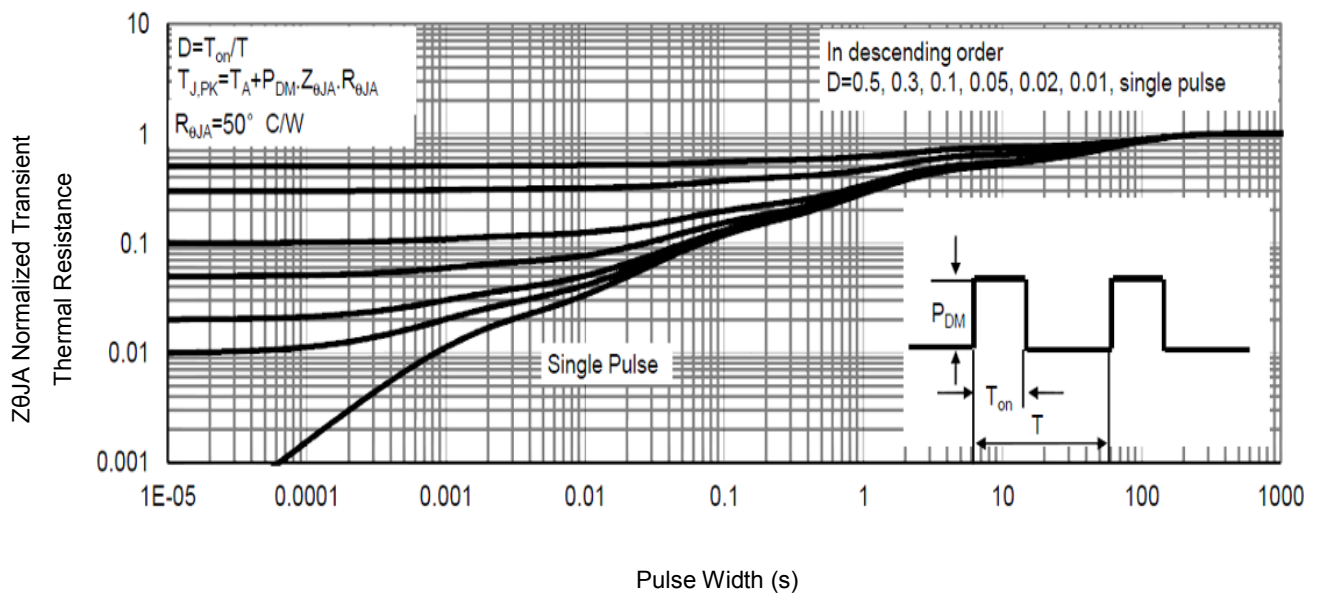


Fig9. Normalized Maximum Transient Thermal Impedance

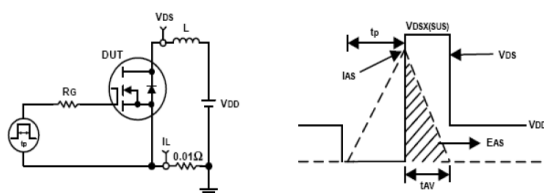


Fig10. Unclamped Inductive Test Circuit and waveforms

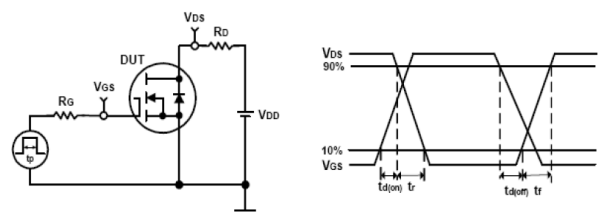
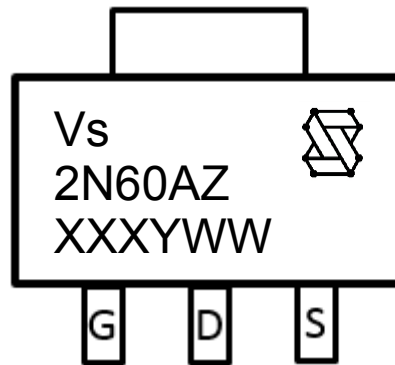
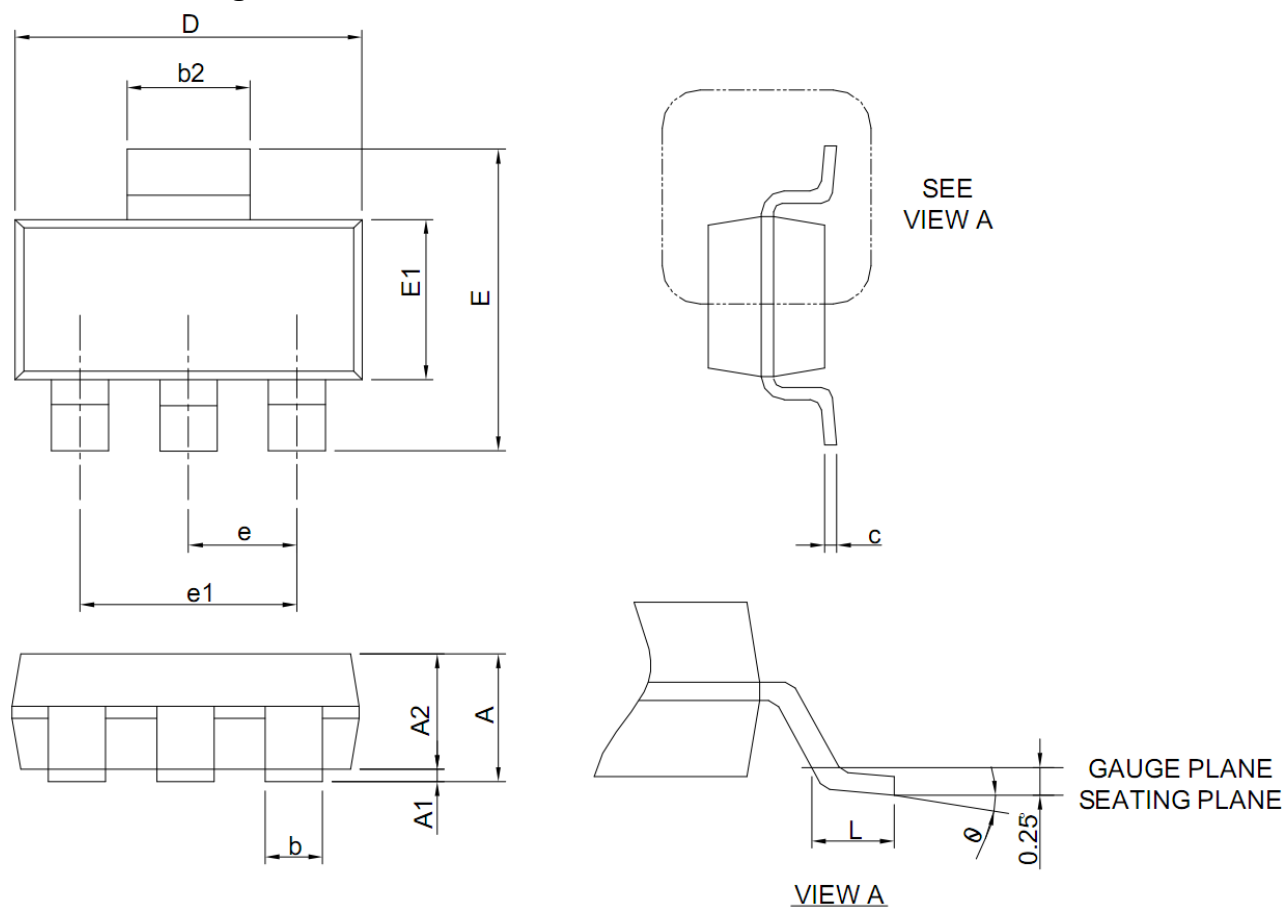


Fig11. Switching Time Test Circuit and waveforms

Marking Information

- 1st line: Vanguard Code (Vs), Vanguard Logo
- 2nd line: Part Number (2N60AZ)
- 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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