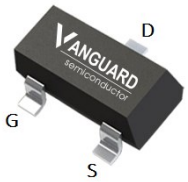
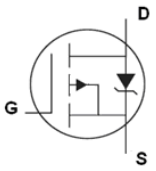
Features

- P-Channel，-2.5V Logic Level Control
- Enhancement mode
- Fast Switching
- Pb-free lead plating; RoHS compliant

V_{DS}	-30	V
$R_{DS(on),TYP}$ @V_{GS}=-4.5V	62	mΩ
$R_{DS(on),TYP}$ @V_{GS}=-2.5V	81	mΩ
I_D	-3.8	A

SOT23-3L





Pb-Free RoHS Halogen-Free

Part ID	Package Type	Marking	Tape and reel information
VS3401AL	SOT23-3L	VS34	3000pcs/reel

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

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		-30	V
I_S	Diode continuous forward current	T_A =25°C	-1.0	A
I_D	Continuous drain current @V_{GS}=-4.5V	T_A =25°C	-3.8	A
		T_A =70°C	-3.0	A
I_{DM}	Pulse drain current tested ①	T_A =25°C	15	A
P_D	Maximum power dissipation	T_A =25°C	1.25	W
V_{GS}	Gate-Source voltage		±12	V
T_{STG} T_J	Storage and operating temperature range		-55 to 150	°C
Thermal Characteristics				
$R_{\theta JL}$	Thermal Resistance，Junction to Lead		60	°C/W
$R_{\theta JA}$	Thermal Resistance，Junction to Ambient		100	°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_j=25℃)	V_{DS}=-30V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T_j=125℃)	V_{DS}=-30V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V,V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-0.5	--	-1.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-10V, I_D=-4A	--	52	60	mΩ
		V_{GS}=-4.5V, I_D=-3A	--	62	70	mΩ
		V_{GS}=-2.5V, I_D=-2A	--	81	105	mΩ
Dynamic Electrical Characteristics @ T_j= 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, f=1MHz	700	805	880	pF
C_{oss}	Output Capacitance		--	60	110	pF
C_{rss}	Reverse Transfer Capacitance		--	45	80	pF
R_g	Gate Resistance	f=1MHz	--	10	--	Ω
Q_g	Total Gate Charge	V_{DS}=-15V,I_D=-3A, V_{GS}=-4.5V	--	10	--	nC
Q_{gs}	Gate-Source Charge		--	2.3	--	nC
Q_{gd}	Gate-Drain Charge		--	4.2	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-15 V, I_D=-3A, R_G=3Ω, V_{GS}=-4.5V	--	4	--	nS
t_r	Turn-on Rise Time		--	4	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	28	--	nS
t_f	Turn-Off Fall Time		--	4.6	--	nS
Source- Drain Diode Characteristics@ T_j= 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=-3A,V_{GS}=0V	--	-0.85	-1.2	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=-3A, V_{GS}=0V di/dt=-100A/μs	--	12	--	nS
Q_{rr}	Reverse Recovery Charge			3.6		nC

NOTE:

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

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

Typical Characteristics

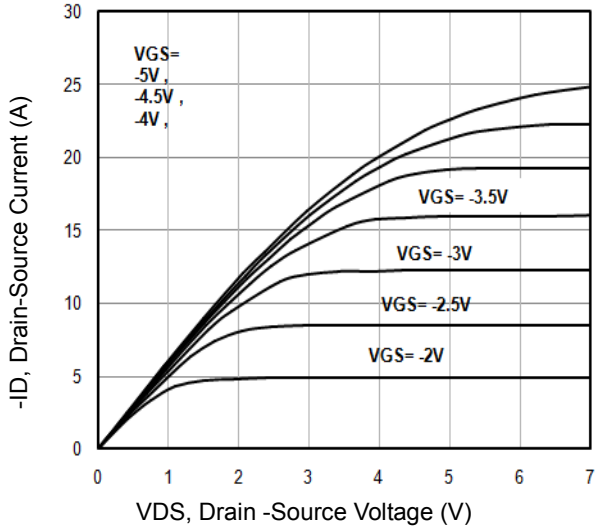


Fig1. Typical Output Characteristics

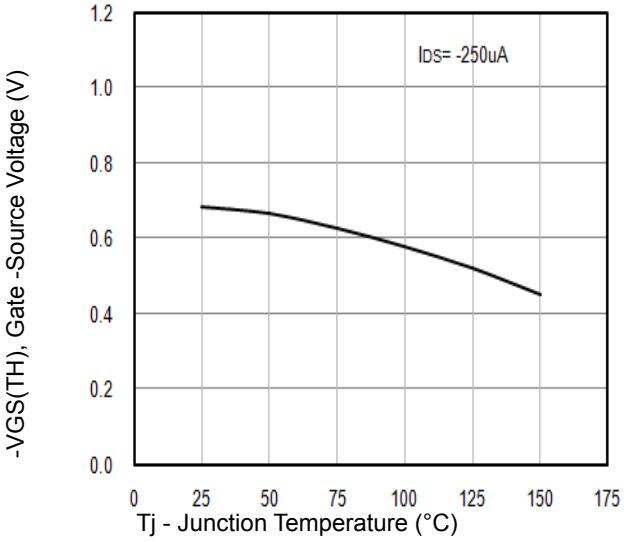


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

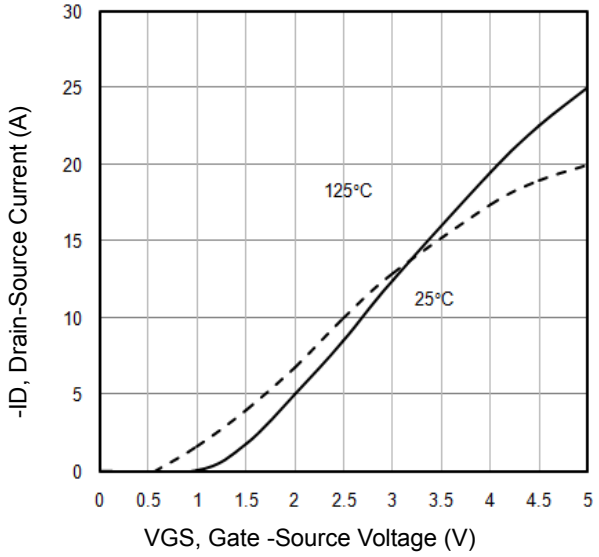


Fig3. Typical Transfer Characteristics

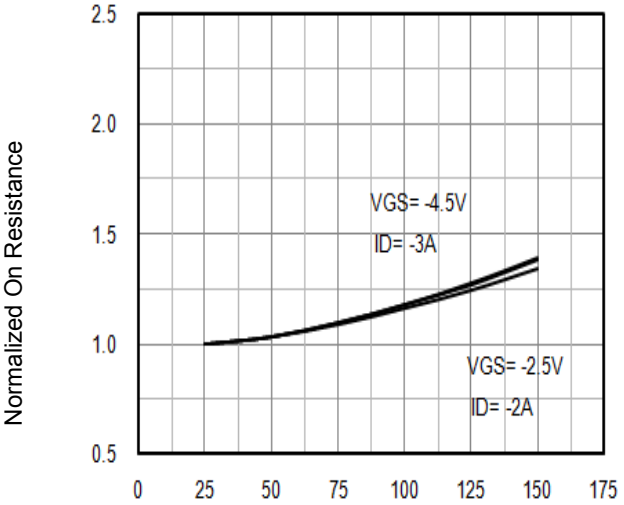


Fig4. Normalized On-Resistance Vs. Tj

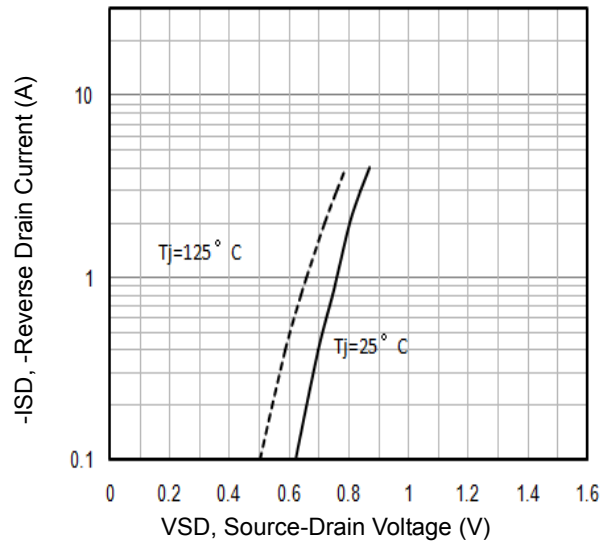


Fig5. Typical Source-Drain Diode Forward Voltage

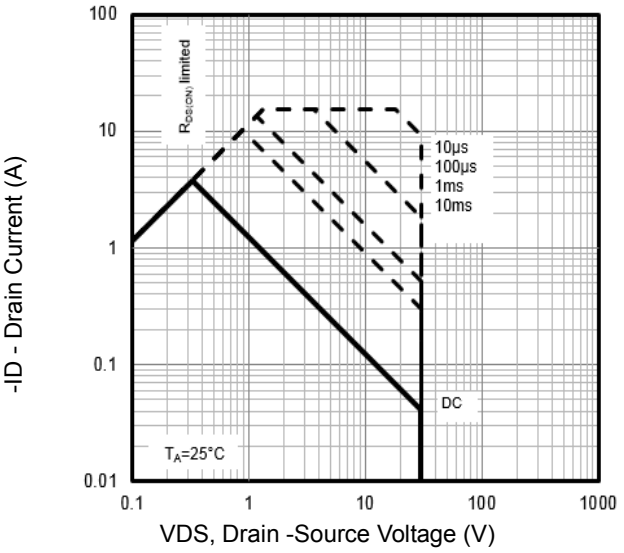


Fig6. Maximum Safe Operating Area

Typical Characteristics

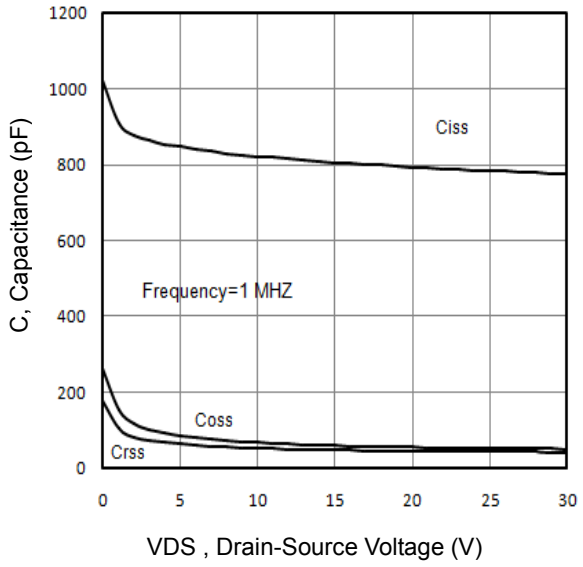


Fig7. Typical Capacitance Vs.Drain-Source Voltage

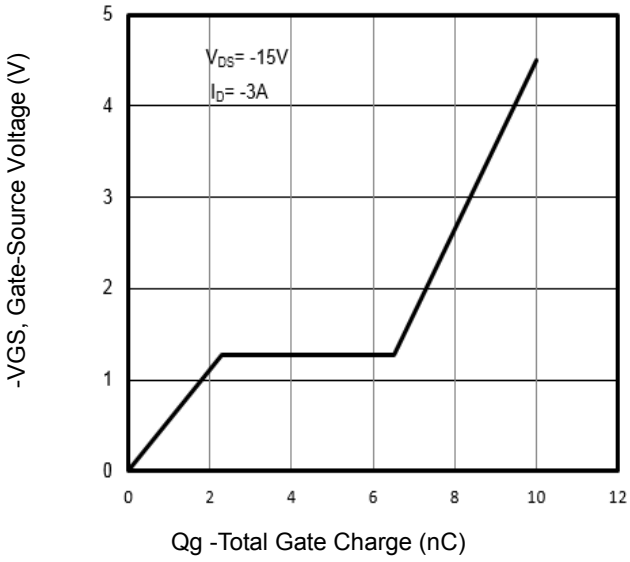


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

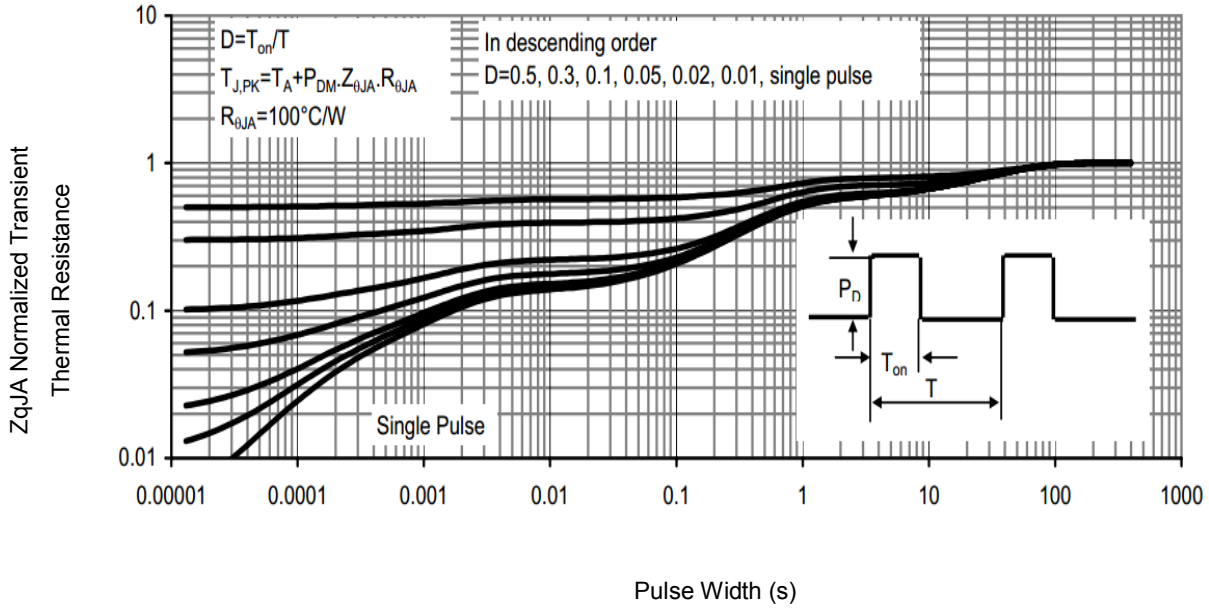


Fig9. Normalized Maximum Transient Thermal Impedance

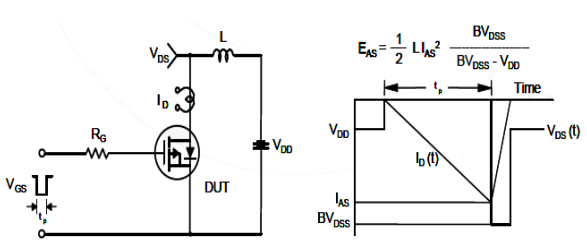


Fig10. Unclamped Inductive Test Circuit and waveforms

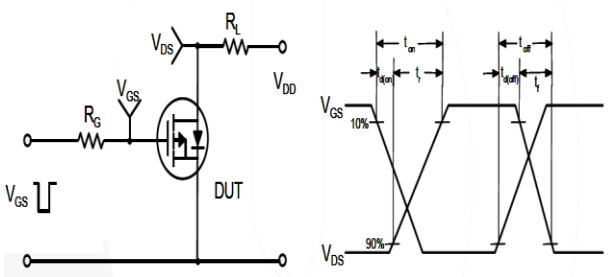
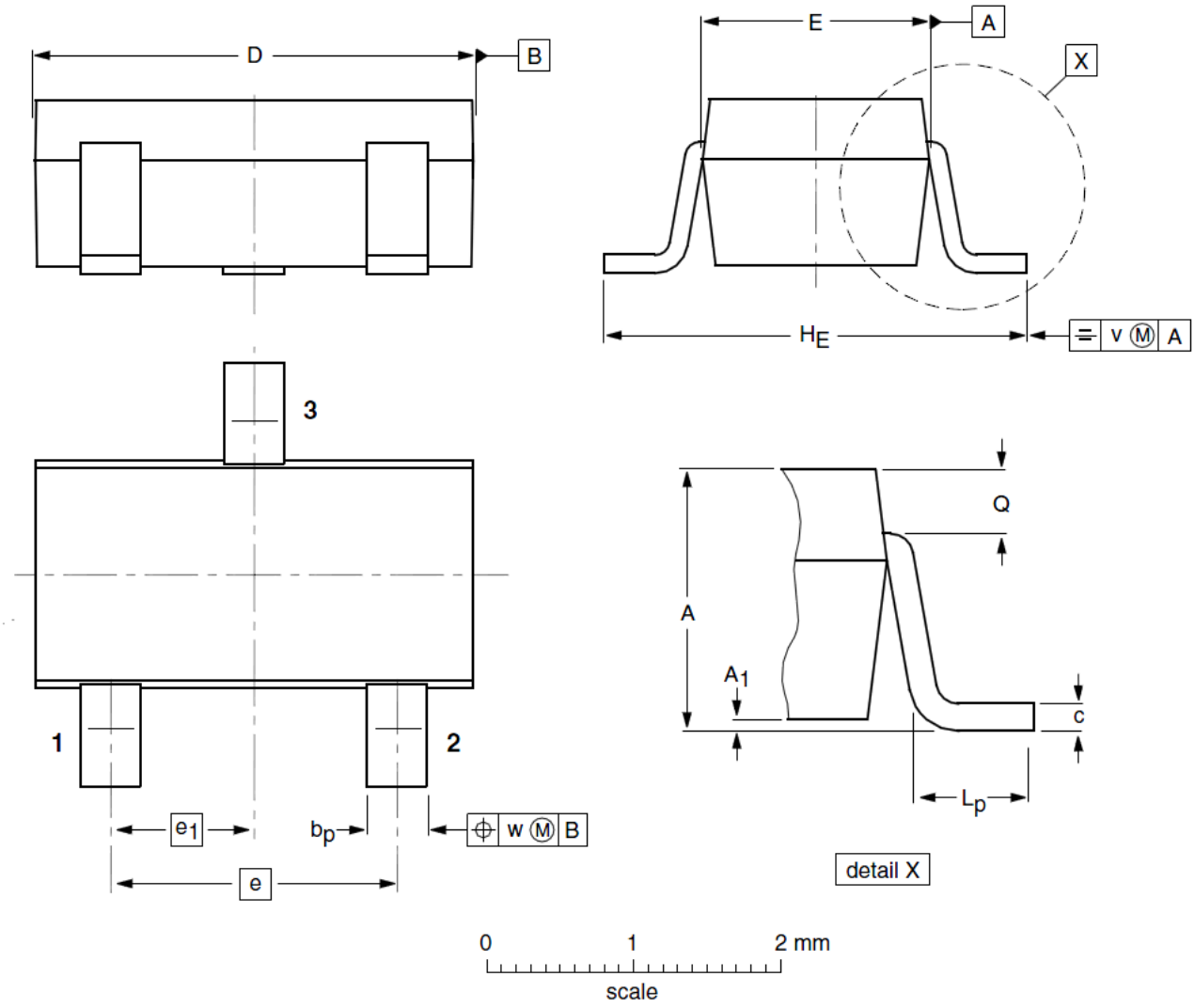


Fig11. Switching Time Test Circuit and waveforms

SOT23-3L Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	0.90	1.07	1.25
A_1	0.01	0.06	0.10
b_p	0.30	0.35	0.50
c	0.10	0.15	0.20
D	2.70	2.92	3.10
E	1.30	1.60	1.70
e	--	1.90	--
e_1	--	0.95	--
H_E	2.50	2.80	3.00
L_p	0.30	0.40	0.60
Q	0.23	0.29	0.33
v	--	0.20	--
w	--	0.20	--

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