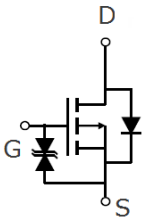
Features

- Enhancement mode
- Fast Switching
- ESD Protection HBM ±400V
- Pb-free lead plating; RoHS compliant

V_{DS}	-20	V
$R_{DS(on),TYP}$ @V_{GS}=-4.5V	60	mΩ
$R_{DS(on),TYP}$ @V_{GS}=-2.5V	85	mΩ
$R_{DS(on),TYP}$ @V_{GS}=-1.8V	125	mΩ
I_D	-3.4	A

Pb-Free RoHS HF Halogen-Free

SOT23



Part ID	Package Type	Marking	Tape and reel information
VS3415AC	SOT23	V25	3000pcs/reel

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

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		-20	V
V_{GS}	Gate-Source voltage		±8	V
I_S	Diode continuous forward current	T_A =25°C	-0.8	A
I_D	Continuous drain current @V_{GS}=-4.5V	T_A =25°C	-3.4	A
		T_A =70°C	-2.7	A
I_{DM}	Pulse drain current tested ①	T_A =25°C	-14	A
P_D	Maximum power dissipation	T_A =25°C	1	W
T_{STG}, T_J	Storage and operating temperature range		-55 to 150	°C
Thermal Characteristics				
$R_{\theta JL}$	Thermal Resistance, Junction-to-Lead		80	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		125	°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	-20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(T_j=25℃)	V_{DS}=-20V,V_{GS}=0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(T_j=125℃)	V_{DS}=-20V,V_{GS}=0V	--	--	-100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±8V,V_{DS}=0V	--	--	±10	μA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.7	-1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ②	V_{GS}=-4.5V, I_D=-5A	--	60	75	mΩ
		V_{GS}=-2.5V, I_D=-3A	--	85	110	mΩ
		V_{GS}=-1.8V, I_D=-1A	--	125	160	mΩ
Dynamic Electrical Characteristics @ T_j= 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=-10V,V_{GS}=0V, f=1MHz	490	575	660	pF
C_{oss}	Output Capacitance		45	55	65	pF
C_{rss}	Reverse Transfer Capacitance		40	50	60	pF
R_g	Gate Resistance	f=1MHz	--	8.5	--	Ω
Q_g	Total Gate Charge	V_{DS}=-10V,I_D=-5A, V_{GS}=-4.5V	--	6.9	--	nC
Q_{gs}	Gate-Source Charge		--	1.3	--	nC
Q_{gd}	Gate-Drain Charge		--	1.8	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-10 V, I_D=-5A, R_G=2.7Ω, V_{GS}=-10V	--	5	--	ns
t_r	Turn-on Rise Time		--	39	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	30	--	ns
t_f	Turn-Off Fall Time		--	31	--	ns
Source- Drain Diode Characteristics@ T_j= 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=-5A,V_{GS}=0V	--	-0.9	-1.2	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=-5A, V_{GS}=0V di/dt=-100A/μs	--	9.2	--	ns
Q_{rr}	Reverse Recovery Charge		--	4.0	--	nC

NOTE:

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

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

Typical Characteristics

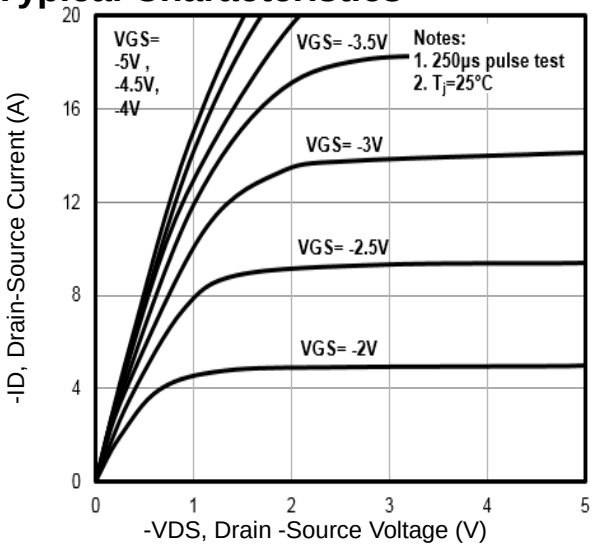


Fig1. Typical Output Characteristics

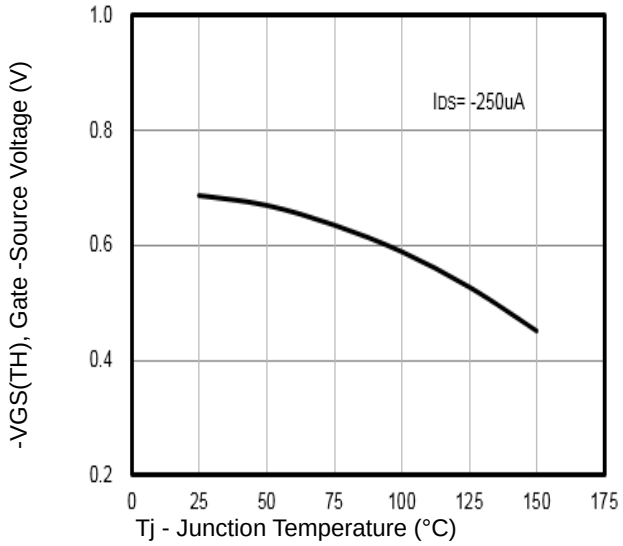


Fig2. $-V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

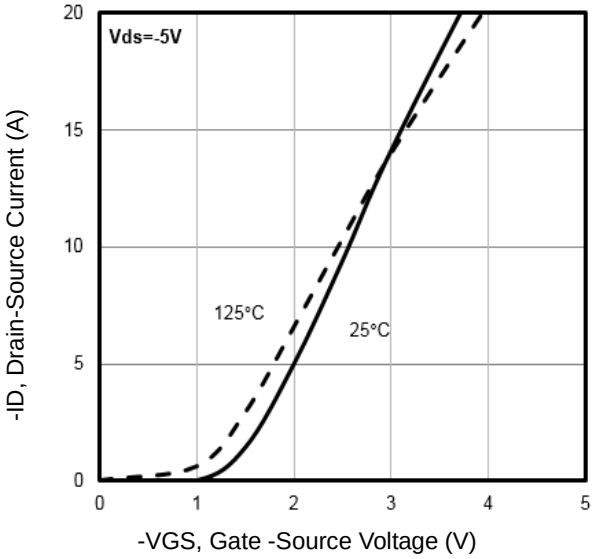


Fig3. Typical Transfer Characteristics

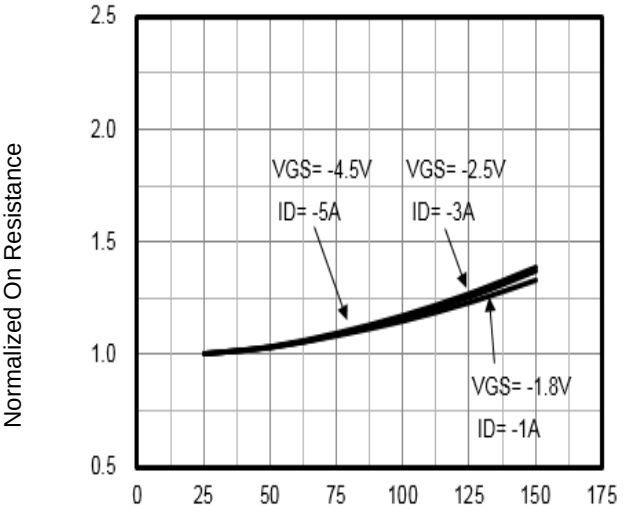


Fig4. Normalized On-Resistance Vs. Tj

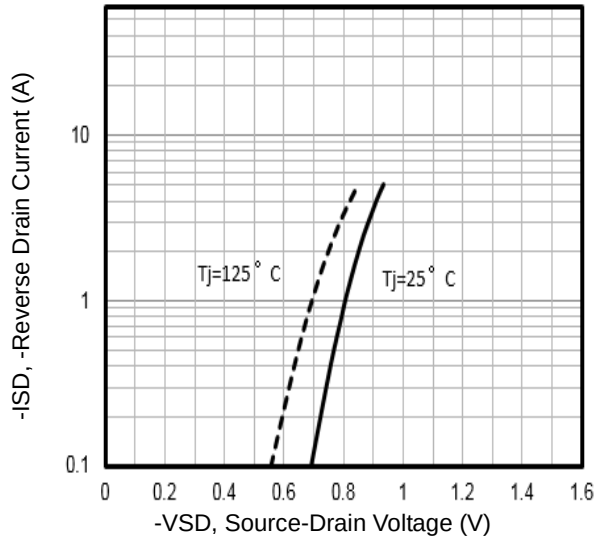


Fig5. Typical Source-Drain Diode Forward Voltage

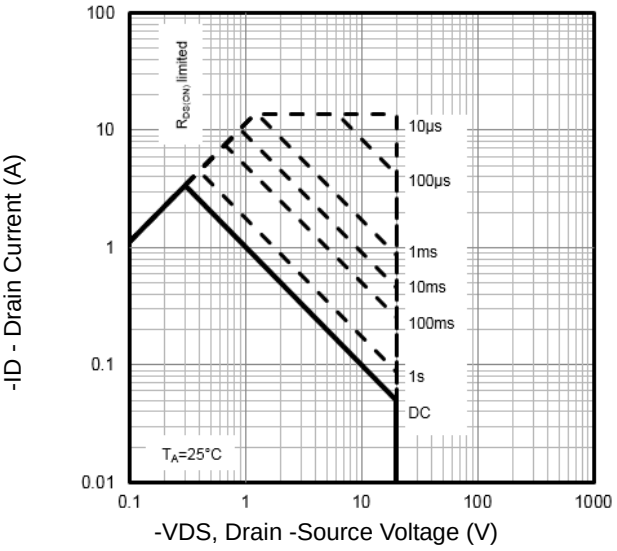


Fig6. Maximum Safe Operating Area

Typical Characteristics

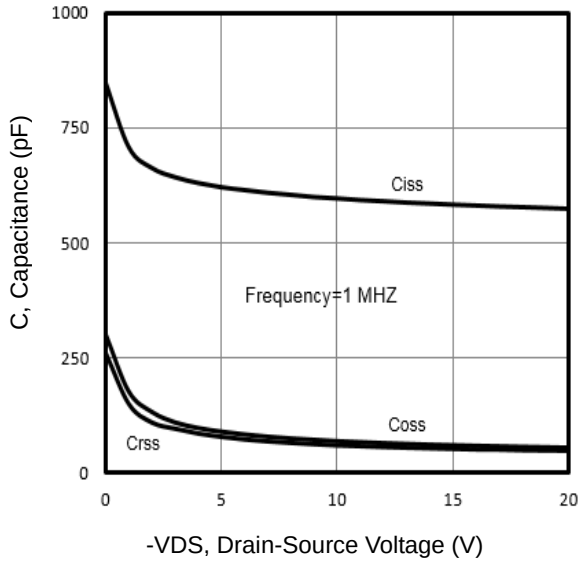


Fig7. Typical Capacitance Vs. Drain-Source Voltage

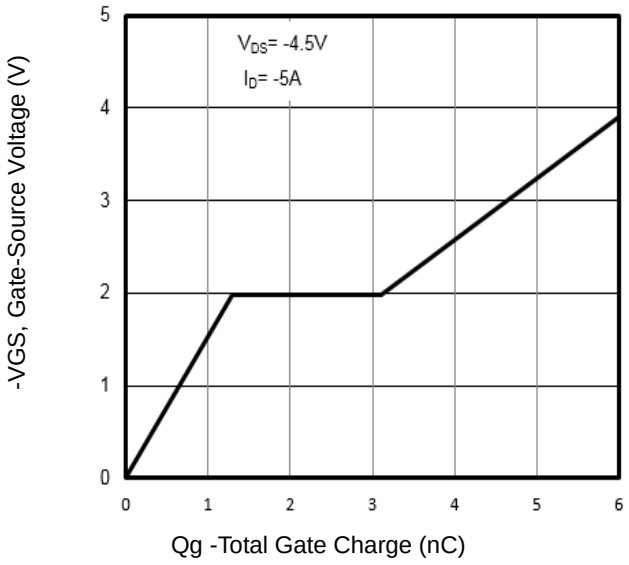


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

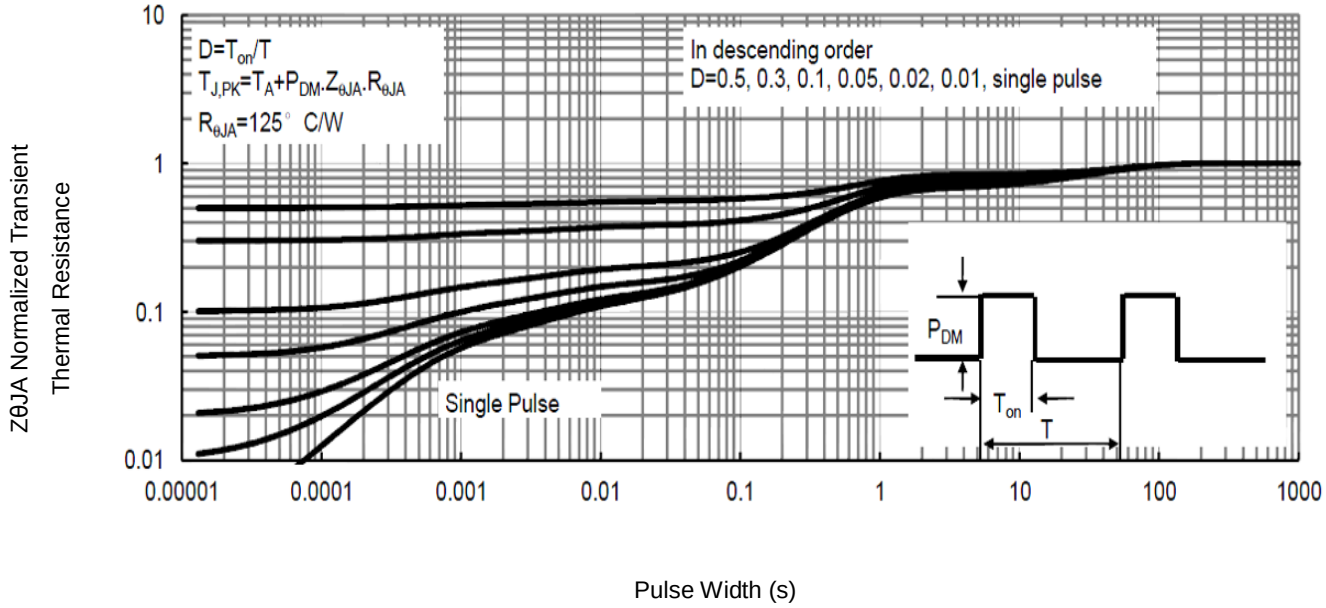


Fig9. Normalized Maximum Transient Thermal Impedance

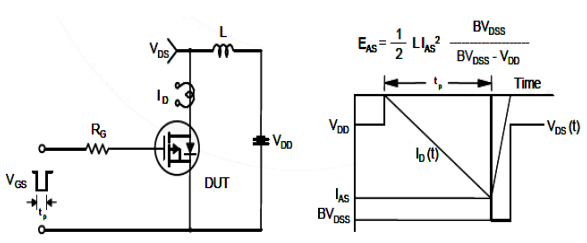


Fig10. Unclamped Inductive Test Circuit and waveforms

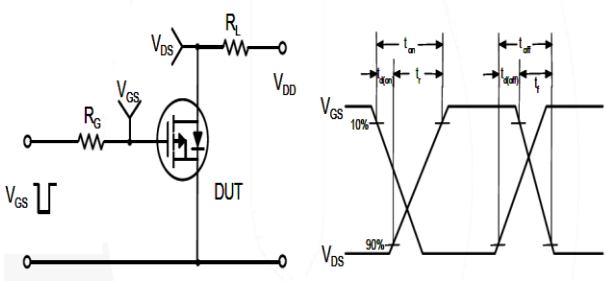
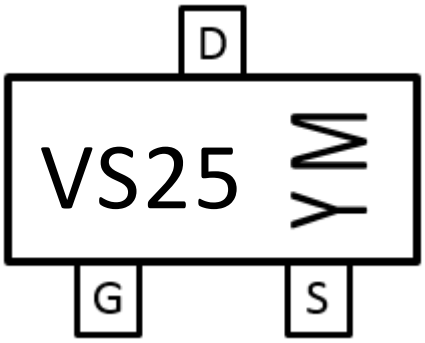


Fig11. Switching Time Test Circuit and waveforms

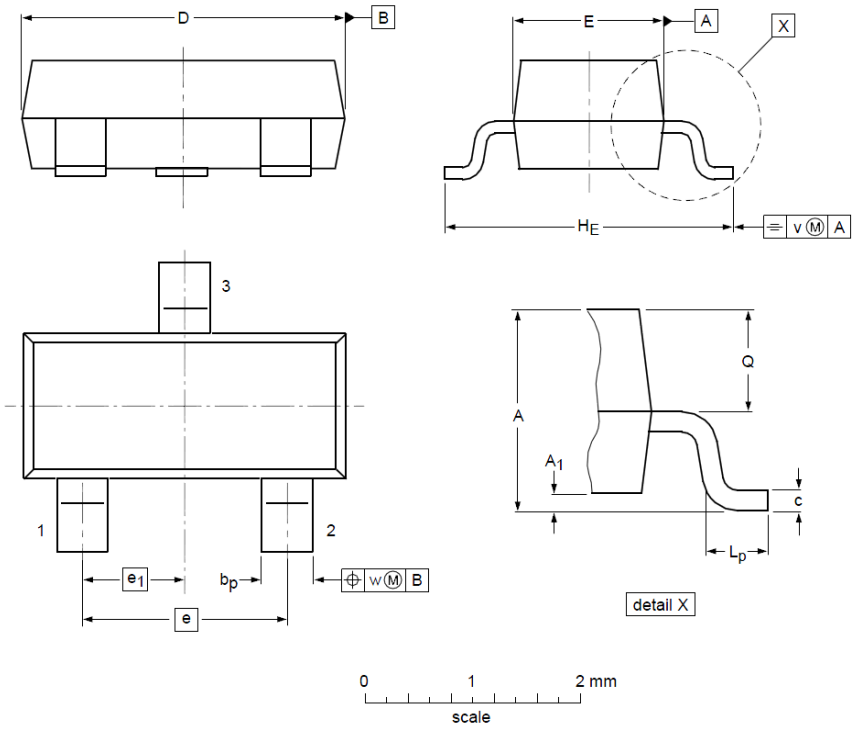
Marking Information



VS25： Part Number

YM： Date Code，Y means assembly year (e.g. E=2017, F=2018, G=2019, H=2020, etc)，
M means assembly month (e.g. 9=September, O=October, N=November, D=December, etc)

SOT23 Package Outline Data



Label	DIMENSIONS (unit: mm)		
	Min	Typ	Max
A	0.90	1.03	1.10
A_1	0.01	0.05	0.10
b_p	0.38	0.42	0.48
c	0.09	0.13	0.15
D	2.80	2.92	3.00
E	1.20	1.33	1.40
e	--	1.90	--
e_1	--	0.95	--
H_E	2.10	2.40	2.50
L_p	0.40	0.50	0.60
Q	0.45	0.49	0.55
v	--	0.20	--
w	--	0.10	--

Notes:

1. Follow JEDEC TO-236, variation AB.
2. Dimension "D" does NOT include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.25mm per side.
3. Dimension "E" does NOT include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.25mm per side.

Customer Service

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