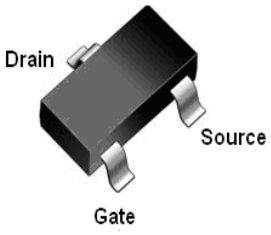
Features

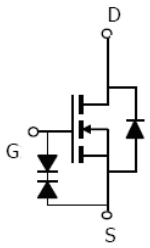
- N-Channel，2.5V Logic Level Control
- Enhancement mode
- Low on-resistance @ V_{GS}=2.5 V
- Fast Switching
- ESD Protection HBM 2.5KV
- Pb-free lead plating; RoHS compliant

Pb-Free RoHS HF Halogen-Free

V_{DS}	20	V
$R_{DS(on),typ}$ @V_{GS}=4.5 V	17	mΩ
$R_{DS(on),typ}$ @V_{GS}=2.5 V	23	mΩ
I_D	6.5	A

SOT23





Part ID	Package Type	Marking	Tape and reel information
VS3416AC	SOT23	V26	3000pcs/reel

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

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		20	V
I_S	Diode continuous forward current	T_C=25°C	1.3	A
I_D	Continuous drain current @V_{GS}=4.5V	T_C=25°C	6.5	A
		T_C=70°C	5.2	A
I_{DM}	Pulse drain current tested ①	T_C=25°C	26	A
P_D	Maximum power dissipation	T_C=25°C	1	W
V_{GS}	Gate-Source voltage		±8	V
ESD	HBM		2.5	KV
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

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	20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current (Tc=25℃)	V_{DS}=20V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	V_{DS}=20V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±4.5V,V_{DS}=0V	--	--	±1	μA
		V_{GS}=±8V,V_{DS}=0V	--	--	±10	μA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	0.4	0.8	1.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ②	V_{GS}=4.5V, I_D=6A	--	17	21	mΩ
		V_{GS}=2.5V, I_D=5A	--	23	28	mΩ
		V_{GS}=1.8V, I_D=2A	--	35	41	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=10V,V_{GS}=0V, f=1MHz	--	450	--	pF
C_{oss}	Output Capacitance		--	110	--	pF
C_{rss}	Reverse Transfer Capacitance		--	100	--	pF
Q_g	Total Gate Charge	V_{DS}=10V,I_D=6A, V_{GS}=4.5V	--	8.2	--	nC
Q_{gs}	Gate-Source Charge		--	2.4	--	nC
Q_{gd}	Gate-Drain Charge		--	3.3	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V, I_D=6A, R_G=3Ω, V_{GS}=4.5V, RL=2Ω,	--	6.5	--	ns
t_r	Turn-on Rise Time		--	8	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	35	--	ns
t_f	Turn-Off Fall Time		--	9.1	--	ns
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	T_j=25℃,I_{SD}=1.6A, V_{GS}=0V	--	0.76	1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=6A, dI/dt=100A/μs	--	15	--	ns
Q_{rr}	Reverse Recovery Charge		--	5.5	--	nC

NOTE:

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

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

Typical Characteristics

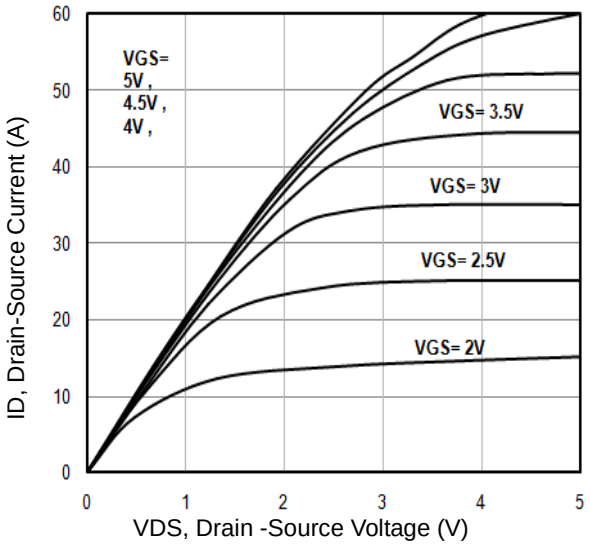


Fig1. Typical Output Characteristics

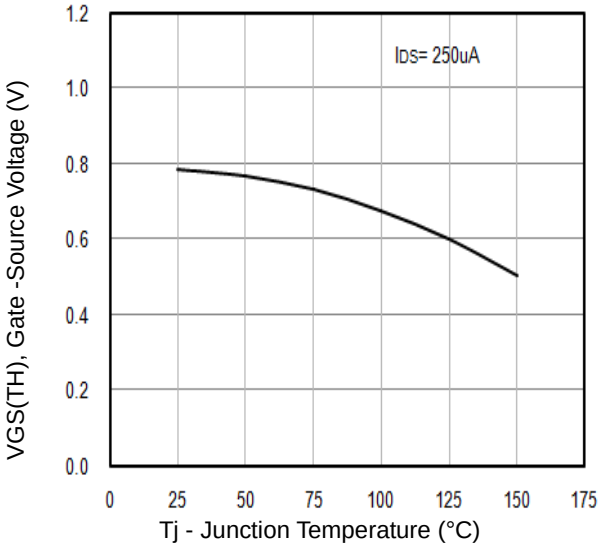


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

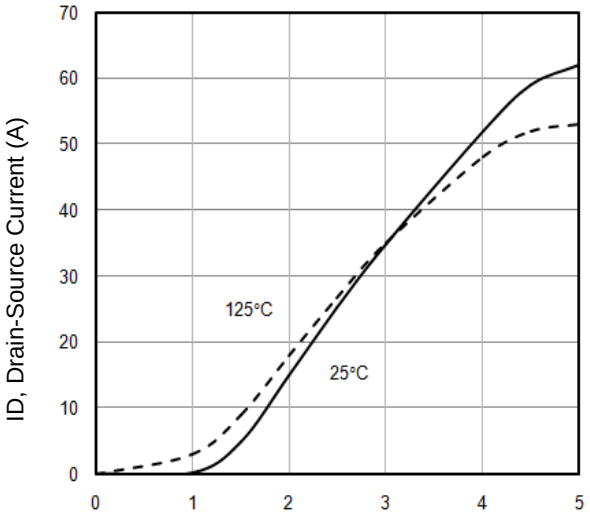


Fig3. Typical Transfer Characteristics

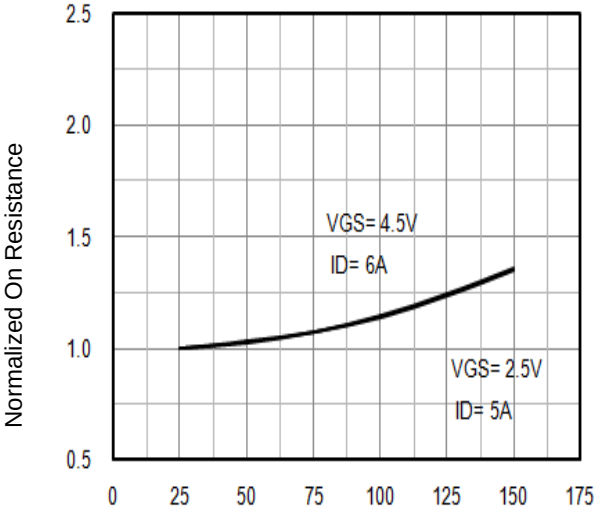


Fig4. Normalized On-Resistance Vs. Temperature

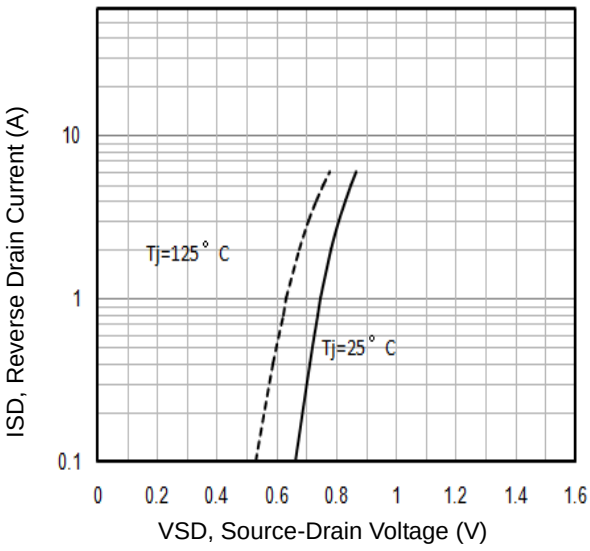


Fig5. Typical Source-Drain Diode Forward Voltage

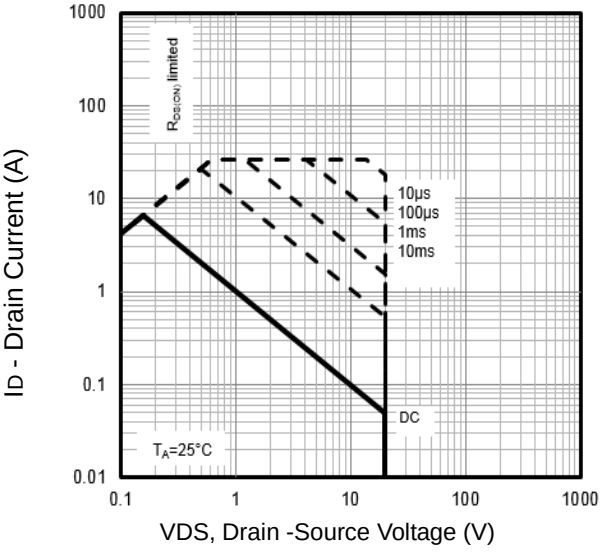


Fig6. Maximum Safe Operating Area

Typical Characteristics

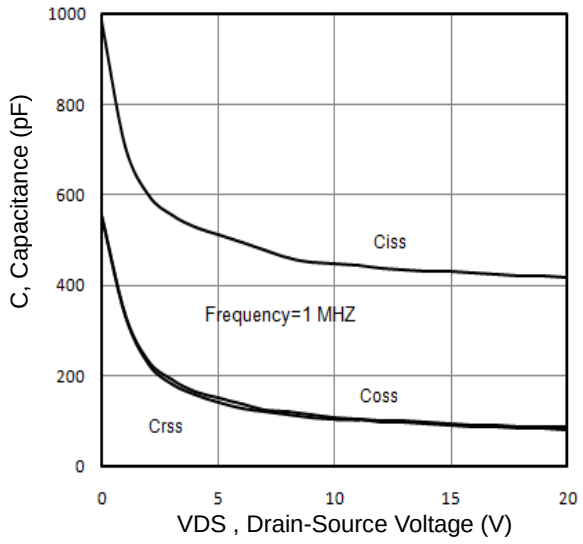


Fig7. Typical Capacitance Vs.Drain-Source Voltage

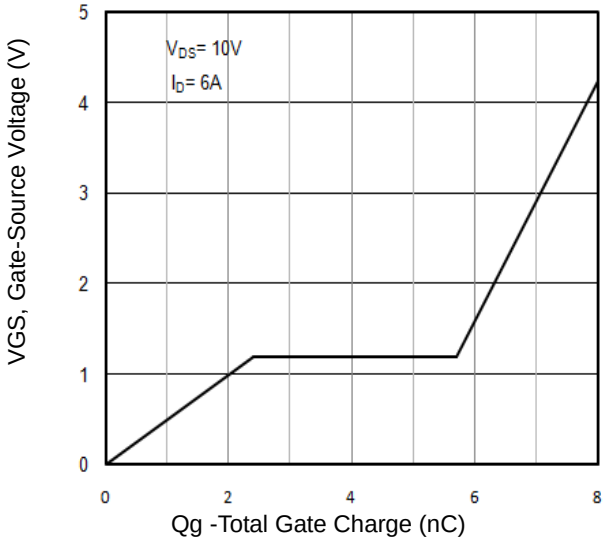


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

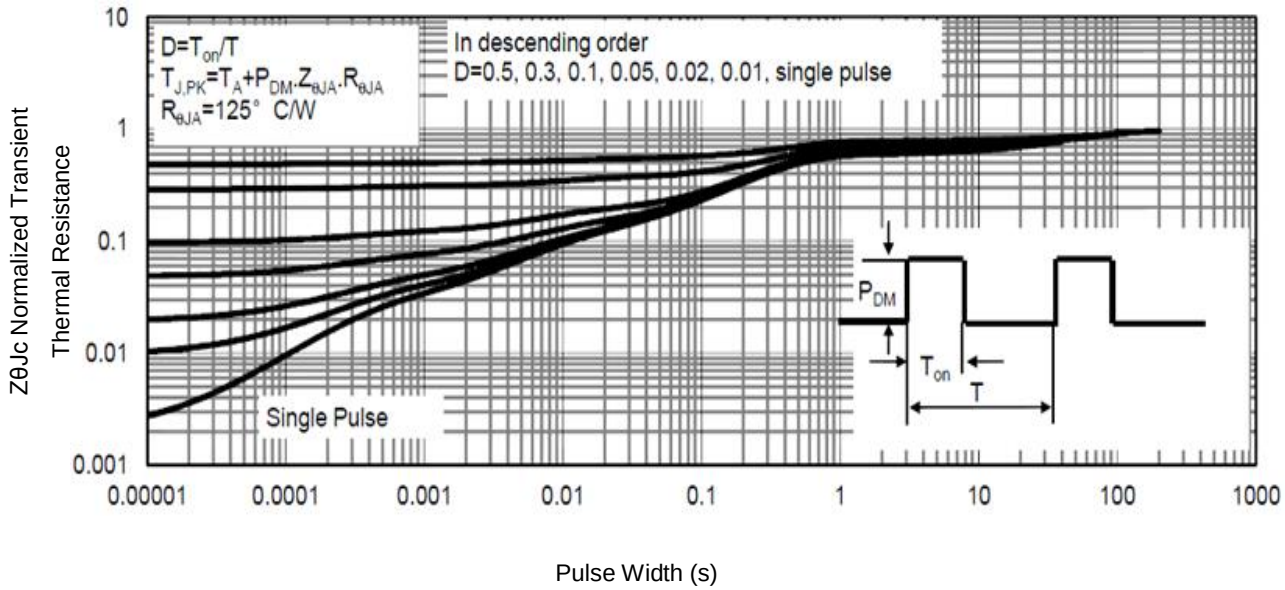


Fig9 . Normalized Maximum Transient Thermal Impedance

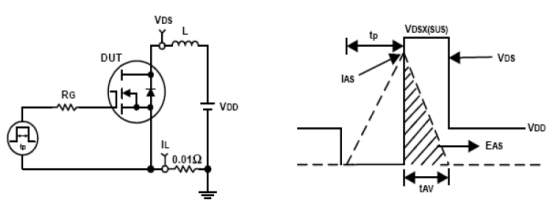


Fig10. Unclamped Inductive Test Circuit and waveforms

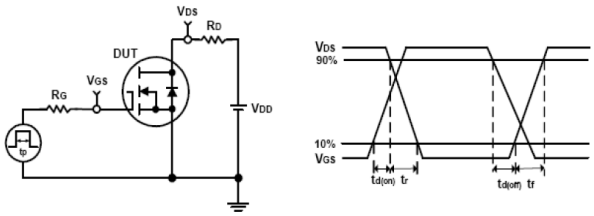
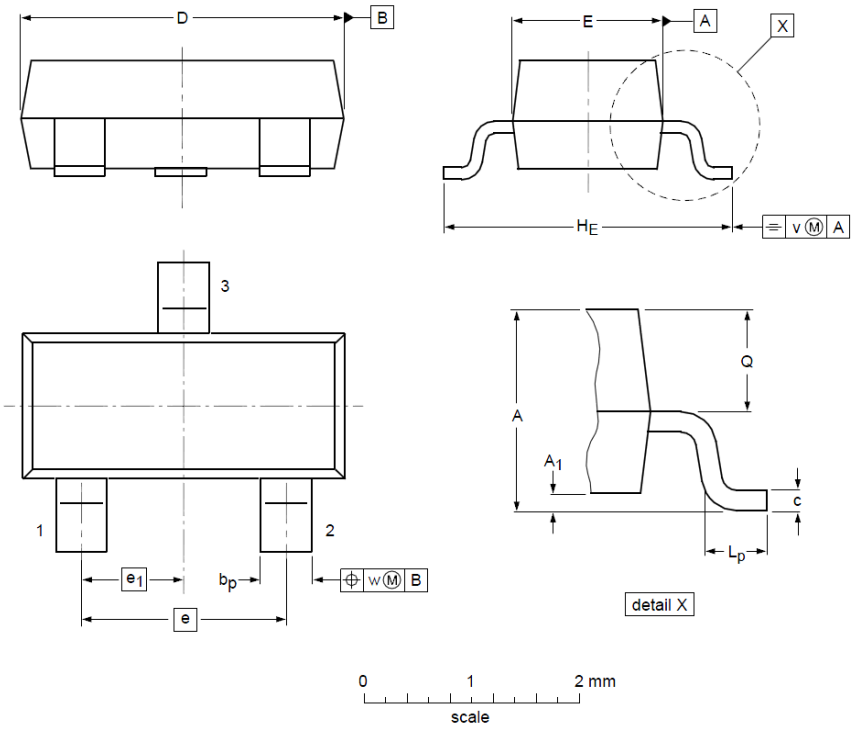


Fig11. Switching Time Test Circuit and waveforms

SOT23 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.

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