

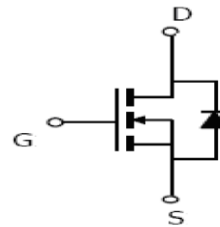
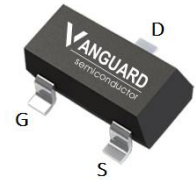
Features

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


Halogen-Free

Part ID	Package Type	Marking	Tape and reel information
VS6640AL	SOT23-3L	VS07	3000pcs/reel

V_{DS}	60	V
$R_{DS(on),TYP} @ V_{GS}=10\text{ V}$	69	mΩ
$R_{DS(on),TYP} @ V_{GS}=4.5\text{ V}$	85	mΩ
I_D	3.2	A

SOT23-3L


Maximum ratings, at $T_J=25\text{ °C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		60	V
I_S	Diode continuous forward current	$T_A=25\text{ °C}$	1.0	A
I_D	Continuous drain current @ $V_{GS}=10\text{ V}$	$T_A=25\text{ °C}$	3.2	A
		$T_A=100\text{ °C}$	2.0	A
I_{DM}	Pulse drain current tested ①	$T_A=25\text{ °C}$	12.5	A
P_D	Maximum power dissipation	$T_A=25\text{ °C}$	1.25	W
V_{GS}	Gate-Source voltage		±20	V
$T_{STG} T_J$	Storage and operating temperature range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JL}$	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	60	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V,V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _j =125°C)	V _{DS} =60V,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	1.3	2.0	2.4	V
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =10V, I _D =5A	--	69	86	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =4.5V, I _D =4A	--	85	107	mΩ
Dynamic Electrical Characteristics @ T _j = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =30V,V _{GS} =0V, f=1MHz	400	505	600	pF
C _{oss}	Output Capacitance		--	30	80	pF
C _{rss}	Reverse Transfer Capacitance		--	20	60	pF
R _g	Gate Resistance	f=1MHz		5.8		Ω
Q _g	Total Gate Charge	V _{DS} =30V,I _D =5A, V _{GS} =10V	--	11	--	nC
Q _{gs}	Gate-Source Charge		--	4	--	nC
Q _{gd}	Gate-Drain Charge		--	3.5	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =5A, R _G =3Ω, V _{GS} =10V	--	7.5	--	nS
t _r	Turn-on Rise Time		--	4.5	--	nS
t _{d(off)}	Turn-Off Delay Time		--	22.5	--	nS
t _f	Turn-Off Fall Time		--	9	--	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°C ,I _{sd} =5A, di/dt=500A/μs	--	10	--	nS
Q _{rr}	Reverse Recovery Charge			15		nC

NOTE:

- ① Repetitive rating; pulse width limited by max. junction temperature.
 ② Pulse width $\leq 300\mu s$; duty cycles $\leq 2\%$.

Typical Characteristics

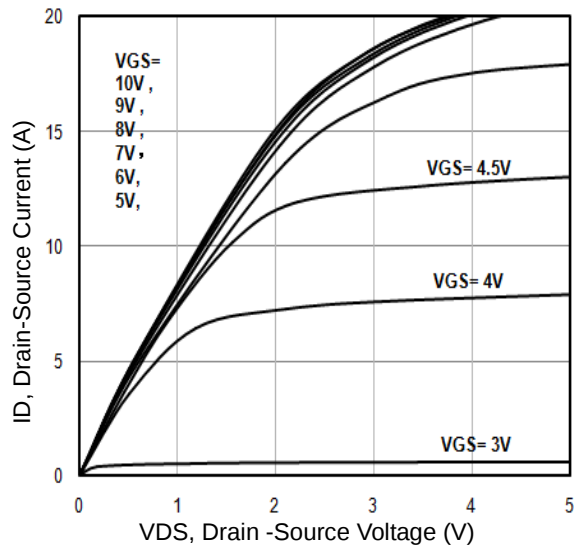


Fig1. Typical Output Characteristics

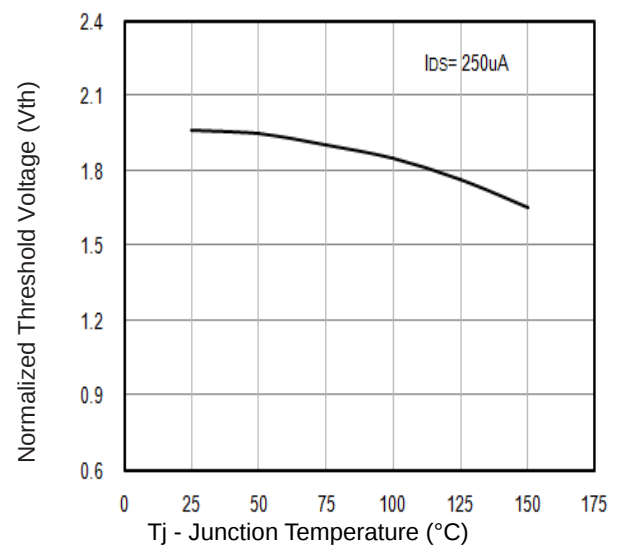


Fig2. $V_{GS(TH)}$ Gate-Source Voltage Vs. T_j

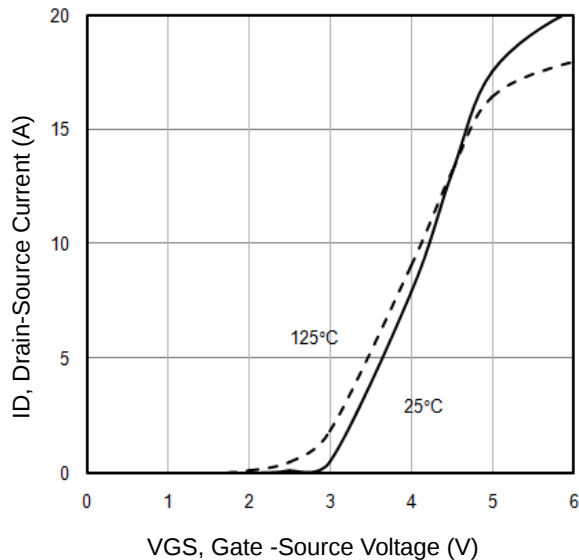


Fig3. Typical Transfer Characteristics

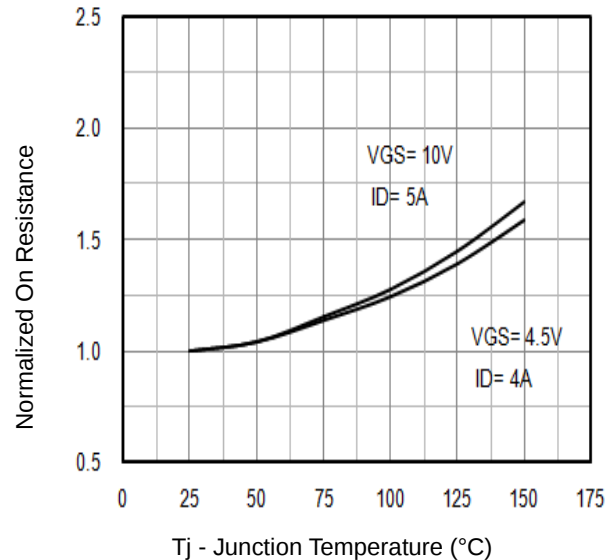


Fig4. Normalized On-Resistance Vs. T_j

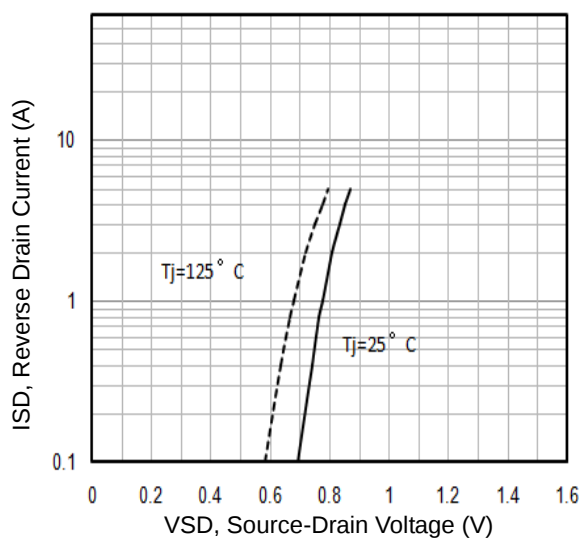


Fig5. Typical Source-Drain Diode Forward Voltage

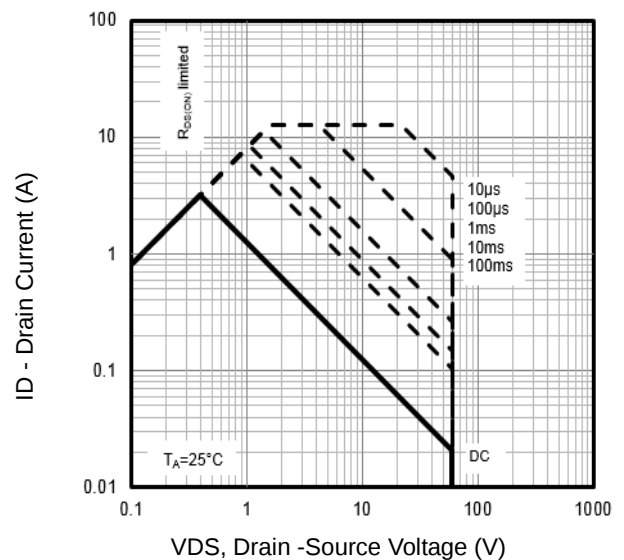
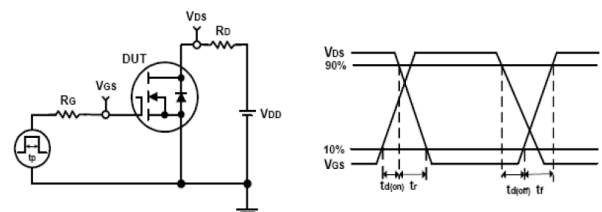
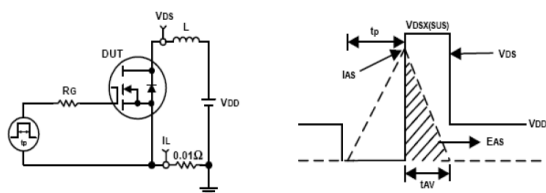
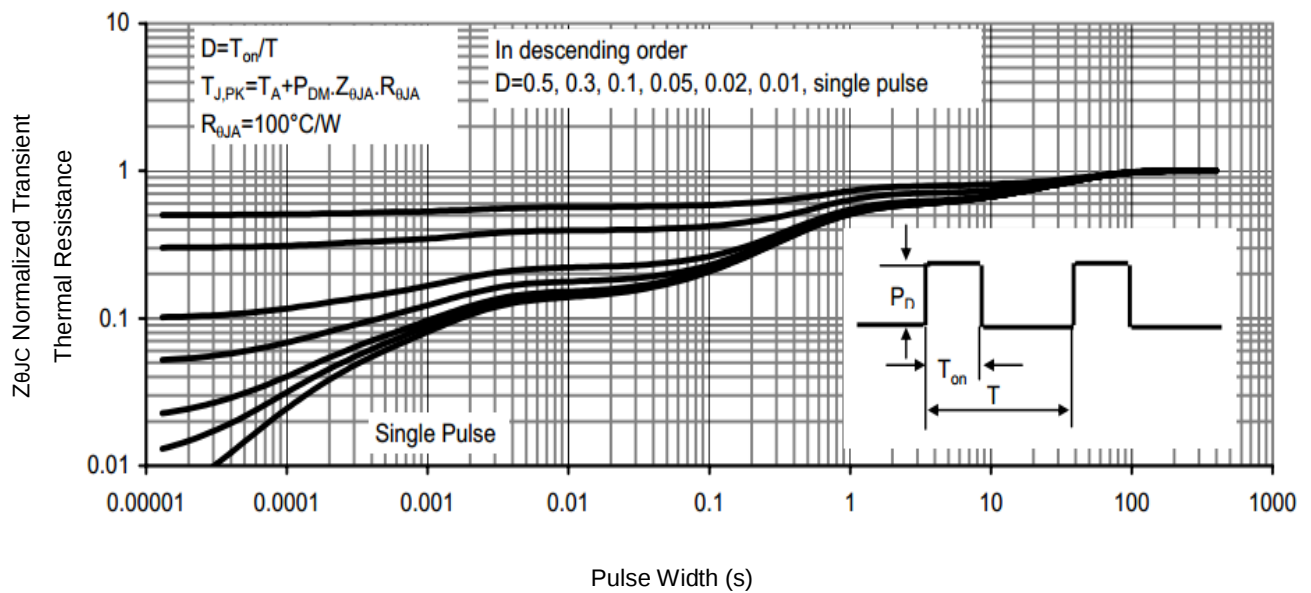
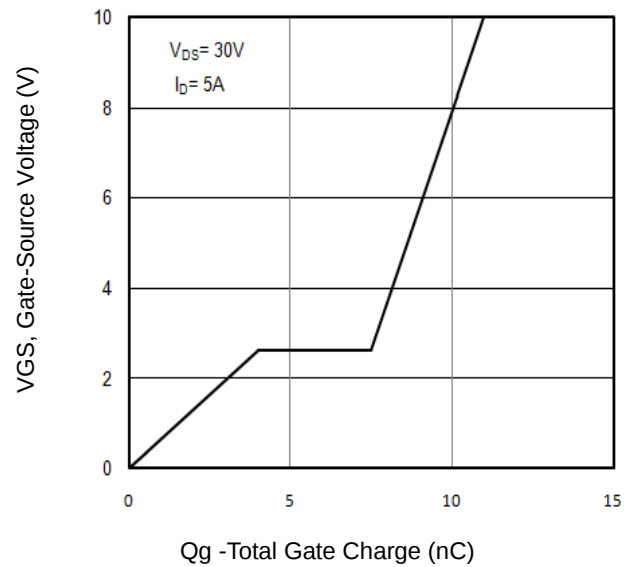
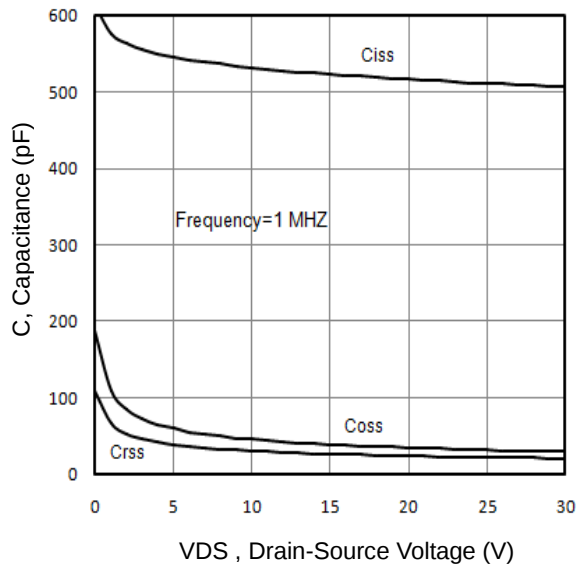
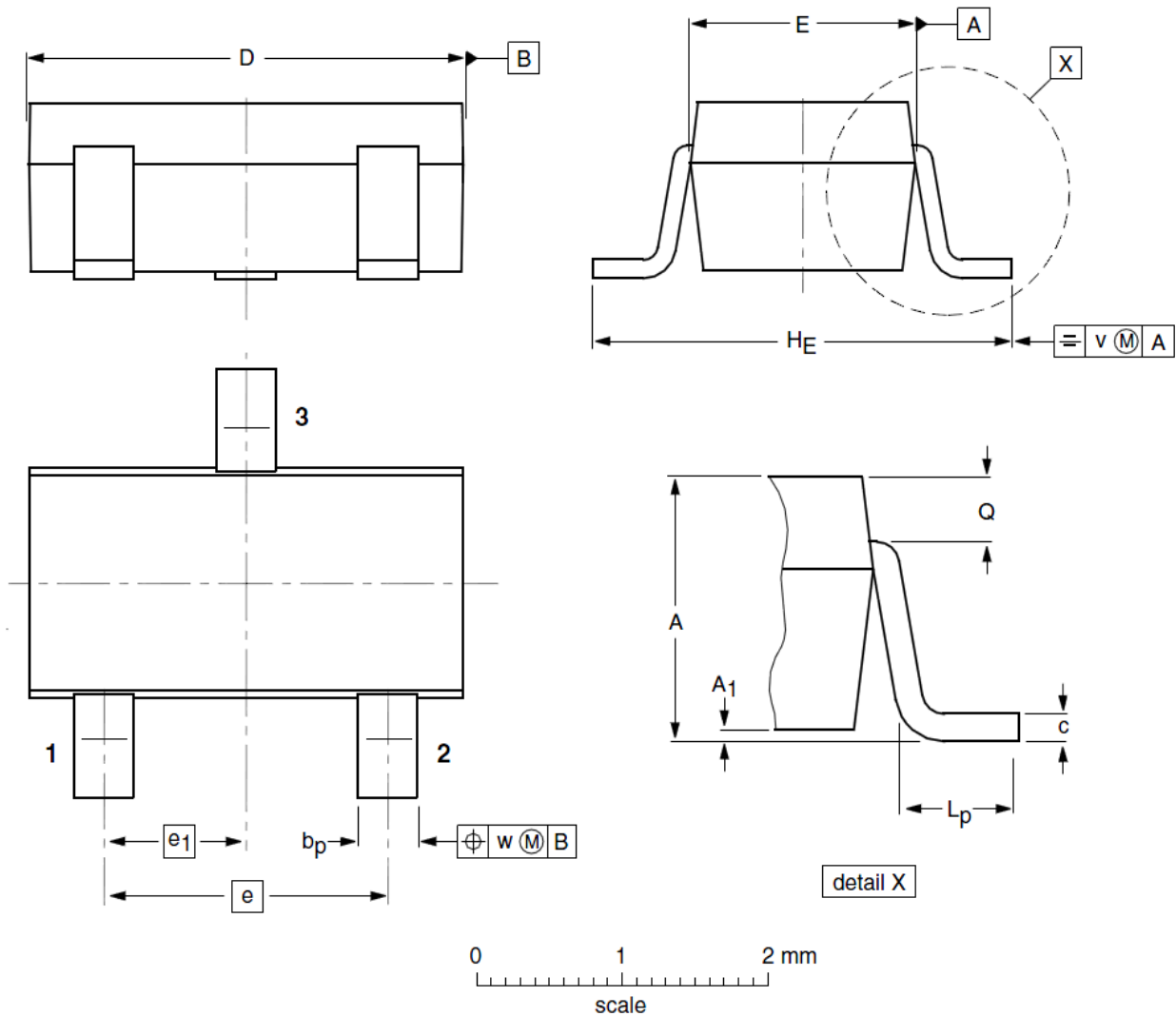


Fig6. Maximum Safe Operating Area

Typical Characteristics



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	--

Customer Service

Sales and Service:

sales@vgsemi.com

Vanguard Semiconductor CO., LTD

TEL: (86-755) -26902410

FAX: (86-755) -26907027

WEB: www.vgsemi.com