

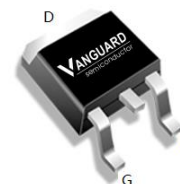
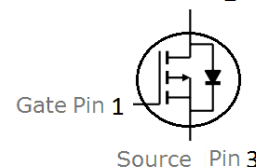
Features

- P-Channel, -5V Logic Level Control
- Low on-resistance $R_{DS(on)}$ @ $V_{GS} = -4.5V$
- Fast Switching
- Enhancement mode
- 100% Avalanche Tested
- Pb-free lead plating; RoHS compliant


Halogen-Free

Part ID	Package Type	Marking	Tape and reel information
VS3503AD	TO-252	3503AD	2500PCS/Reel

V_{DS}	-30	V
$R_{DS(on),TYP} @ V_{GS} = -10V$	3.9	mΩ
$R_{DS(on),TYP} @ V_{GS} = -4.5V$	5.9	mΩ
I_D	-130	A

TO-252

Drain Pin 2


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

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage	-30	V
I_S	Diode continuous forward current	$T_C = 25^\circ C$ -130	A
I_D	Continuous drain current @ $V_{GS} = -10V$	$T_C = 25^\circ C$ -130	A
		$T_C = 100^\circ C$ -92	A
I_{DM}	Pulse drain current tested ①	$T_C = 25^\circ C$ -520	A
EAS	Avalanche energy, single pulsed ②	36	mJ
P_D	Maximum power dissipation	$T_C = 25^\circ C$ 120	W
V_{GS}	Gate-Source voltage	± 20	V
$T_{STG} T_J$	Storage and operating temperature range	-55 to 175	$^\circ C$
Thermal Characteristics			
$R_{\theta JC}$	Thermal Resistance Junction-to-Case	1.25	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient	100	$^\circ C/W$

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	V _{DS} =-30V,V _{GS} =0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(T _J =125°C)	V _{DS} =-30V,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	-1.2	-1.6	-2.3	V
R _{DS(ON)}	Drain-Source On-State Resistance ③	V _{GS} =-10V, I _D =-30A	--	3.9	5	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ③	V _{GS} =-4.5V, I _D =-20A	--	5.9	7.5	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =-15V,V _{GS} =0V, f=1MHz	5000	6400	7800	pF
C _{oss}	Output Capacitance		680	1015	1350	pF
C _{rss}	Reverse Transfer Capacitance		550	875	1200	pF
R _g	Gate Resistance	f=1MHz		8.7		Ω
Q _g	Total Gate Charge	V _{DS} =-15V,I _D =-30A, V _{GS} =-10V	--	142	--	nC
Q _{gs}	Gate-Source Charge		--	22	--	nC
Q _{gd}	Gate-Drain Charge		--	34	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =-15V, I _D =-30A, R _G =3.0Ω, V _{GS} =-10V	--	14	--	nS
t _r	Turn-on Rise Time		--	15	--	nS
t _{d(off)}	Turn-Off Delay Time		--	90	--	nS
t _f	Turn-Off Fall Time		--	34	--	nS
Source- Drain Diode Characteristics@ T _J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =-20A,V _{GS} =0V	--	-0.8	-1.2	V
t _{rr}	Reverse Recovery Time	T _J =25°C,I _{sd} =-30A, V _{GS} =0V	--	21	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=-500A/μs		57		nC

NOTE:

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

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = -10A, V_{GS} = -10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycles ≤ 2%.



Typical Characteristics

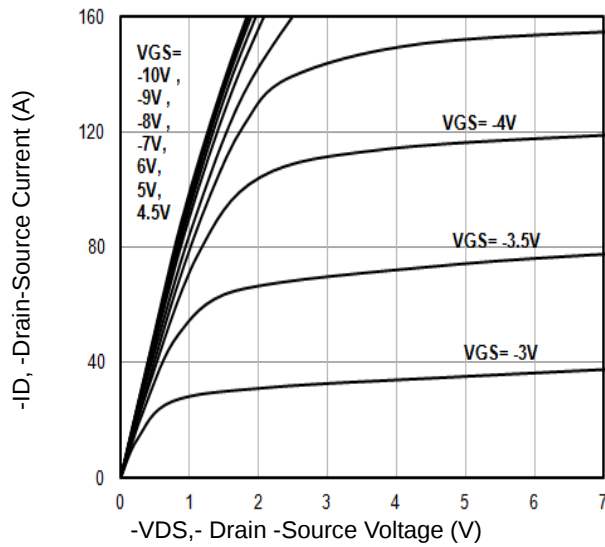


Fig1. Typical Output Characteristics

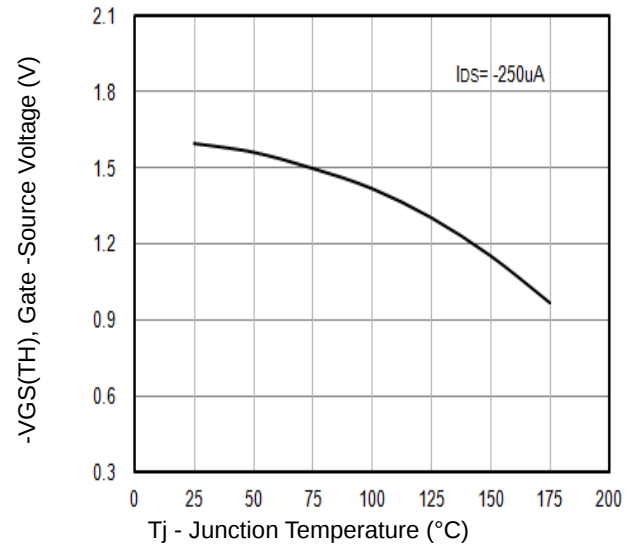


Fig2. $-V_{GS(TH)}$ Gate -Source Voltage Vs. T_j

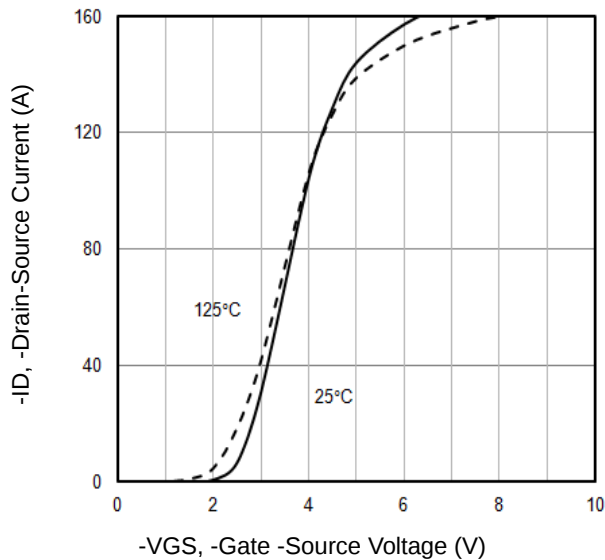


Fig3. Typical Transfer Characteristics

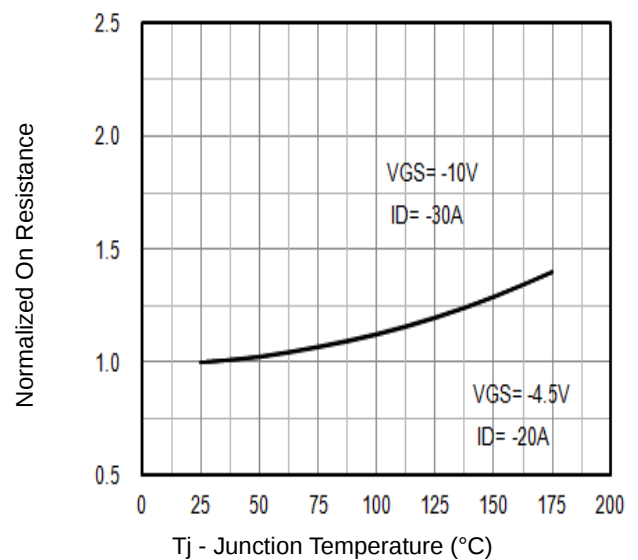


Fig4. Normalized On-Resistance Vs. T_j

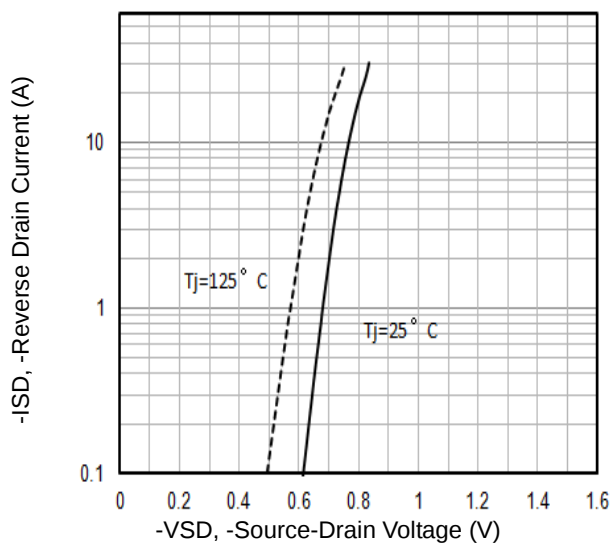


Fig5. Typical Source-Drain Diode Forward Voltage

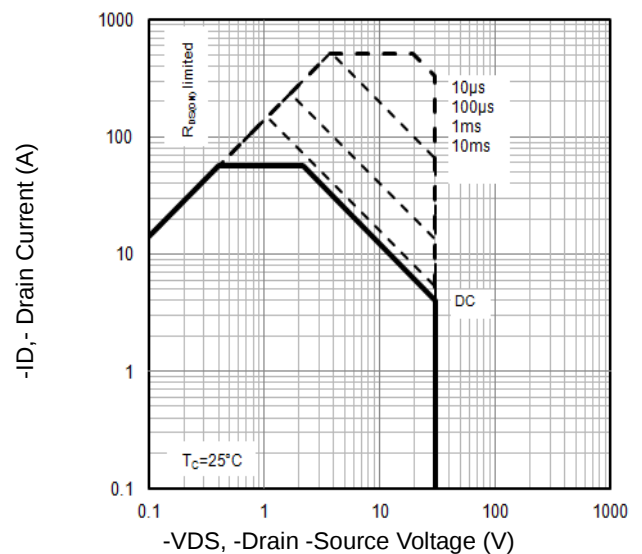
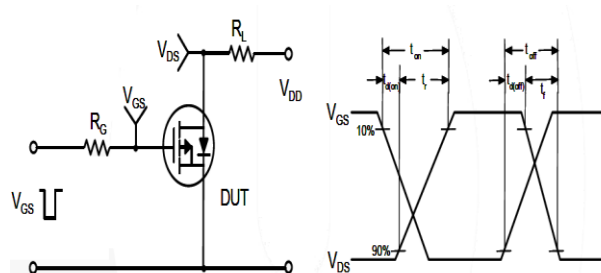
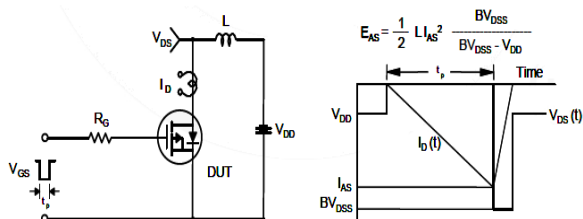
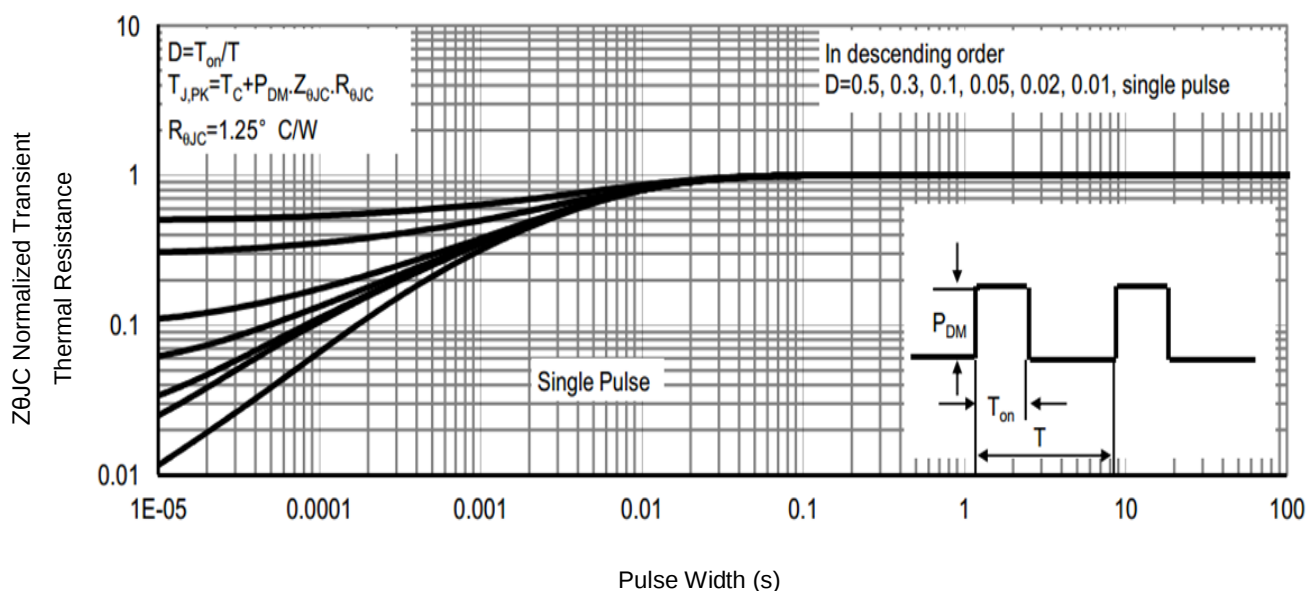
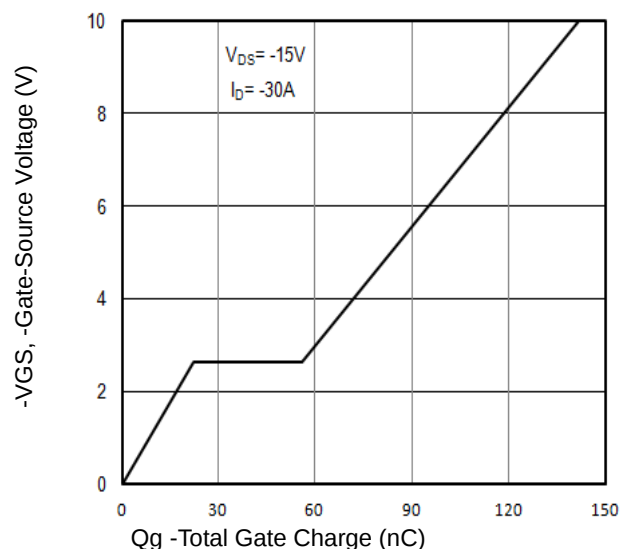
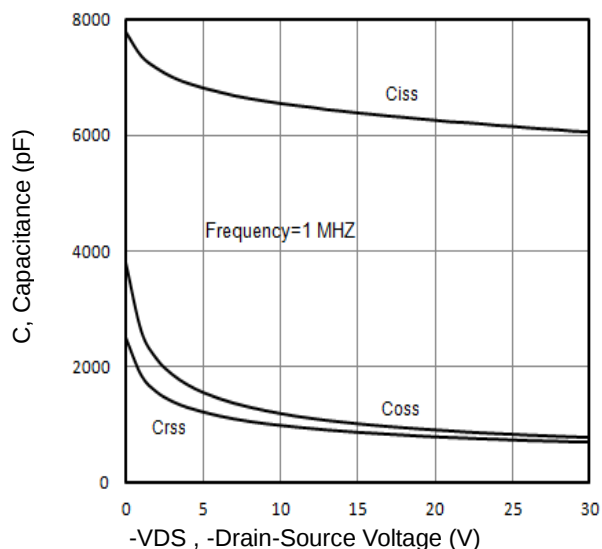
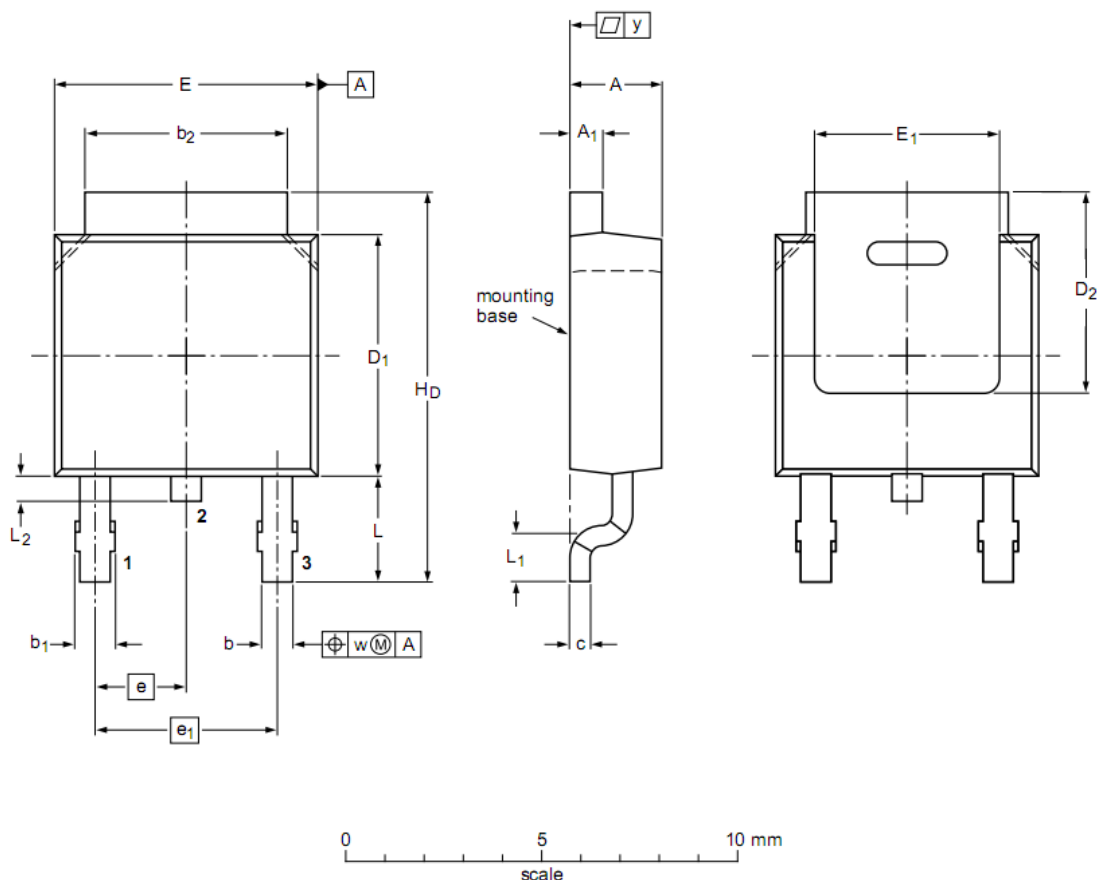


Fig6. Maximum Safe Operating Area

Typical Characteristics



TO-252 Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	2.20	2.30	2.38
A ₁	0.46	0.50	0.63
b	0.64	0.76	0.89
b ₁	0.77	0.85	1.14
b ₂	5.00	5.33	5.46
c	0.458	0.508	0.558
D ₁	5.98	6.10	6.223
D ₂	5.21	--	--
E	6.40	6.60	6.731
E ₁	4.40	--	--
e	2.286 BSC		
e ₁	--	4.57	--
H _D	9.40	10.00	10.40
L	2.743 REF		
L ₁	1.40	1.52	1.77
L ₂	0.50	0.80	1.01
w	--	0.20	--
y	--	--	0.20

Notes:

1. Refer to JEDEC TO-252 variation AA
2. Dimension "E" does NOT include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.1524mm per side.
3. Dimension "D₁" does NOT include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.1524mm per end.

Customer Service

Sales and Service:

sales@vgsemi.com

Vanguard Semiconductor CO., LTD

TEL: (86-755) -26902410

FAX: (86-755) -26907027

WEB: www.vgsemi.com