

Features

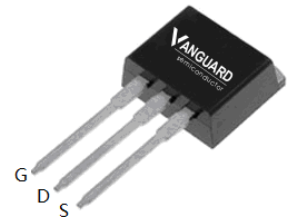
- N-Channel, 5V Logic Level Control
- Enhancement mode
- Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5\text{ V}$
- Fast Switching
- 100% Avalanche test
- Pb-free lead plating; RoHS compliant



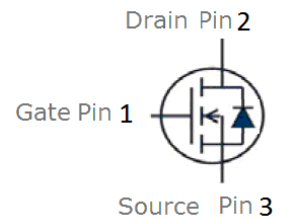
Halogen-Free

V_{DS}	60	V
$R_{DS(on),TYP} @ V_{GS}=10\text{ V}$	7	mΩ
$R_{DS(on),TYP} @ V_{GS}=4.5\text{ V}$	8	mΩ
I_D	65	A

TO-251



Part ID	Package Type	Marking	Tape and reel information
VS6065AI	TO-251	6065AI	75PCS/Tube



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

Symbol	Parameter		Rating	Unit
V _{(BR)DSS}	Drain-Source breakdown voltage		60	V
I _S	Diode continuous forward current	T _C =25°C	65	A
I _D	Continuous drain current@V _{GS} =10V	T _C =25°C	65	A
		T _C =100°C	40	A
I _{DM}	Pulse drain current tested ①	T _C =25°C	250	A
EAS	Avalanche energy, single pulsed ②		256	mJ
P _D	Maximum power dissipation	T _C =25°C	60	W
V _{GS}	Gate-Source voltage		±20	V
T _{STG} T _J	Storage and operating temperature range		-55 to 175	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2.5	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	60	$^\circ\text{C/W}$

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T _c = 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(T _c =25°C)	V _{DS} =60V,V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _c =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	2	3	V
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =10V, I _D =50A	--	7.0	10.0	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =4.5V, I _D =10A	--	8.0	14.0	mΩ
Dynamic Electrical Characteristics @ T _c = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =25V,V _{GS} =0V, f=1MHz	--	3310	--	pF
C _{oss}	Output Capacitance		--	740	--	pF
C _{rss}	Reverse Transfer Capacitance		--	290	--	pF
Q _g	Total Gate Charge	V _{DS} =55V,I _D =30A, V _{GS} =10V	--	48	--	nC
Q _{gs}	Gate-Source Charge		--	12	--	nC
Q _{gd}	Gate-Drain Charge		--	10	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =1A, R _G =6.8Ω, V _{GS} =10V	--	15	--	nS
t _r	Turn-on Rise Time		--	13	--	nS
t _{d(off)}	Turn-Off Delay Time		--	27	--	nS
t _f	Turn-Off Fall Time		--	22	--	nS
Source- Drain Diode Characteristics@ T _c = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =20A,V _{GS} =0V	--	0.81	1.2	V
t _{rr}	Reverse Recovery Time	T _j =25°C ,I _{sd} =20A, V _{GS} =0V di/dt=100A/μs	--	62	--	nS
Q _{rr}	Reverse Recovery Charge			80		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} = 28A, V_{GS}=10V. Part not recommended for use above this value
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

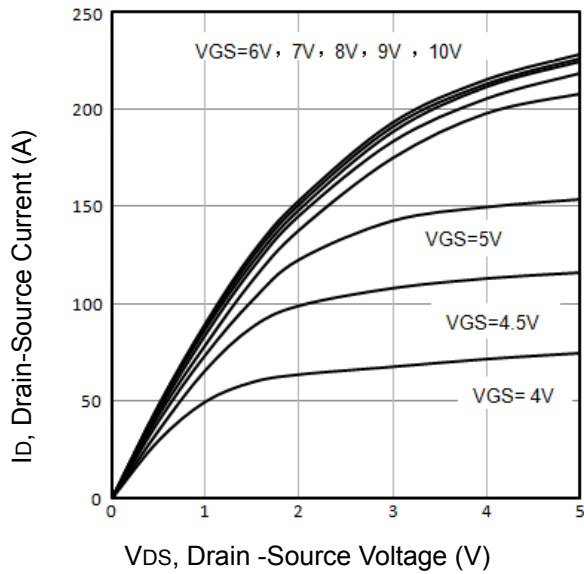


Fig1. Typical Output Characteristics

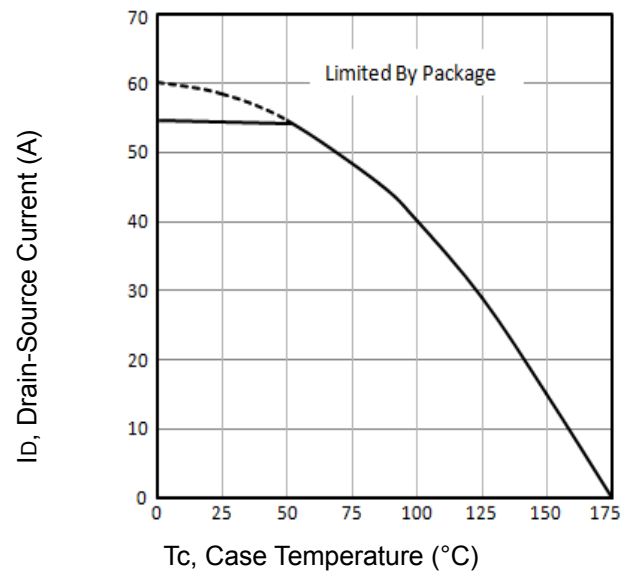


Fig2. Maximum Drain Current Vs. Case Temperature

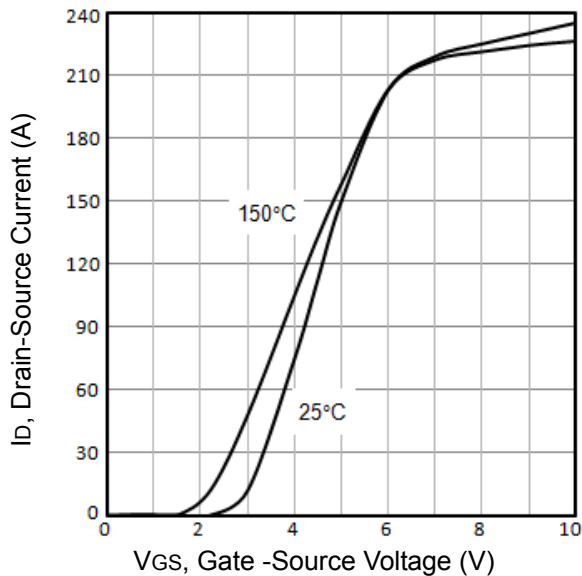


Fig3. Typical Transfer Characteristics

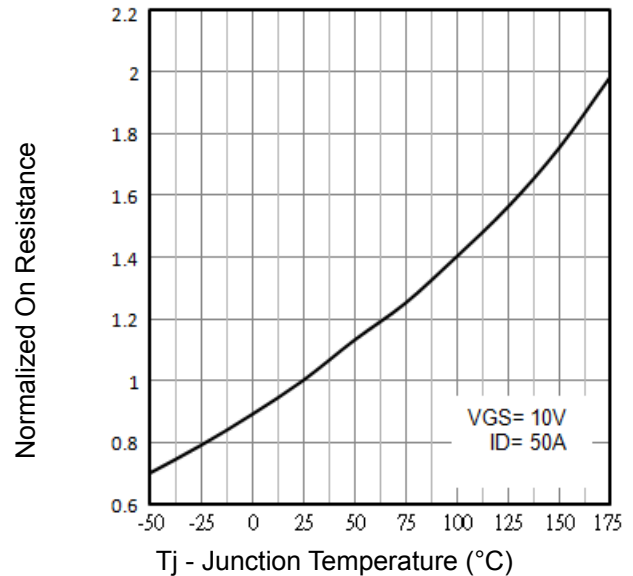


Fig4. Normalized On-Resistance Vs. Tj

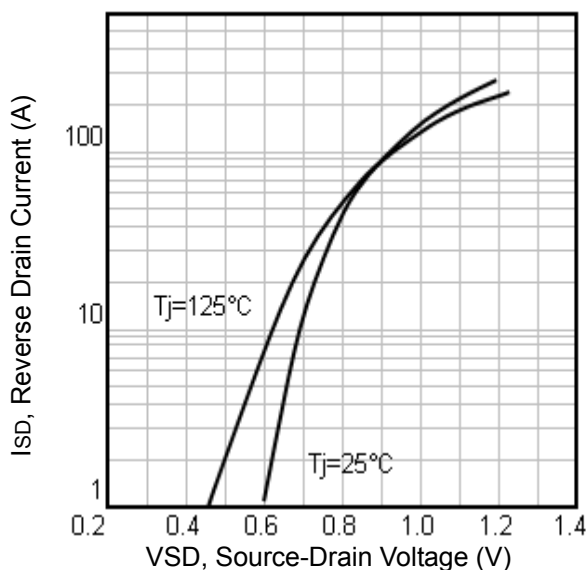


Fig5. Typical Source-Drain Diode Forward Voltage

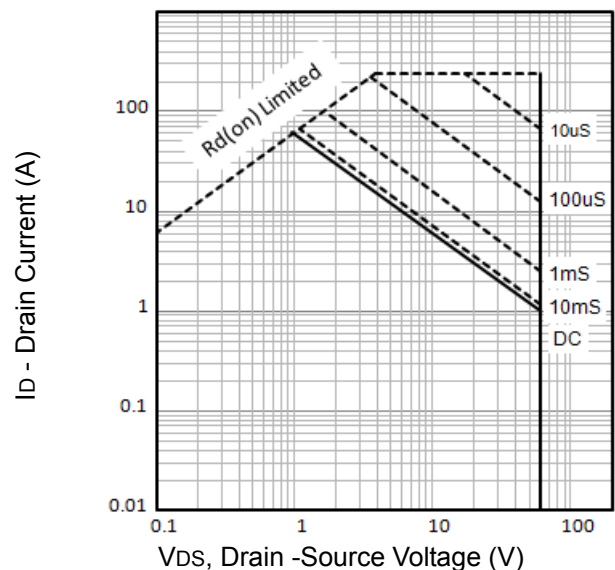
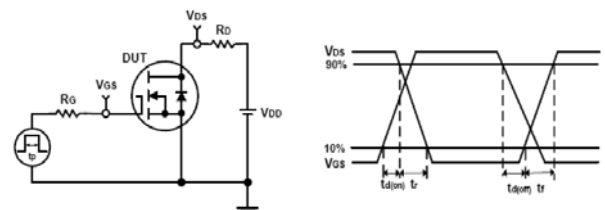
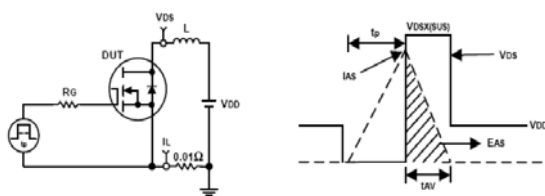
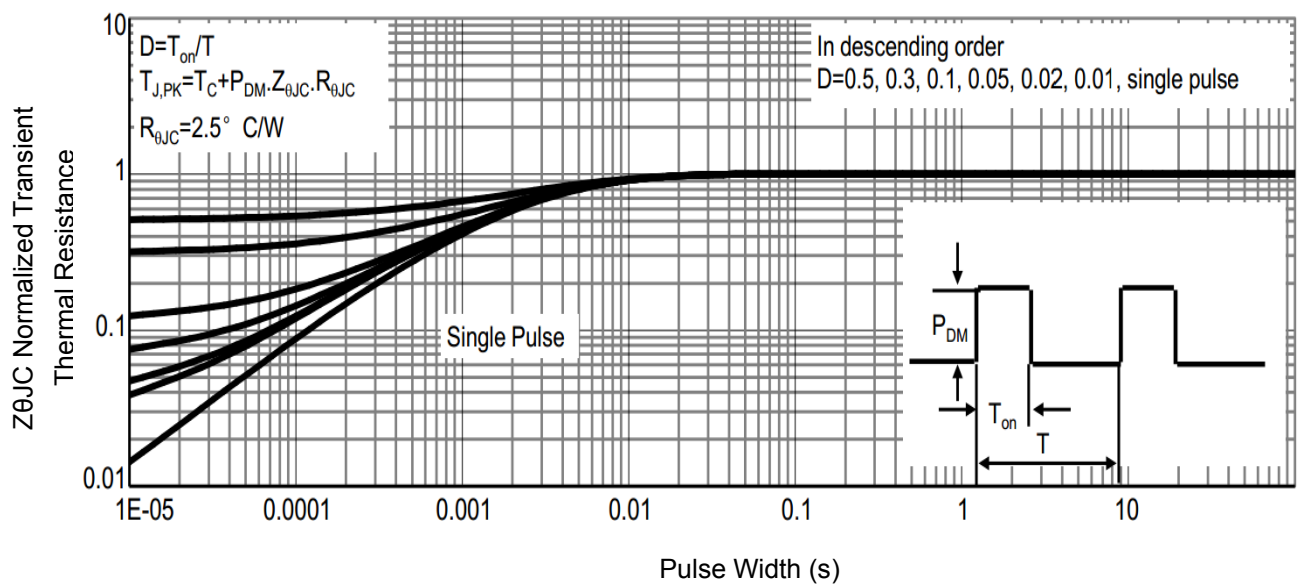
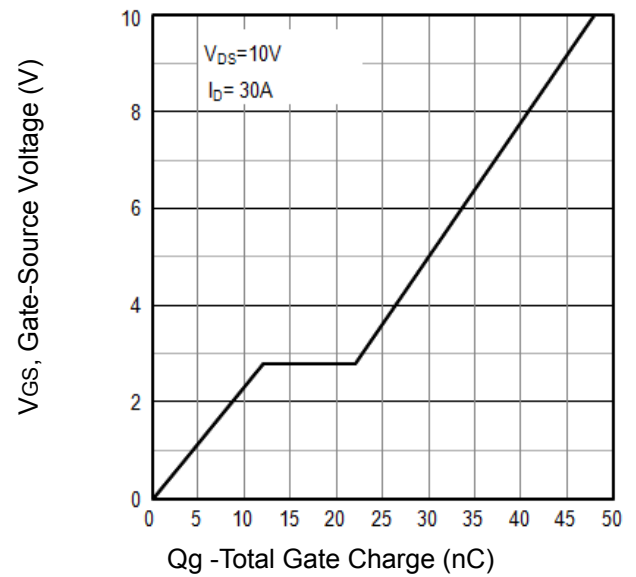
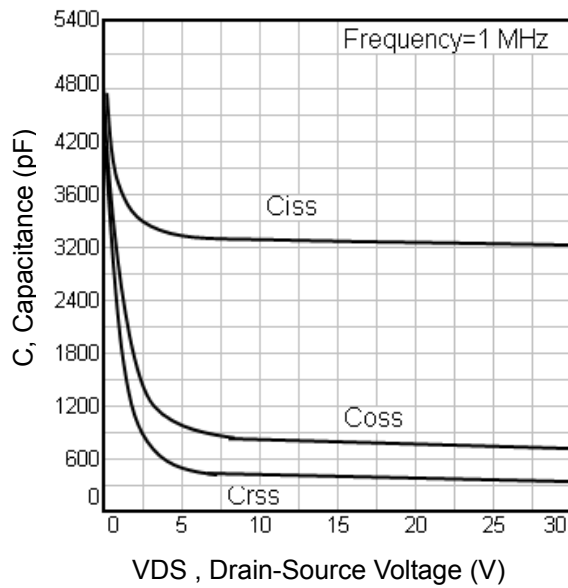
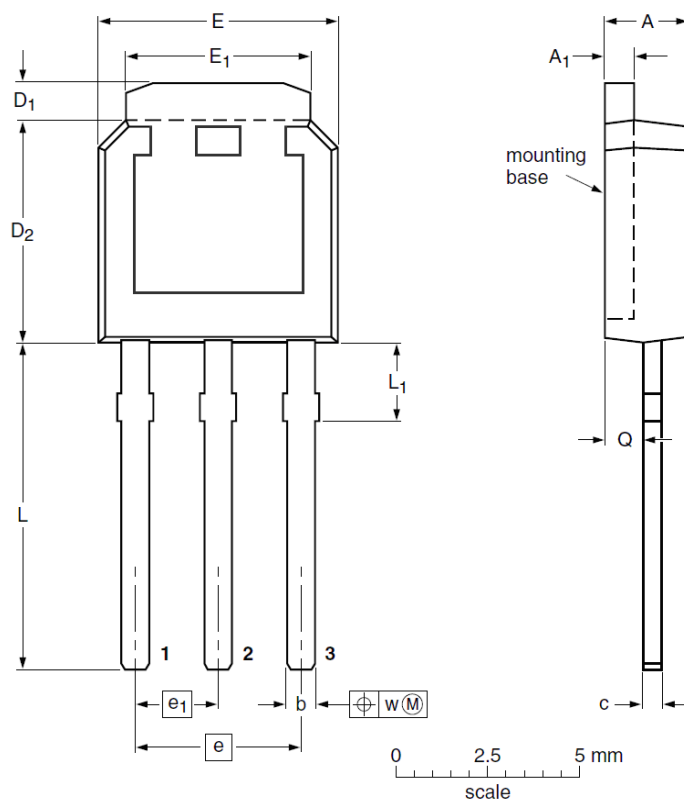


Fig6. Maximum Safe Operating Area



TO-251 Package Outline Data



DIMENSIONS (unit : mm)

Label	Min	Typ	Max	Label	Min	Typ	Max
A	2.22	2.30	2.38	A ₁	0.46	0.55	0.93
b	0.71	0.78	0.89	c	0.46	0.51	0.56
D ₁	0.96	1.02	1.10	D ₂	5.98	6.05	6.22
E	6.47	6.60	6.73	E ₁	5.20	5.33	5.55
e	--	4.57	--	e ₁	--	2.28	--
L	9.20	9.38	9.60	L ₁	--	2.70	--
Q	1.00	1.05	1.10	w	--	0.30	--

Customer Service

Sales and Service:

sales@vgsemi.com

Shen Zhen Vanguard Semiconductor CO., LTD

TEL: (86-755) -26902410

FAX: (86-755) -26907027

WEB: www.vgsemi.com