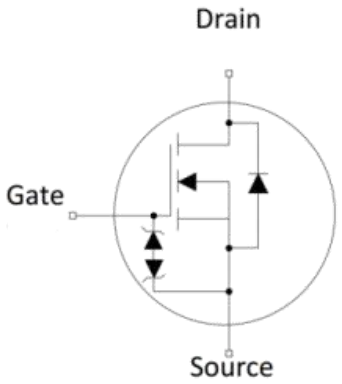
VSTL065R15BNA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
650V	1500mΩ@10V	5A

Symbol



Symbol of VSTL065R15BNA

Features

- Low RDS(on) & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Integrated ESD protection diode

Package Type

TO-252
Package Type of VSTL065R15BNA

Application

- PC power
- Telecom power
- Server power
- EV Charger
- Motor driver

Ordering Information

Product Name	Package	Marking
VSTL065R15BNA	TO-252	STL065R15BNA

Absolute Maximum Ratings (T_J= 25 ºC, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current Note 1	T_C=25ºC	I_D	5	A
Pulsed Drain Current Note 2	T_C=25ºC	$I_{D, pulse}$	15	A
Continuous Diode Forward Current Note 1	T_C=25ºC	I_S	5	A
Diode Pulsed Current Note 2	T_C=25ºC	$I_{S, pulse}$	15	A
Max Power Dissipation Note 3	T_C=25ºC	P_D	89	W
Avalanche Current, Single Pulse Note 4		I_{AS}	1.86	A
Avalanche Energy, Single Pulse Note4		E_{AS}	104	mJ
Gate source ESD(HBM-C=100pF, R=1.5kΩ)		$V_{ESD(G-S)}$	Class 2	-
MOSFET dv/dt ruggedness, V_{DS}=0~480V		dv/dt	50	V/ns
Reverse diode dv/dt, V_{DS}=0~480V, I_{SD}<= I_D		dv/dt	15	V/ns
Operation and storage temperature		T_J,T_{STG}	-55 to 150	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{θJC}$	-	1.4	-	ºC/W
Thermal Resistance, Junction-to-Ambient Note5	$R_{θJA}$	-	62.5	-	

Notes:

Note1: Calculated continuous current based on maximum allowable junction temperature.

Note2: Pulse width limited by safe operating area.

Note3: Based on max. junction temperature, using junction-case thermal resistance.

Note4: V_{DD}=100V, V_{GS}=10V, L=60mH, starting T_A=25 °C.

Note5: When mounted on 1 inch square copper board, t≤10sec. The value in any given application depends on the user's specific board design.

Electrical Characteristics (T_J= 25 ºC, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250uA	650	-	-	V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=650V, V_{GS}=0V	-	-	1	uA
Gate-Source Leakage Current	Forward	I_{GSSF}	V_{GS}=30V, V_{DS}=0V	-	-	1	uA
	Reverse	I_{GSSR}	V_{GS}=-30V, V_{DS}=0V	-	-	-1	
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	3.0	4.0	5.0	V
Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=2A	-	1300	1500	mΩ
Gate Resistance		R_G	F=1MHz, Open Drain	-	16.6	-	Ω
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS}=50V	-	230	-	pF
Output Capacitance		C_{oss}	V_{GS}=0V	-	29	-	pF
Reverse Transfer Capacitance		C_{rss}	f=100KHz	-	4.16	-	pF
Turn-on Delay Time		$t_{d(on)}$	V_{DS}=380V	-	8.36	-	ns
Rise Time		t_r	I_D=4A	-	22.3	-	
Turn-off Delay Time		$t_{d(off)}$	R_G=25Ω	-	18.7	-	
Fall Time		t_f	V_{GS}=10V	-	17.6	-	
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	V_{DS}=400V	-	1.5	-	nC
Gate to Drain Charge		Q_{gd}	I_D=4A	-	3.1	-	
Gate Charge Total		Q_g	V_{GS}=0 to 10V	-	6.1	-	
Gate Plateau Voltage		$V_{Plateau}$		-	5.3	-	V
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_S=1A	-	0.8	1.3	V
Reverse Recovery Time		t_{rr}	V_R=400V	-	102	-	ns
Reverse Recovery Charge		Q_{rr}	I_S=4A	-	357	-	nC
Peak Reverse Recovery Current		I_{rrm}	di/dt=100A/us	-	5.7	-	A

Electrical Characteristics Diagrams

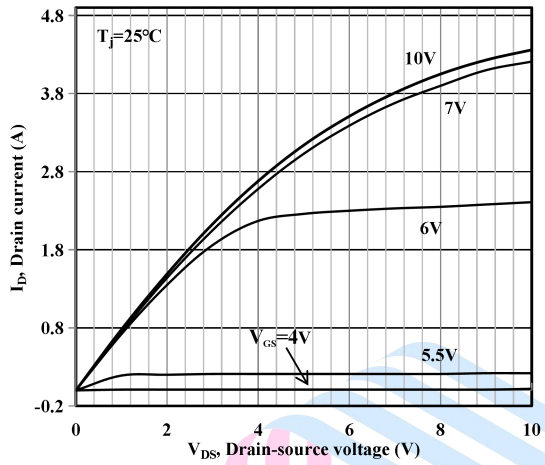


Figure 1. Typ. output characteristics

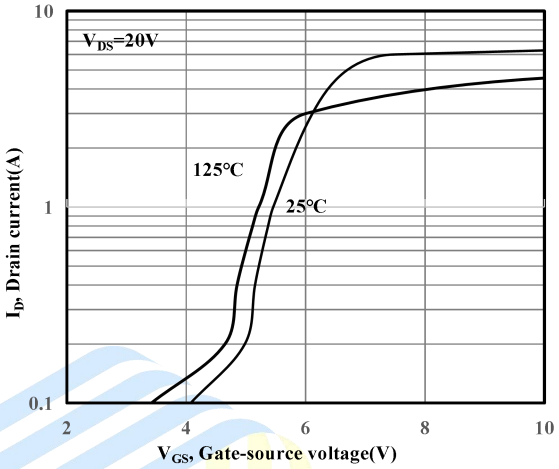


Figure 2. Typ. transfer characteristics

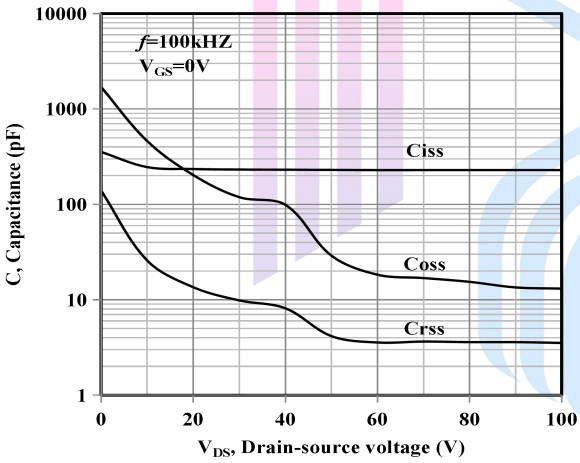


Figure 3. Typ. capacitances

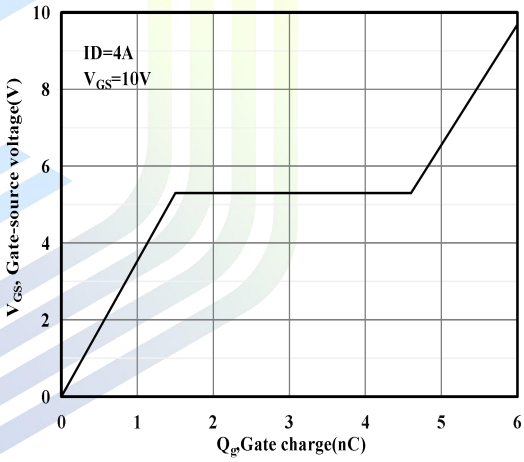


Figure 4. Typ. gate charge

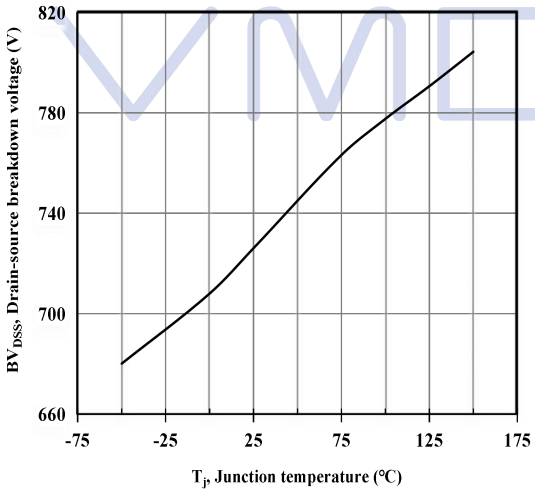


Figure 5. Drain-source breakdown voltage

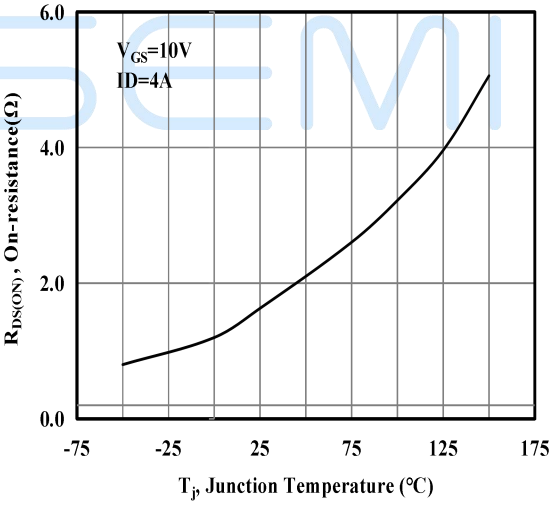


Figure 6. Drain-source on-state resistance

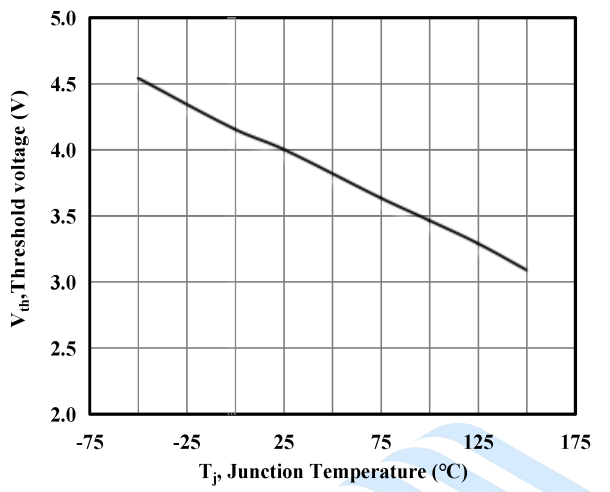


Figure 7. Threshold voltage

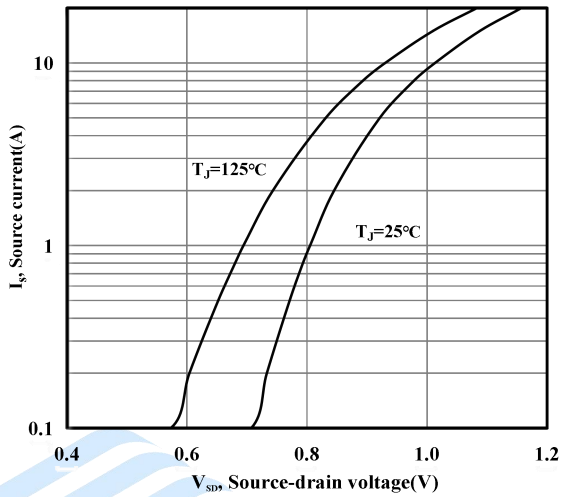


Figure 8. Forward characteristic of body diode

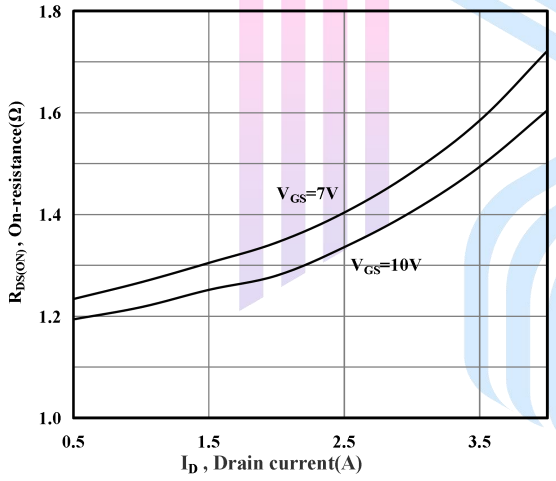


Figure 9. Drain-source on-state resistance

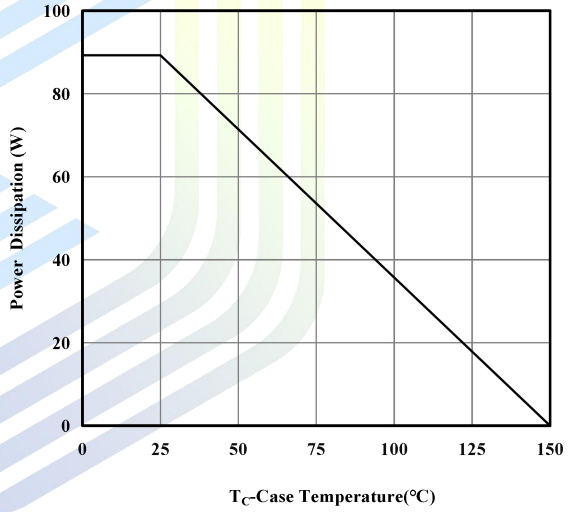


Figure 10. Power dissipation

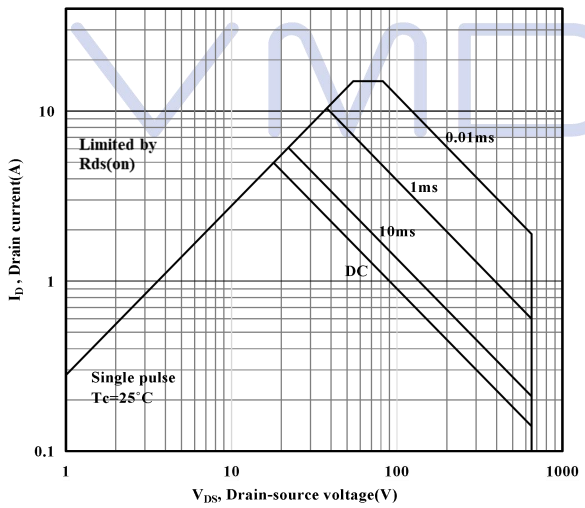


Figure 11. Safe operation area T_C=25℃

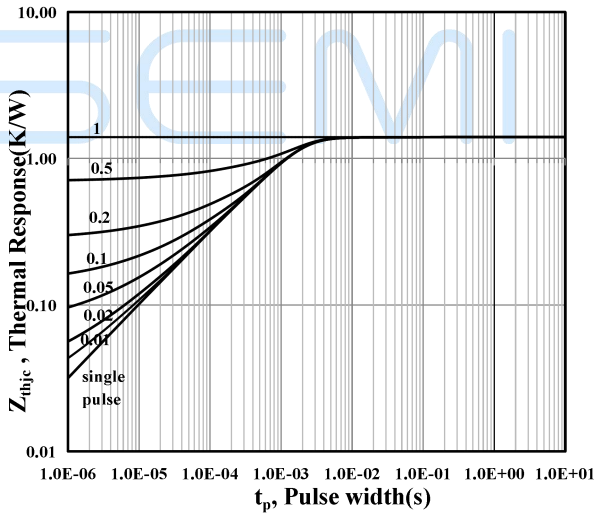
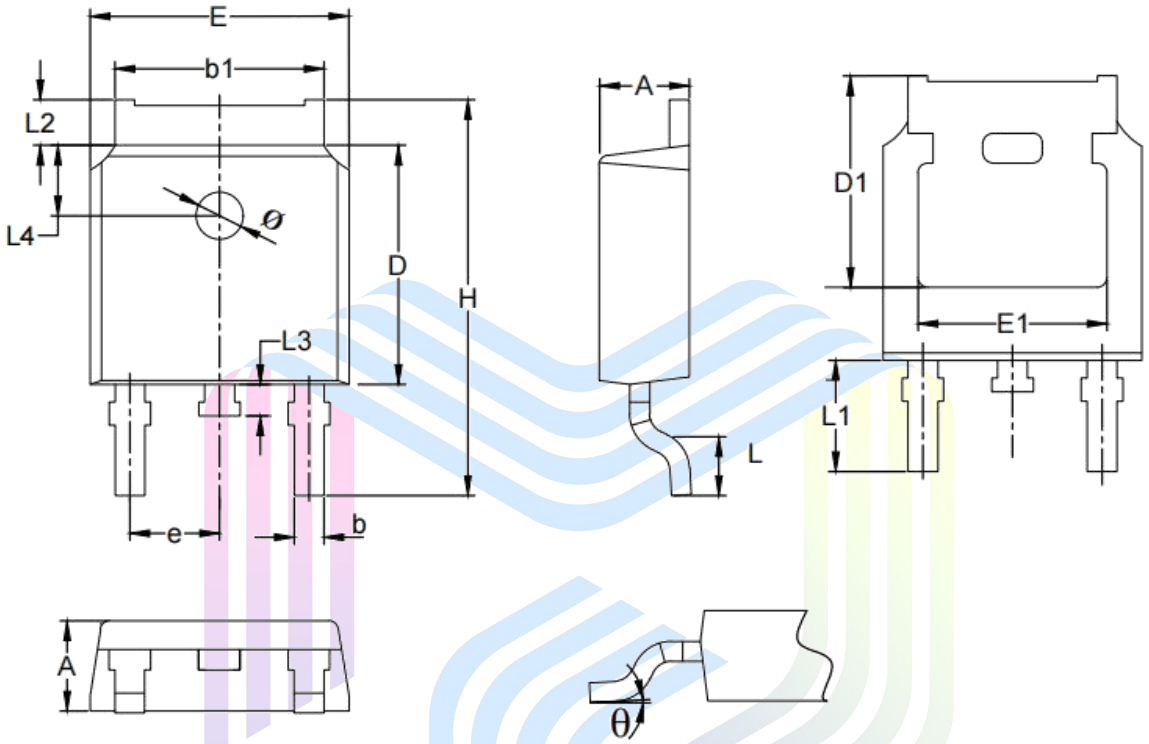


Figure 12. Max. transient thermal impedance

Mechanical Dimensions

TO-252 Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	MIN	MAX
A	2.2	2.4
A1	0	0.127
A2	–	–
b	0.66	0.9
b1	5.1	5.5
c	0.43	0.61
D	5.95	6.22
D1	5.3REF	
E	6.4	6.75
E1	4.8REF	
e	2.286BSC	
H	9.4	10.5
L	1.38	2
L1	2.9REF	
L2	0.88	1.28
L3	0.5	1
L4	1.8REF	
θ	0°	8°

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Via-Media Semiconductor Limited Company

http://www.vmdsemi.com

Main Sites:

- **Headquarters**

Hangzhou Via-Media Semiconductor Co., LTD.
1305-1306, Building 71, No. 90, Wensan Road, Xihu District, Hangzhou, Zhejiang Province, P.R. China
Tel: +86-0571-8515 0563

- **Chengdu Office**

Chengdu Winhi Semiconductor Co., LTD.
Floor 15, Building 5, No. 171, Hele 2nd Street, Chengdu, Sichuan Province, P.R. China
Tel: +86-028-8505 0771

- **Shanghai**

Shanghai R&D Center.
1506~1508, Xinyin Building, 888 Yishan Road, Shanghai, P.R of China

Tel: +86-021-54201999

- **Shenzhen**

Shenzhen Sales office .
Room 4A15, Block AB, Tianxiang Building, Chegongmiao, Futian District, Shenzhen, P.R of China
Tel: +86-0755-82570682

- **Xi'an**

Xi'an R&D Center
1703B, Building A, Greenland Center, Jinye Road, High-Tech Zone, Xi'an, Shaanxi, P.R of China