



VMDSEMI

VSTL065R19BNA

Datasheet

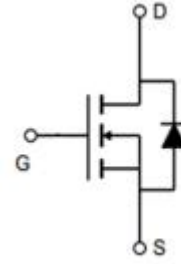


VMDSEMI

General Description

Symbol

$V_{(BR)DSS}$	$R_{DS(ON)_{max}}$	I_D
650V	1900mΩ@10V	2.7A



Symbol of VSTL065R19BNA

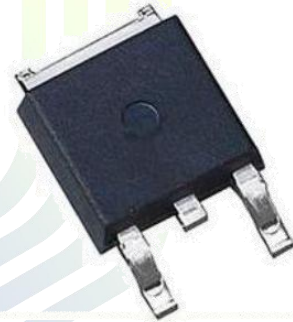
Features

- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent Reliability and Stability

Application

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

Package Type



TO-252
Package Type of VSTL065R19BNA

Ordering Information

Product Name	Package	Marking
VSTL065R19BNA	TO-252	L065R19BNA

Absolute Maximum Ratings ($T_J=25\text{ }^\circ\text{C}$, 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}	$T_C=25^\circ\text{C}$ I_D	2.7	A
Pulsed Drain Current ^{Note 2}	$T_C=25^\circ\text{C}$ $I_{D, pulse}$	8.1	A
Continuous Diode Forward Current ^{Note 1}	$T_C=25^\circ\text{C}$ I_S	2.7	A
Diode Pulsed Current ^{Note 2}	$T_C=25^\circ\text{C}$ $I_{S, pulse}$	8.1	A
Max Power Dissipation ^{Note 3}	$T_C=25^\circ\text{C}$ P_D	38	W
Avalanche Current, Single Pulse ^{Note 4}	I_{AS}	2.8	A
Avalanche Energy, Single Pulse ^{Note 4}	E_{AS}	78.4	mJ
MOSFET dv/dt ruggedness, $V_{DS}=0\sim 480\text{V}$	dv/dt	50	V/ns
Reverse diode dv/dt, $V_{DS}=0\sim 480\text{V}$, $I_{SD}\leq I_D$	dv/dt	15	V/ns
Operation and storage temperature	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	-	3.29	-	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient ^{Note 5}	$R_{\theta JA}$	-	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.

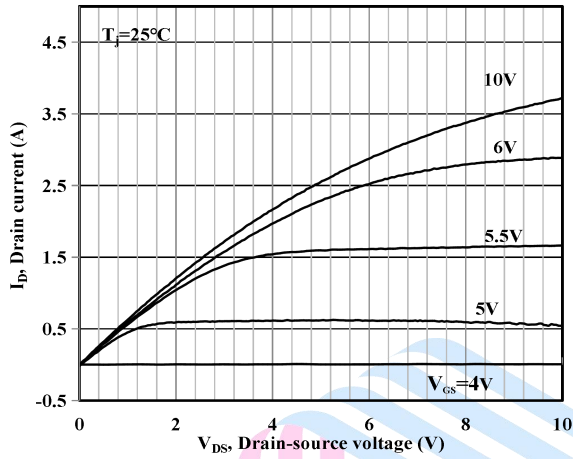
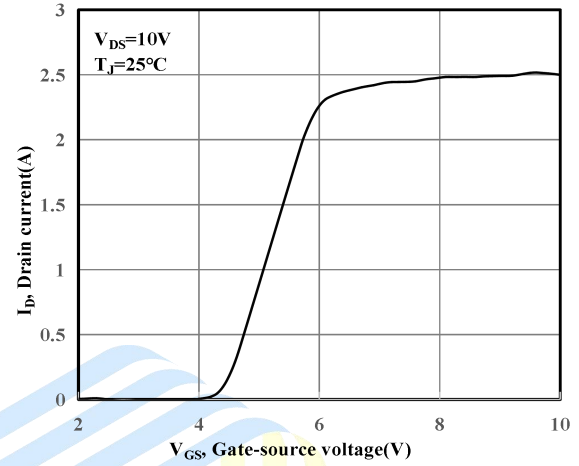
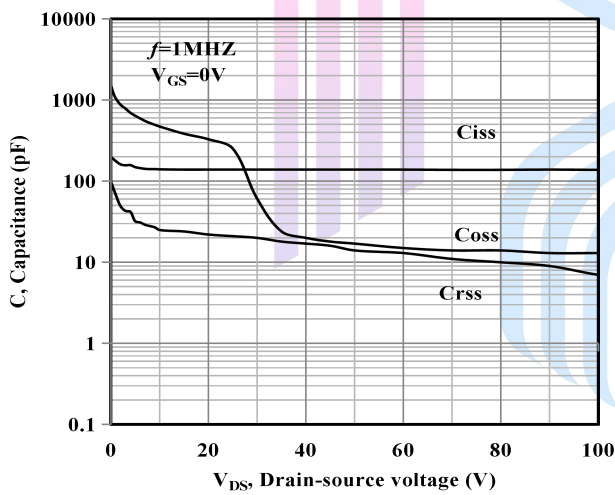
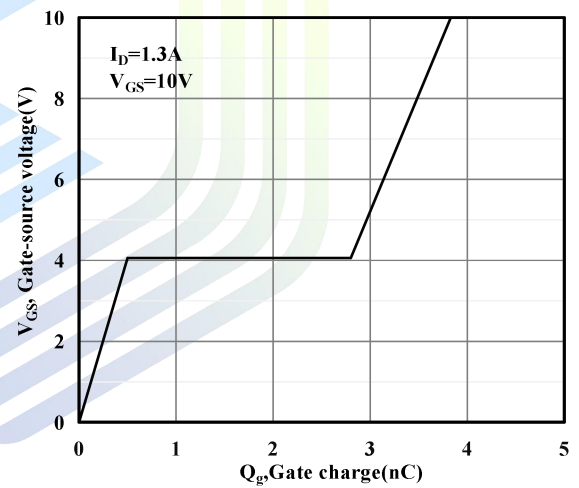
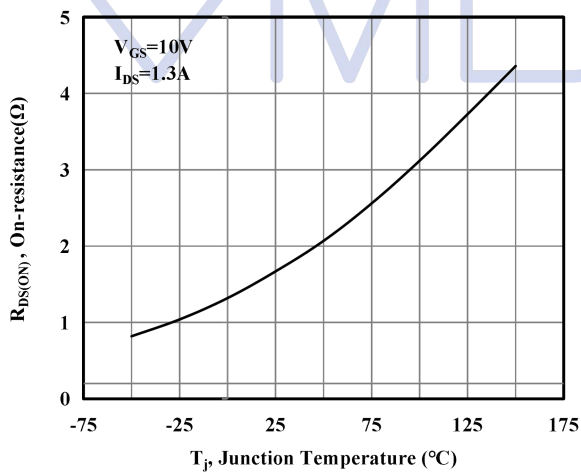
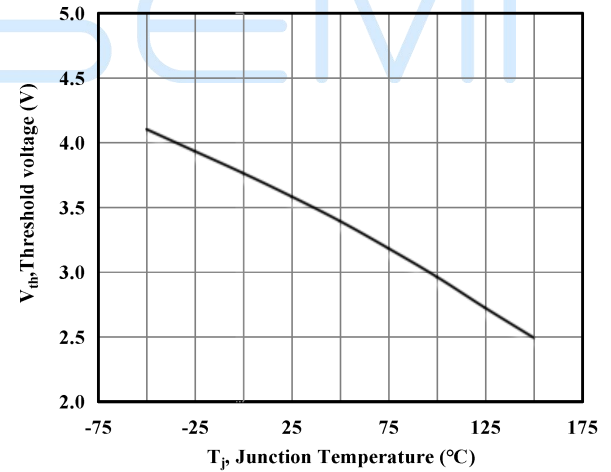
Note4: $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $L=20\text{mH}$, starting $T_J=25\text{ }^\circ\text{C}$.

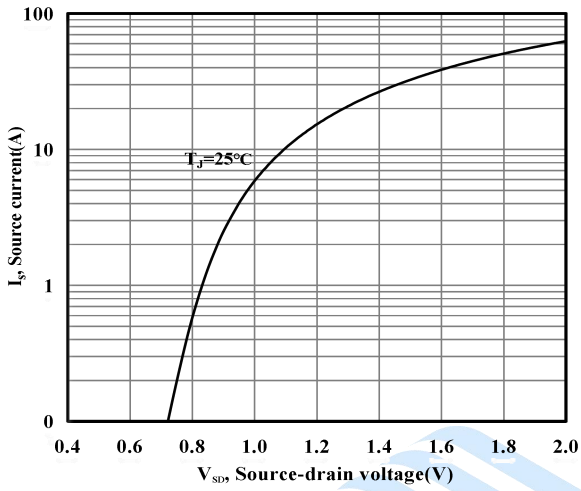
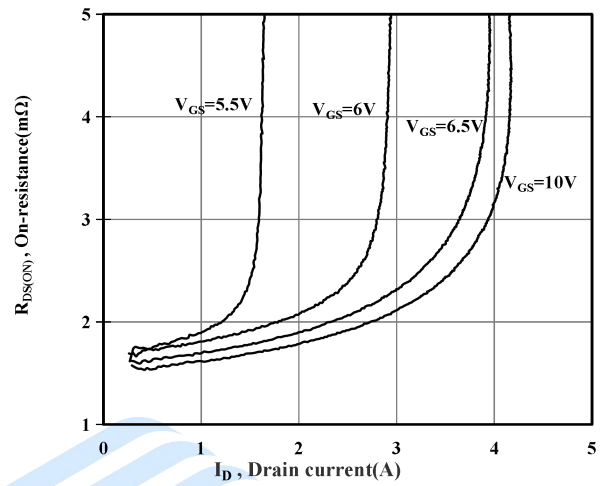
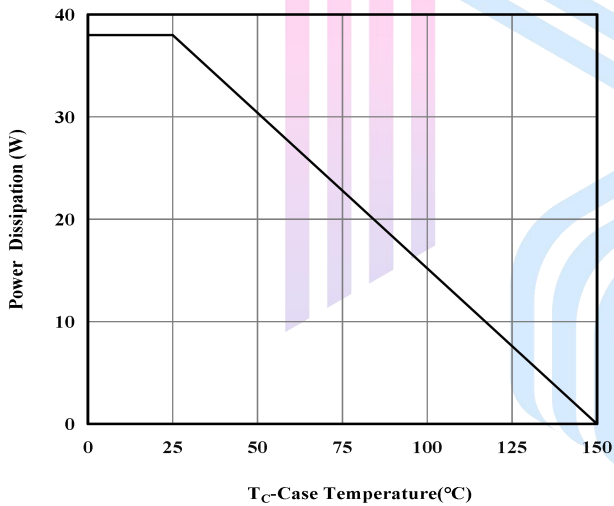
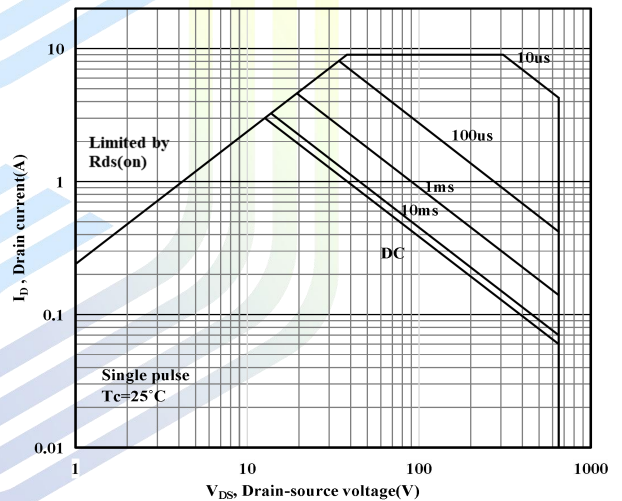
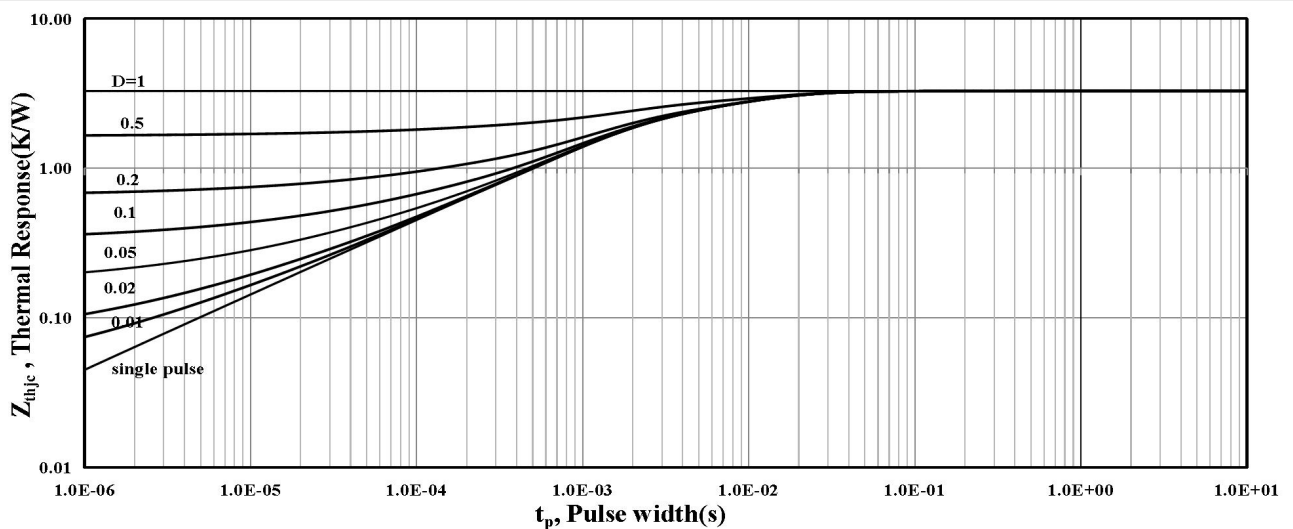
Note5: When mounted on 1 inch square copper board, $t\leq 10\text{sec}$. The value in any given application depends on the user's specific board design.

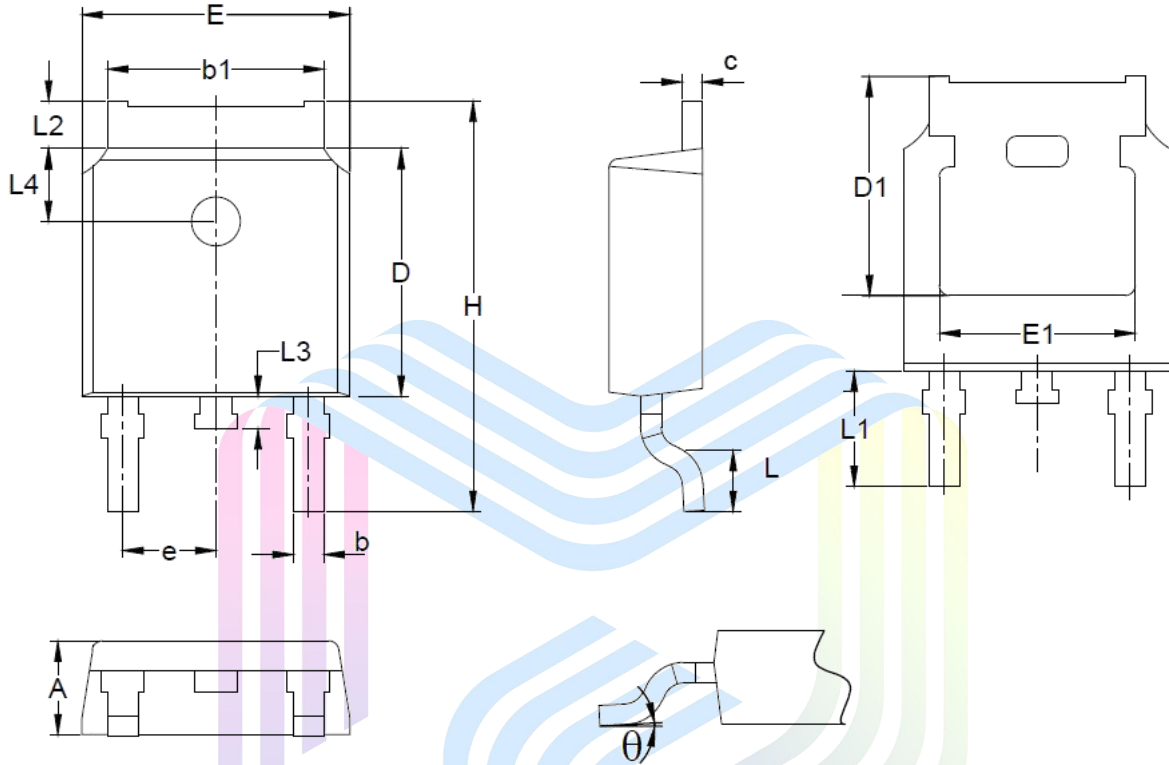
Electrical Characteristics ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	Forward	$I_{GSSF}, V_{GS}=30V, V_{DS}=0V$	-	-	100	nA
	Reverse	$I_{GSSR}, V_{GS}=-30V, V_{DS}=0V$	-	-	-100	
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.7	3.5	4.3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1.3A$	-	1730	1900	$m\Omega$
Gate Resistance	R_G	$F=1MHz, \text{Open Drain}$	-	15	-	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=50V$	-	139	-	pF
Output Capacitance	C_{oss}	$V_{GS}=0V$	-	17	-	pF
Reverse Transfer Capacitance	C_{rss}	$f=1MHz$	-	14	-	pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=400V$	-	6.68	-	ns
Rise Time	t_r	$I_D=1.3A$	-	16.88	-	
Turn-off Delay Time	$t_{d(off)}$	$R_G=2\Omega$	-	15.6	-	
Fall Time	t_f	$V_{GS}=10V$	-	28.61	-	
Gate Charge Characteristics						
Gate to Source Charge	Q_{gs}	$V_{DS}=400V$ $I_D=1.3A$ $V_{GS}=0 \text{ to } 10V$	-	0.5	-	nC
Gate to Drain Charge	Q_{gd}		-	2.3	-	
Gate Charge Total	Q_g		-	3.83	-	
Gate Plateau Voltage	$V_{plateau}$		-	4.06	-	V
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A$	-	0.8	1.1	V
Reverse Recovery Time	t_{rr}	$V_R=400V$	-	109.7	-	ns
Reverse Recovery Charge	Q_{rr}	$I_S=1.3A$	-	395	-	nC
Peak Reverse Recovery Current	I_{rrm}	$di/dt=100A/\mu s$	-	5.97	-	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 on-state resistance

Figure 6. Threshold voltage


Figure 7. Forward characteristic of body diode

Figure 8. Drain-source on-state resistance

Figure 9. Power dissipation

Figure 10. Safe operation area $T_c=25^\circ\text{C}$

Figure 11. Max. transient thermal impedance

Mechanical Dimensions
TO-252 Package Information


COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	MIN	MAX
A	2.2	2.4
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	
L	1.38	
L1	2.9REF	
L2	0.88	1.28
L3	0.5	1
L4	1.8REF	
θ	0°	8°

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