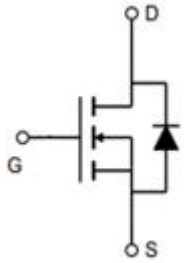
VSTA065R38ANA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
650V	380mΩ@10V	11A

Symbol

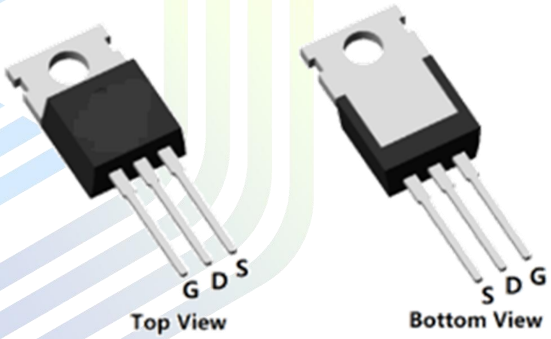


Symbol of VSTA065R38ANA

Features

- V_{DS}= 650V, I_D= 11A
- $R_{DS(ON)\_max}$ = 380mΩ@V_{GS} = 10V
- Extremely low switching loss
- Excellent stability and uniformity
- RoHS and Halogen-Free Compliant

Package Type



Package Type of VSTA065R38ANA

Application

- PC power
- LED lighting
- Telecom power
- Server power
- Solar/UPS

Ordering Information

Product Name	Package	Marking
VSTA065R38ANA	TO-220	STA065R38ANA

Absolute Maximum Ratings

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	11	A
Pulsed Drain Current Note 2, T_C=25ºC	$I_{D,\ pulse}$	33	A
Continuous Diode Forward Current Note 1, T_C=25ºC	I_S	11	A
Diode Pulsed Current Note 2, T_C=25ºC	$I_{S,\ pulse}$	33	A
Max Power Dissipation Note 3, T_C=25ºC	P_D	110	W
Avalanche Current, Single Pulse Note 4	I_{AS}	2.5	A
Avalanche Energy, Single Pulse Note4	E_{AS}	250	mJ
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	$R_{\theta JC}$		1.14		ºC/W
Thermal Resistance, Junction-to-Ambient Note5	$R_{\theta JA}$		62		

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=80mH, starting T_A=25 °C.

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

Electrical Characteristics(T_A= 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			100	nA
	Reverse	I_{GSSR}	V_{GS}=-30V, V_{DS}=0V			-100	
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	2.9		3.9	V
Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=5.5A		350	380	mΩ
Gate Resistance		R_G	F=1MHz, Open Drain		5.1		Ω
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS}=50V, V_{GS}=0V, f=1MHz		752		pF
Output Capacitance		C_{oss}			75		pF
Reverse Transfer Capacitance		C_{rss}			1.9		pF
Turn-on Delay Time		$t_{d(on)}$	V_{DS}=400V, I_D=6A, R_G=2Ω, V_{GS}=10V		10.9		ns
Rise Time		t_r			5.6		
Turn-off Delay Time		$t_{d(off)}$			32.6		
Fall Time		t_f			7.1		
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	V_{DS}=400V, I_D=6A, V_{GS}=0 to 10V		4.95		nC
Gate to Drain Charge		Q_{gd}			6.20		
Gate Charge Total		Q_g			17.52		
Gate Plateau Voltage		$V_{Plateau}$			5.72		V
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_S=1A		0.74		V
Reverse Recovery Time		t_{rr}	V_R=400V, I_S=6A, di/dt=100A/us		200.5		ns
Reverse Recovery Charge		Q_{rr}			1.86		uC
Peak Reverse Recovery Current		I_{rrm}			16.3		A

Electrical Characteristics Diagrams

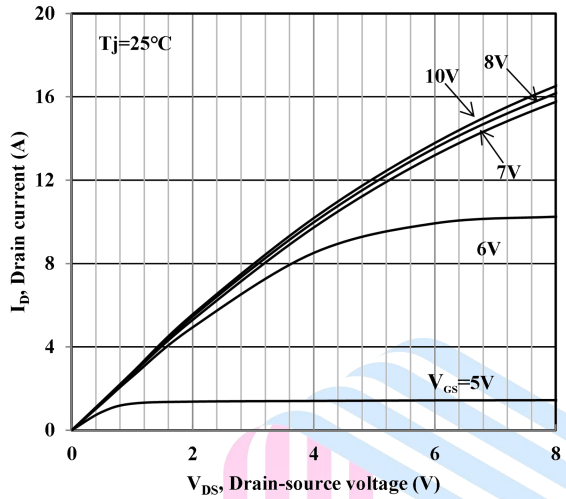


Figure 1. Typ. output characteristics

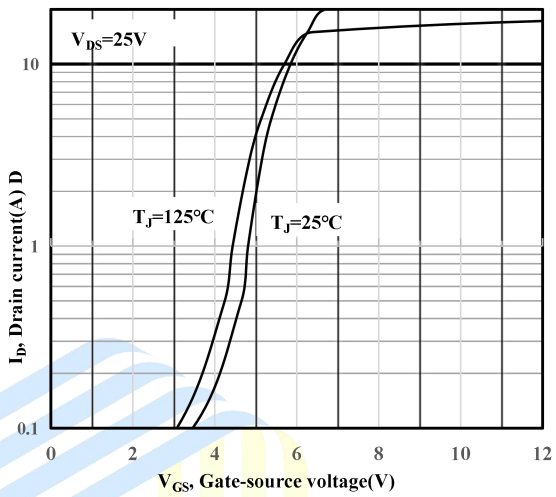


Figure 2. Typ. transfer characteristics

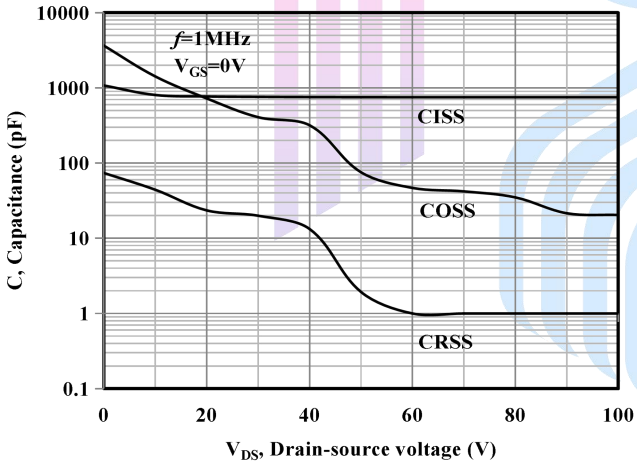


Figure 3. Typ. Capacitances

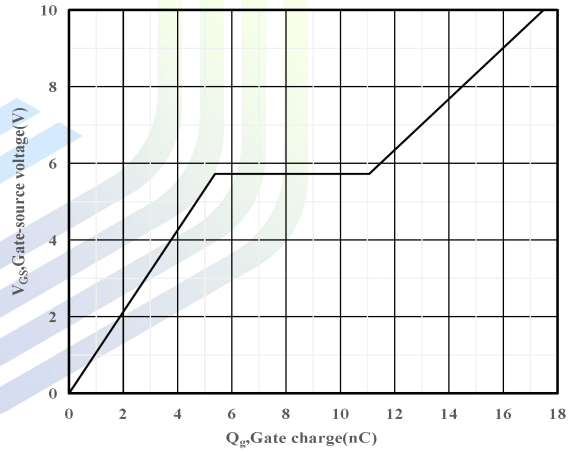


Figure 4. Typ. gate charge

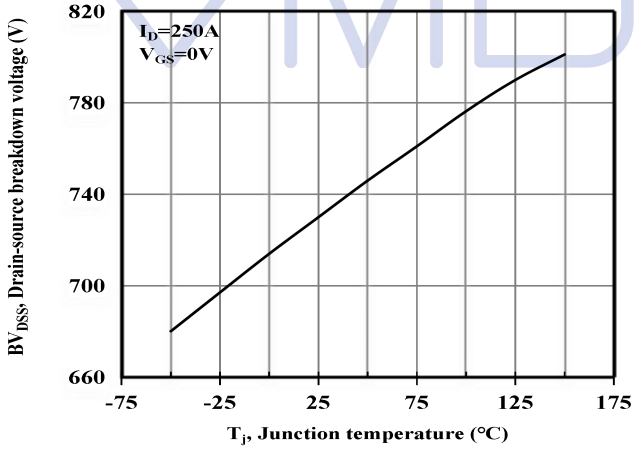


Figure 5. Drain-source breakdown voltage

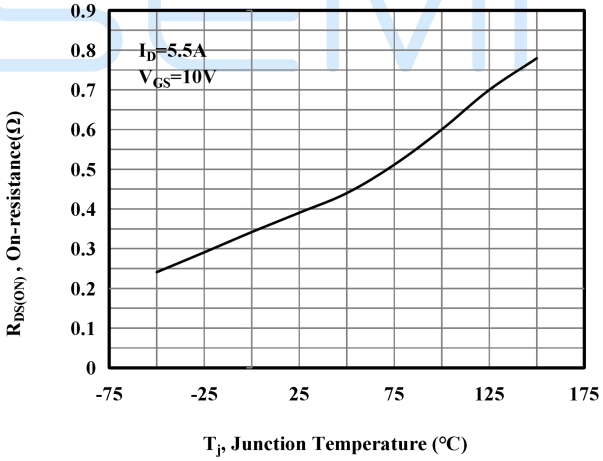


Figure 6. Drain-source on-state resistance

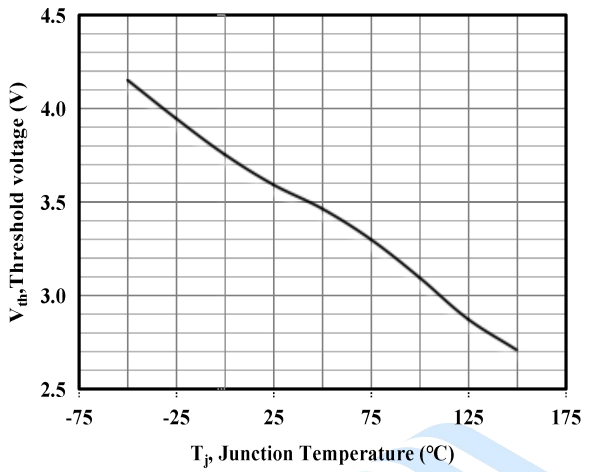


Figure 7. Threshold voltage

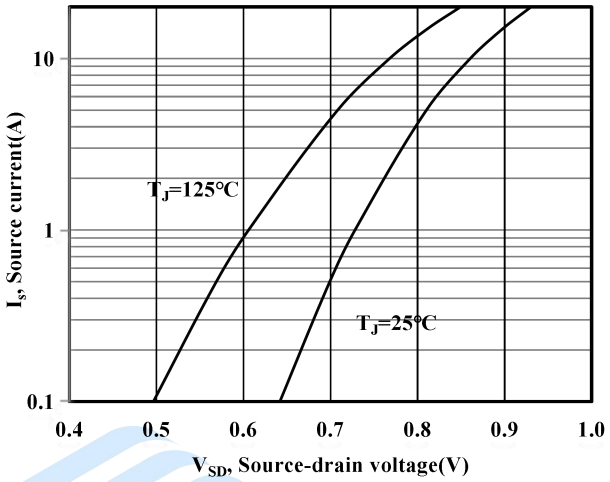


Figure 8. Forward characteristic of body diode

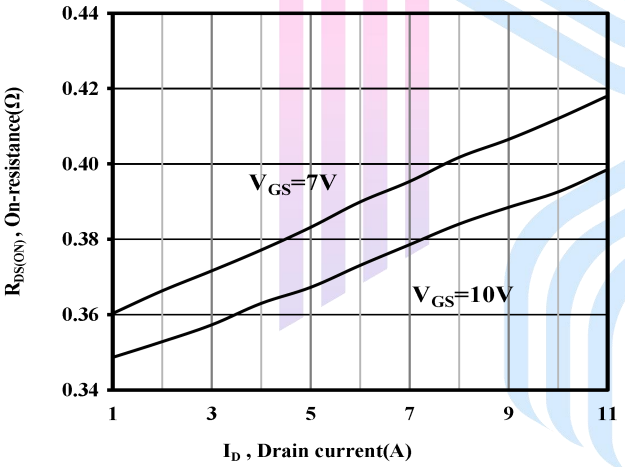


Figure 9. Drain-source on-state resistance

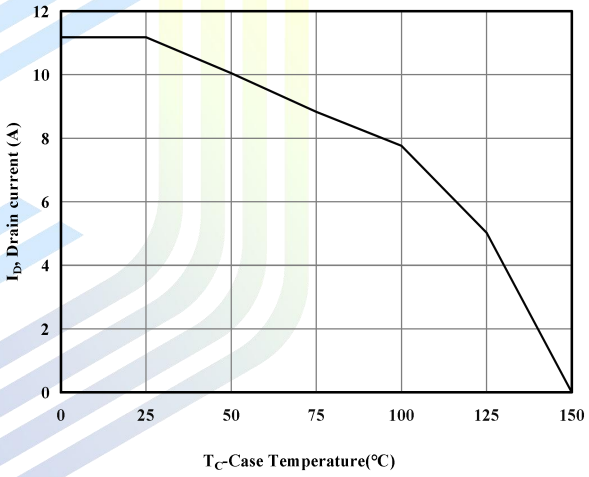


Figure 10. Drain current Derating

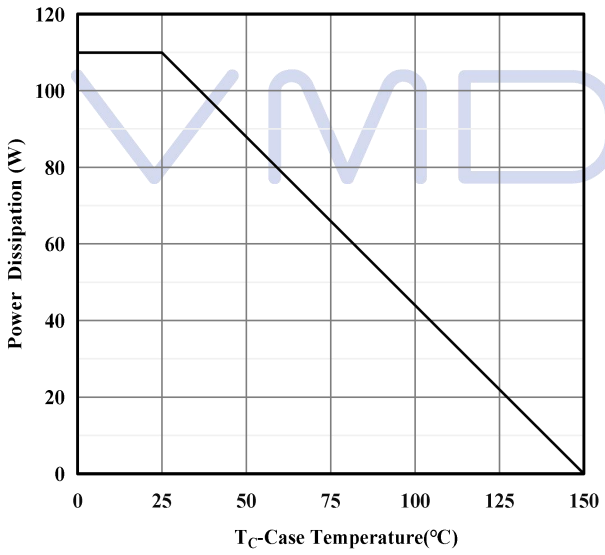


Figure 11. Power Dissipation

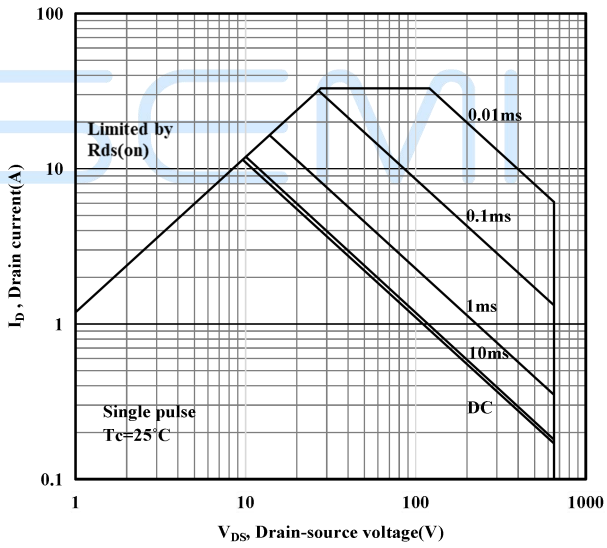


Figure 12. Safe operation area T_C=25 °C

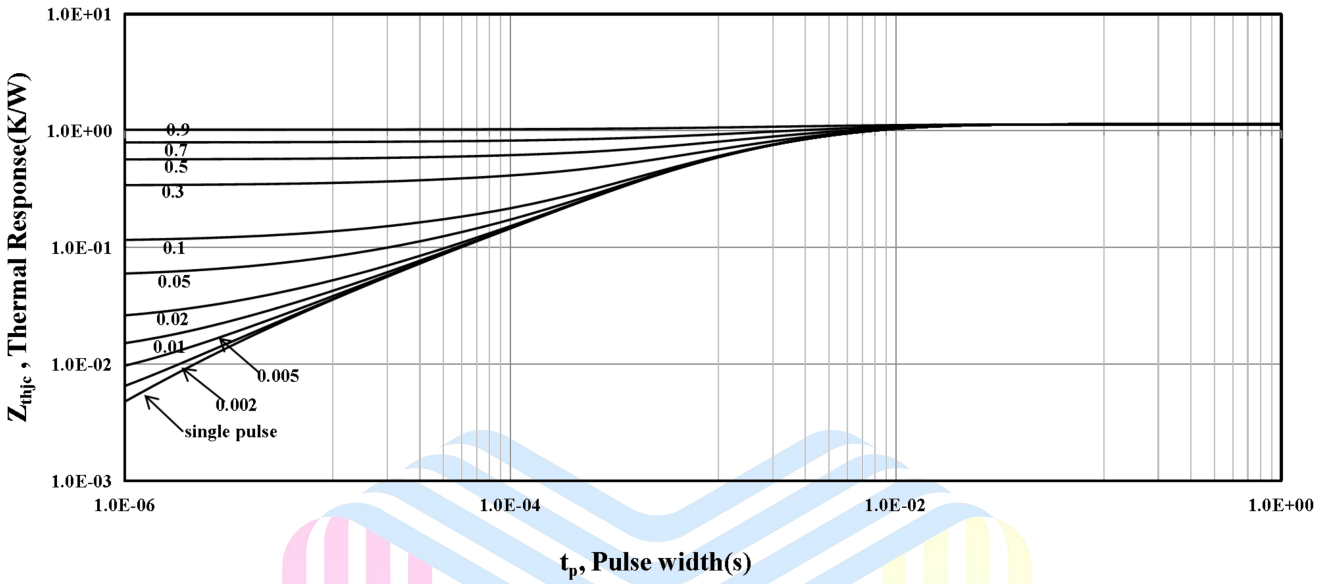
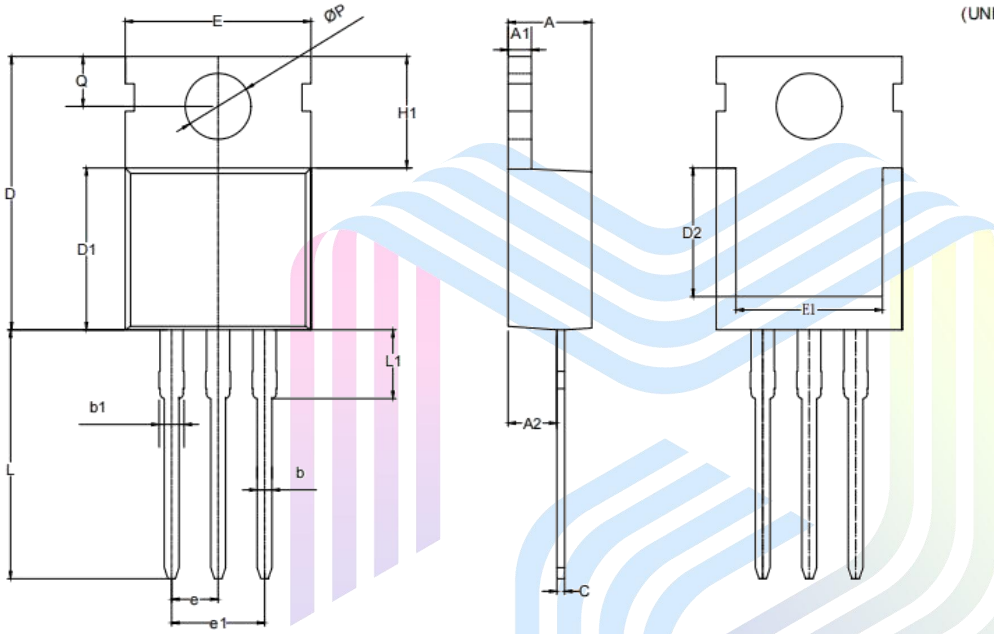


Figure 13. Max. transient thermal impedance

Mechanical Dimensions

TO-220 Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	MAX
A	4. 30	4. 70
Al	1. 20	1.40
A2	2. 20	2.60
b	0. 70	0.95
b1	1. 17	1.47
c	0.30	0. 70
D	15. 10	16. 10
D1	8. 80	9.40
D2	5. 50	-
E	9. 70	10. 30
E1	7.00	-
e	2. 54 BSC	
e1	5.08 BSC	
H1	6.25	6. 85
L	12. 60	13. 80
L1	-	3.40
Ø P	3. 40	3.80
Q	2. 60	3.00

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