VSTD065R58ANB

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
650V	580mΩ@10V	8A

Symbol

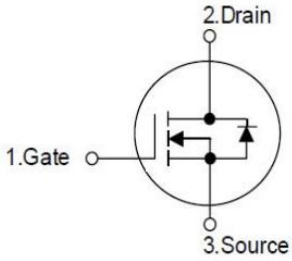
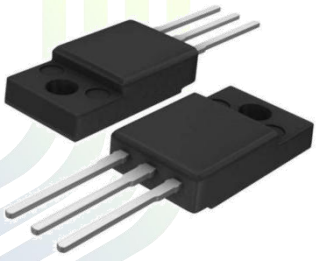


Figure 1 Symbol of VSTD065R58ANB

Features

- Low $R_{DS(ON)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity

Package Type



TO-220F

Figure 2 Package Type of VSTD065R58ANB

Application

- PC Power
- LED lighting
- Telecom Power
- Server Power
- EV Charger
- Solar/UPS

Ordering Information

Product Name	Package
VSTD065R58ANB	TO-220F

Absolute Maximum Ratings

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	650	V
Gate-Source Voltage		V_{GSS}	±30	V
Continuous Drain Current Note 1	T_C=25ºC	I_D	8	A
Continuous Drain Current Note 1	T_C=100ºC		5	A
Pulsed Drain Current Note 2	T_C=25ºC	$I_{D.pulse}$	24	A
Continuous Diode Forward Current Note 1	T_C=25ºC	I_S	8	A
Diode Pulse Current Note 2	T_C=25ºC	$I_{S.pulse}$	24	A
Max Power Dissipation Note 3	T_C=25ºC	P_D	28	W
Avalanche Energy, Single Pulse Note 5		E_{AS}	150	mJ
MOSFET dv/dt ruggedness, VDS=0…480 V		dv/dt	50	V/ns
Reverse diode dv/dt, VDS=0…480 V, 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	$R_{θJC}$		4.5		ºC/W
Thermal Resistance, Junction-to-Ambient Note4	$R_{θJA}$		62.5		

Notes:

1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) P_D is based on max. junction temperature, using junction-case thermal resistance.
4) The value of $R_{θJA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25 °C.
5) V_{DD}=50 V,V_{GS}=10 V, L=10.8mH, starting T_J=25 °C.

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
			V_{GS}=0V, I_D=250uA,T_J=150 °C	700	750		V
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS}=650V, V_{GS}=0V			1	uA
Gate-Body 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	2.0		4.0	V
Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=4A		0.52	0.58	Ω
Drain-Source On-Resistance	T_J= 150 ºC				1.27		
Gate resistance		R_G	f=1 MHz, Open drain		4.0		Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=50V		464		pF
Output Capacitance		C_{OSS}	V_{GS}=0V		38.3		pF
Reverse Transfer Capacitance		C_{RSS}	f=1MHz		1.47		pF
Turn-on Delay Time		$t_{d(on)}$	V_{DS}=380V		18		ns
Rise Time		t_r	I_D=8A		18		
Turn-off Delay Time		$t_{d(off)}$	R_G=25Ω		27		
Fall Time		t_f	V_{GS}=10V		22		
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	V_{GS}=10V V_{DS}=480V I_D=8A		2.7		nC
Gate to Drain Charge		Q_{gd}			3.8		
Gate Charge Total		Q_g			9.5		
Gate Plateau Voltage		$V_{Plateau}$			5.6		V
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_S=8A			1.3	V
Reverse Recovery Time		t_{rr}	I_S=8A		211		ns
Reverse Recovery Charge		Q_{rr}	V_R=400V		1.8		nC
Peak Reverse Recovery Current		I_{rrm}	di/dt=100A/us		10.5		A

Typical Performance Characteristics

Figure 3: Typ. Output Characteristics

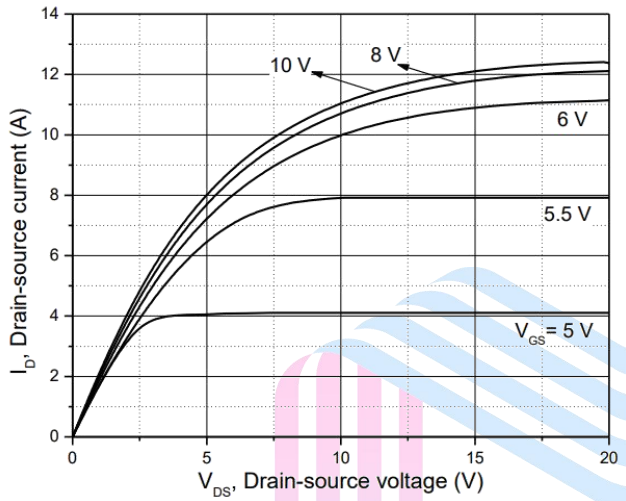


Figure 4: Drain-Source On-State Resistance

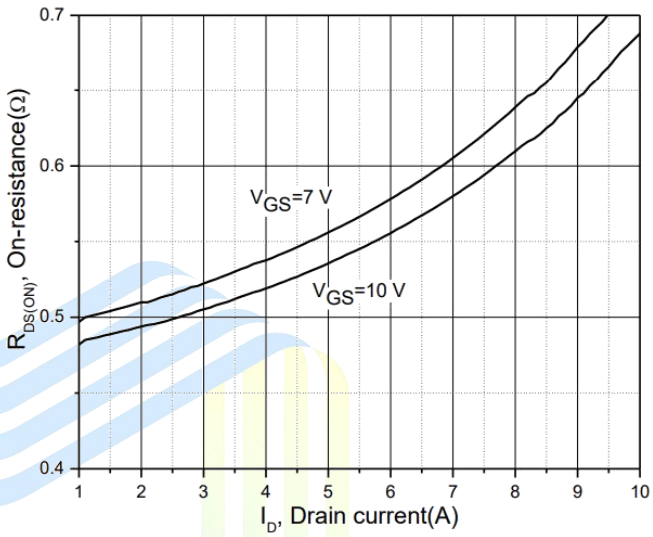


Figure 5: Typ. Drain-Source On-State Resistance

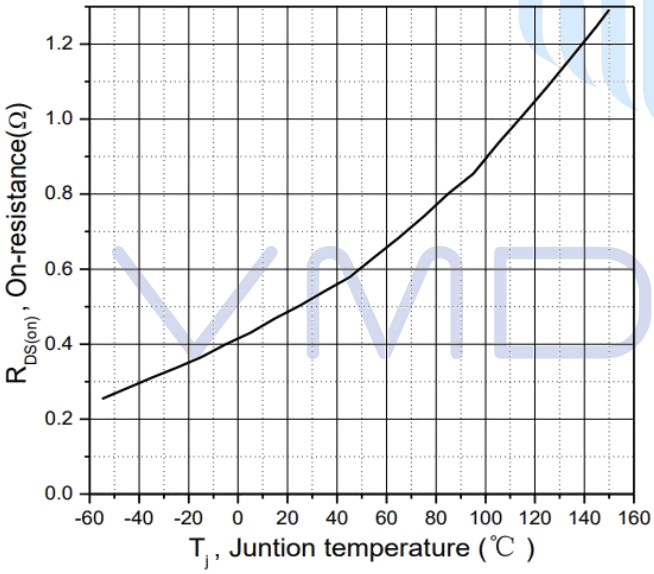


Figure 6: Typ. Transfer Characteristics

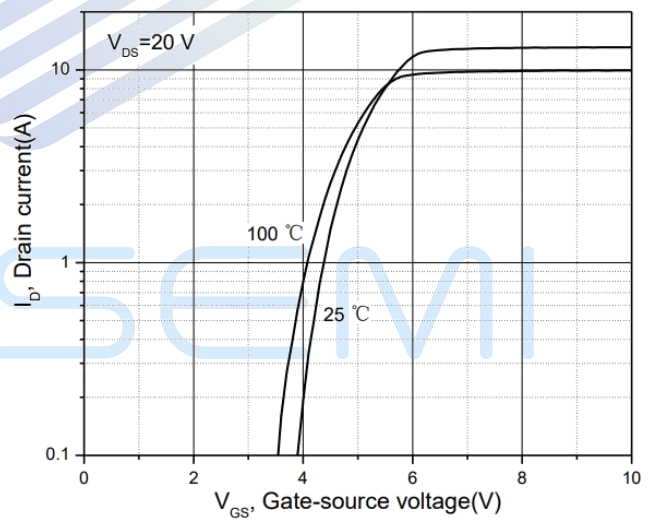


Figure 7: Drain-Source breakdown voltage

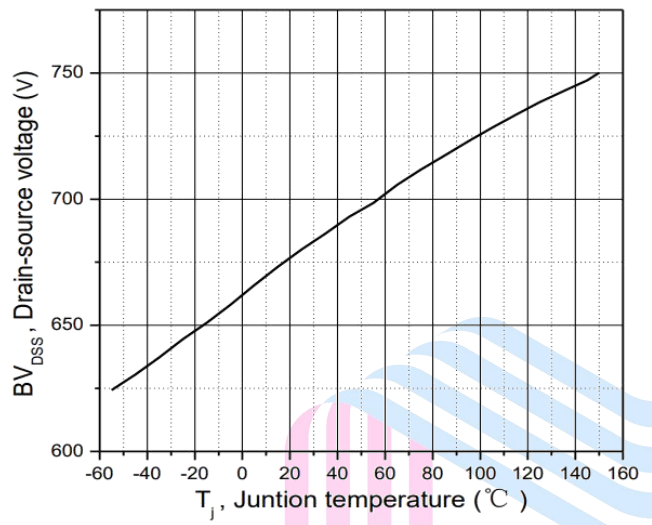


Figure 8: Typ. Gate Charge

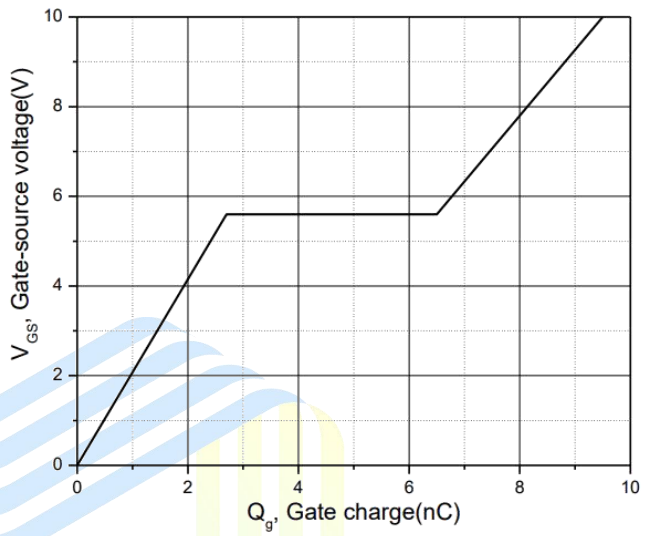


Figure 9: Typ. Capacitances

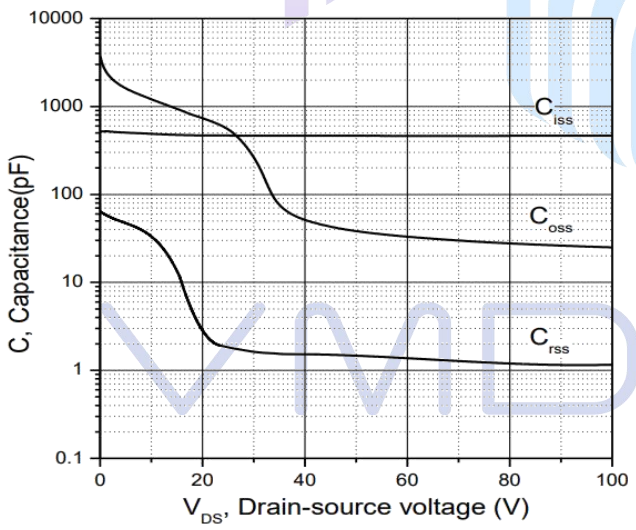


Figure 10: Forward Characteristics of Body Diode

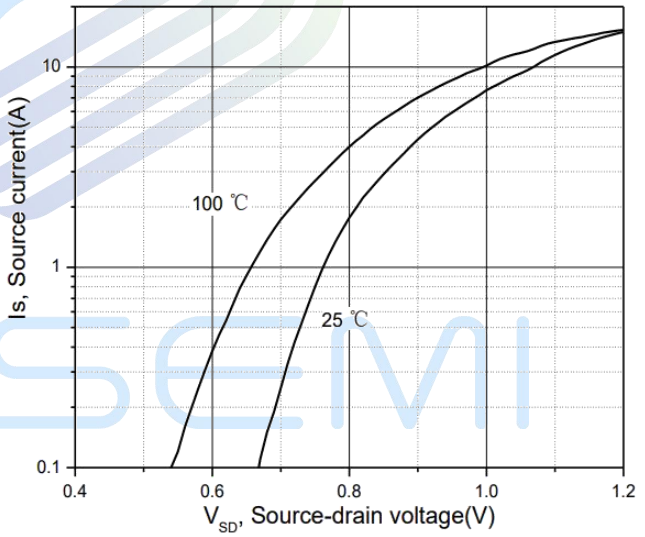


Figure 11: Drain Current

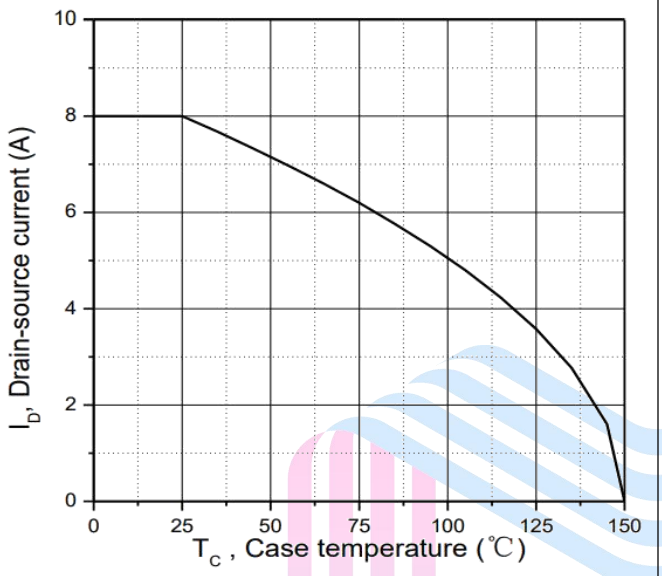
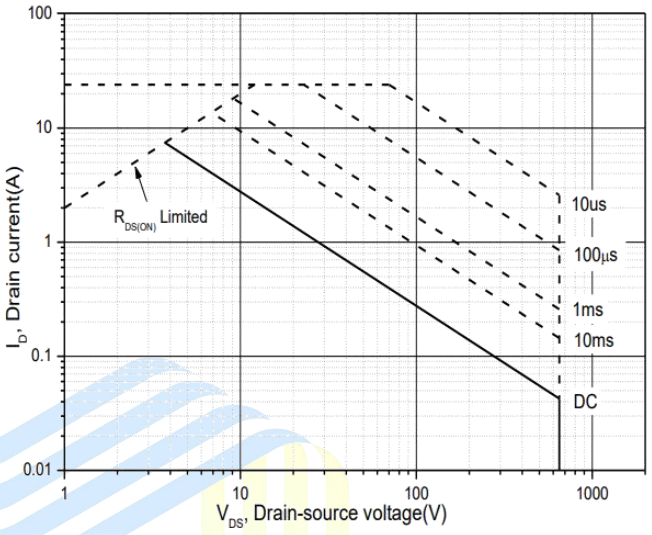
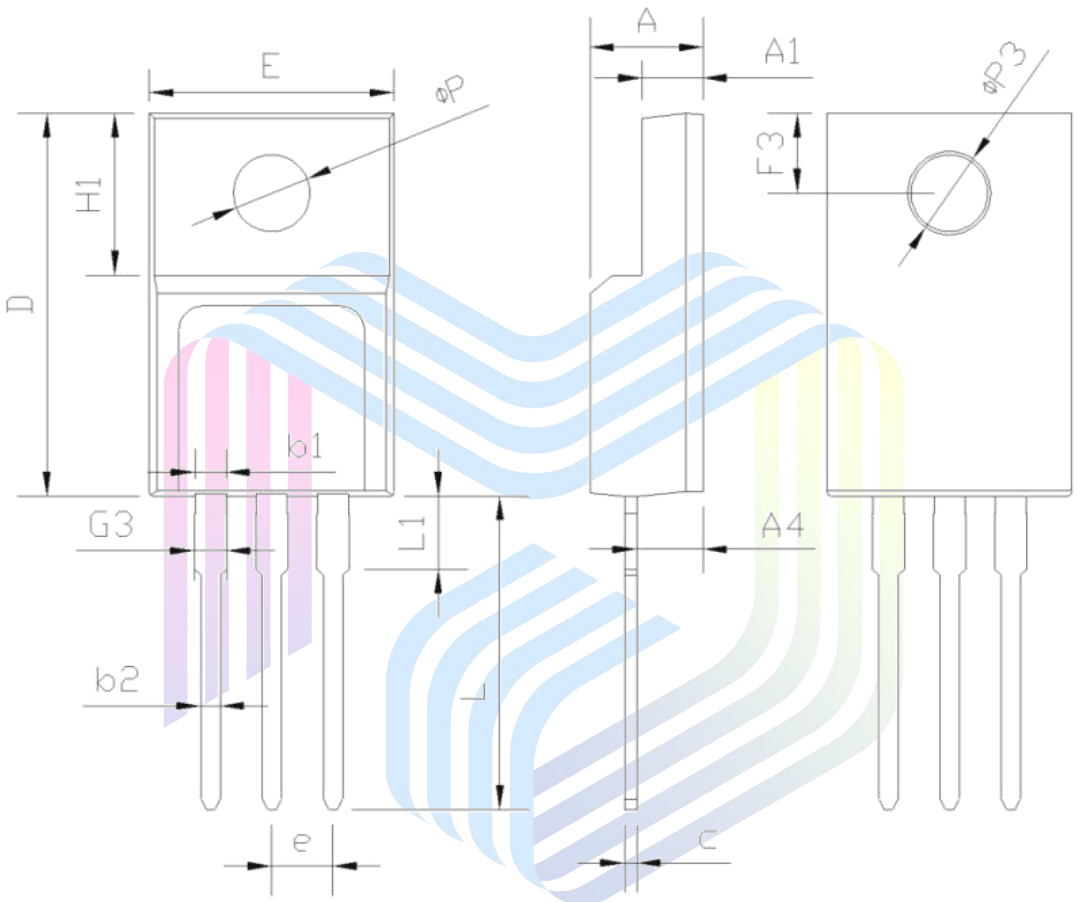


Figure 12: Safe Operating Area T_c= 25 ºC



Mechanical Dimensions

Package Information TO220-F



Symbol	Dimensions(mm)			Symbol	Dimensions(mm)		
	Min.	Typ.	Max.		Min.	Typ.	Max.
E	9.96	10.16	10.36	L	12.68	12.98	13.28
A	4.50	4.70	4.90	L1	2.88	3.03	3.18
A1	2.34	2.54	2.74	ΦP	3.03	3.18	3.38
A4	2.56	2.76	2.96	ΦP3	3.15	3.45	3.65
c	0.40	0.50	0.65	F3	3.15	3.30	3.45
D	15.57	15.87	16.17	G3	1.25	1.35	1.55
H1	6.70REF			b1	1.18	1.28	1.43
e	2.54BSC			b2	0.70	0.80	0.95

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