VUTP010R055NA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
100V	5.5mΩ@10V	130A

Symbol

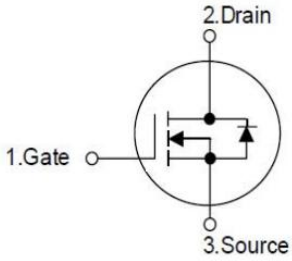
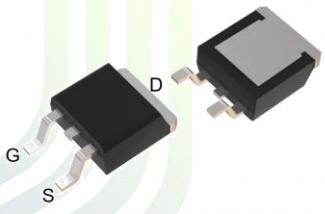


Figure 1 Symbol of VUTP010R055NA

Features

- Low $R_{DS(ON)}$
- 100% Avalanche Tested
- Enhancement mode

Package Type



TO-263

Figure 2 Package Type of VUTP010R055NA

Application

- PD charger
- Motor driver
- Switching voltage regulator
- DC-DC converter
- Switched mode power supply

Ordering Information

Product Name	Package
VUTP010R055NA	TO-263

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

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±25	V
Continuous Drain Current (Silicon limited)	T_C=25ºC	I_D	200	A
Continuous Drain Current (Wire Bond limited)	T_C=25ºC		130	
Continuous Drain Current (Silicon limited)	T_C=100ºC		142	
Pulsed Drain Current[Note 2]	T_C=25ºC	$I_{D.pulse}$	800	A
Continuous Diode Forward Current	T_C=25ºC	I_S	200	A
Continuous Drain Current	T_A=25ºC	I_{DSM}	15	A
Continuous Drain Current	T_A=70ºC		12	A
Max Power Dissipation	T_C=25ºC	P_D	375	W
Max Power Dissipation[Note 3]	T_A=25ºC	P_{DSM}	2	W
Avalanche Energy, Single Pulse [Note 4]		E_{AS}	900	mJ
Operation and storage temperature		T_J,T_{STG}	-55 to 175	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{θJC}$		0.4	0.5	ºC/W
Thermal Resistance, Junction-to-Ambient	$R_{θJA}$		62.5	75	

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	100			V
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	uA
Zero Gate Voltage Drain Current T_J= 125 ºC			V_{DS}=100V, V_{GS}=0V			100	uA
Gate-Body Leakage Current	Forward	I_{GSSF}	V_{GS}=25V, V_{DS}=0V			100	nA
	Reverse	I_{GSSR}	V_{GS}=-25V, V_{DS}=0V			-100	
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	2.4	3	3.6	V
Drain-Source On-Resistance[Note1]		$R_{DS(ON)}$	V_{GS}=10V, I_D=80A		4.5	5.5	mΩ
Drain-Source On-Resistance[Note1] T_J= 100 ºC					6.5		
Gate resistance		R_G	f=1 MHz, Open drain	0.2	2.3	5	Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=30V	11065	14755	19625	pF
Output Capacitance		C_{OSS}	V_{GS}=0V	500	665	885	pF
Reverse Transfer Capacitance		C_{RSS}	f=1MHz	370	495	660	pF
Turn-on Delay Time		$t_{d(on)}$	V_{DS}=50V		35		ns
Rise Time		t_r	I_D=40A		67		
Turn-off Delay Time		$t_{d(off)}$	R_G=3Ω		128		
Fall Time		t_f	V_{GS}=10V		64		
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	V_{GS}=10V		59	78	nC
Gate to Drain Charge		Q_{gd}	V_{DS}=50V		60	90	
Gate Charge Total		Q_g	I_D=40A		232	309	
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_{SD}=80A		0.9	1.2	V
Reverse Recovery Time		t_{rr}	I_{SD}=40A V_{GS}=0V		44	88	ns
Reverse Recovery Charge		Q_{rr}	di/dt=100A/us		77	154	nC

Notes:

1. Pulse width≤380μs; duty cycle≤ 2%.
2. Repetitive rating;pulse width limited by max junction temperature.
3. The power dissipation P_{DSM} is based on $R_{\theta JA}$ and @T_J = 125°C
4. Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 60A, V_{GS} =10V.

Typical Performance Characteristics

Figure 3: Typ. Output Characteristics

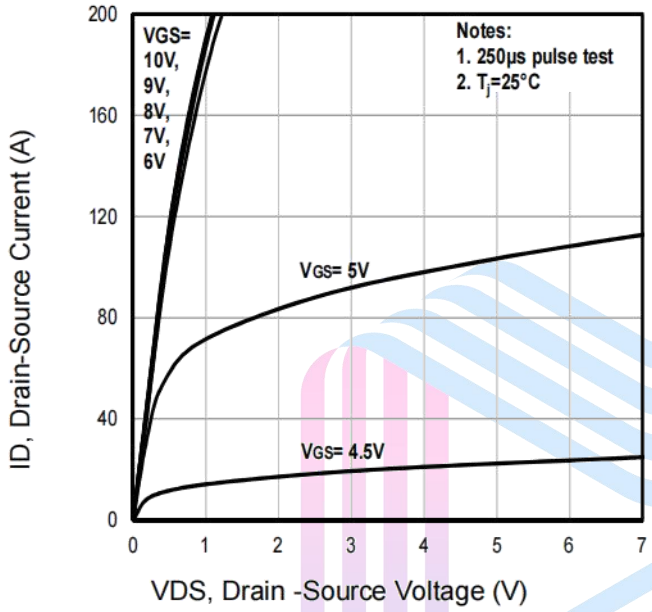


Figure 4: Typ. Gate Charge

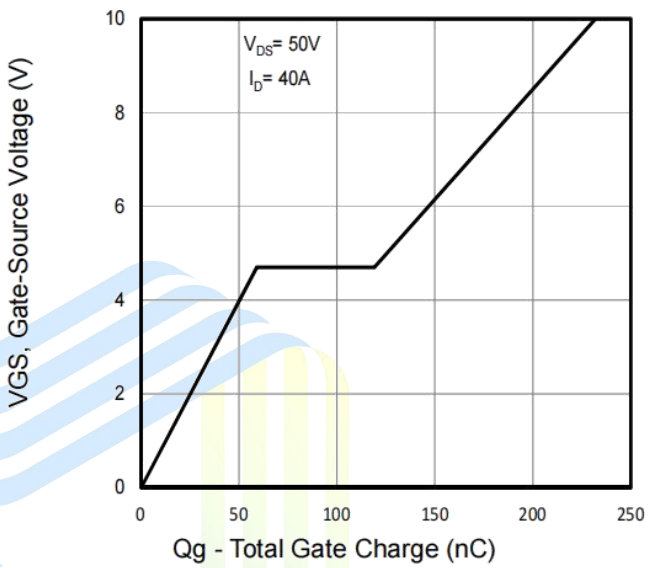


Figure 5: Normalized On-State Resistance

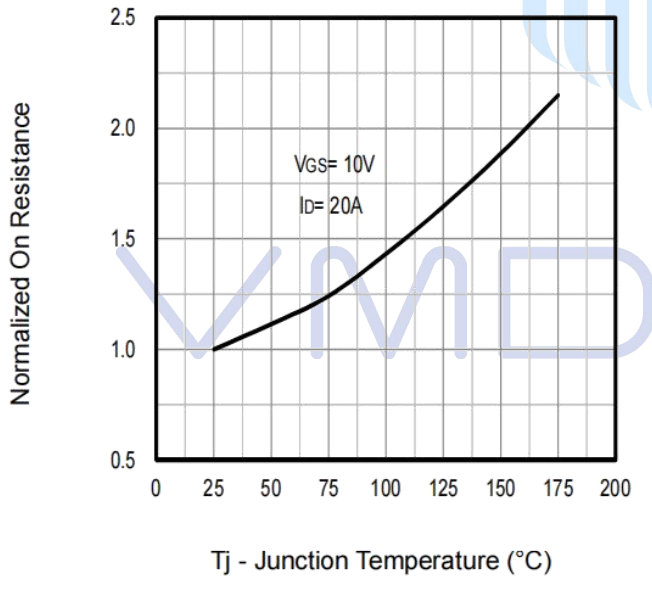


Figure 6: Typ. Transfer Characteristics

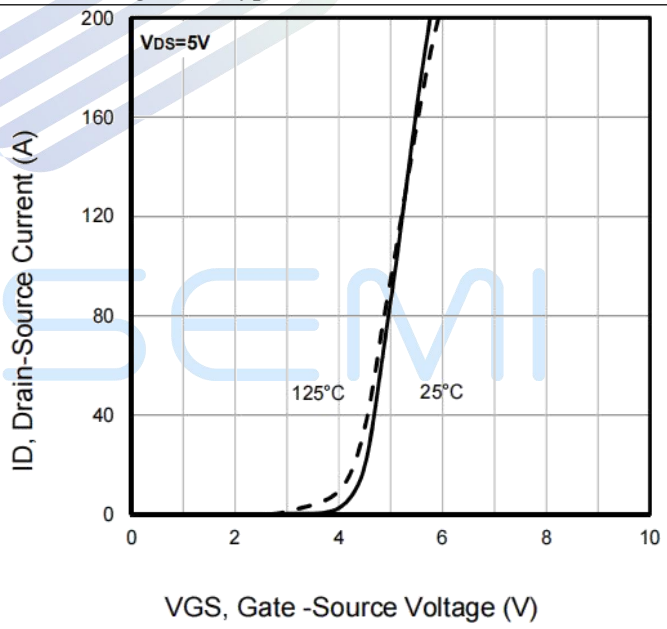


Figure 7: Typ. Capacitances

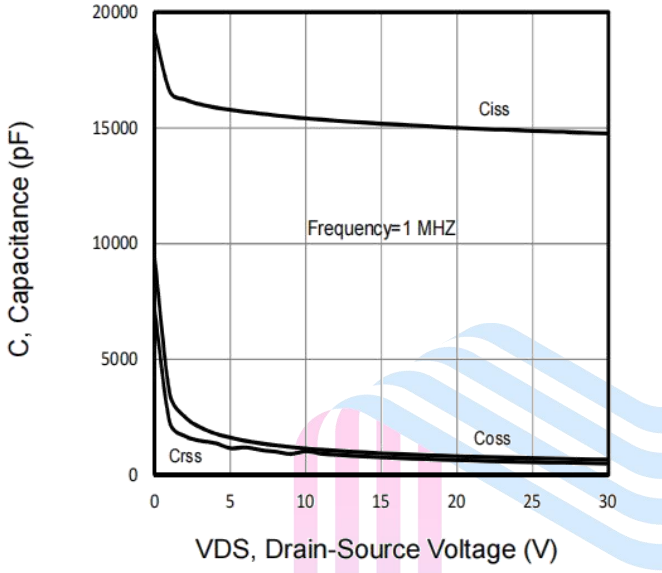


Figure 8: Forward Characteristics of Body Diode

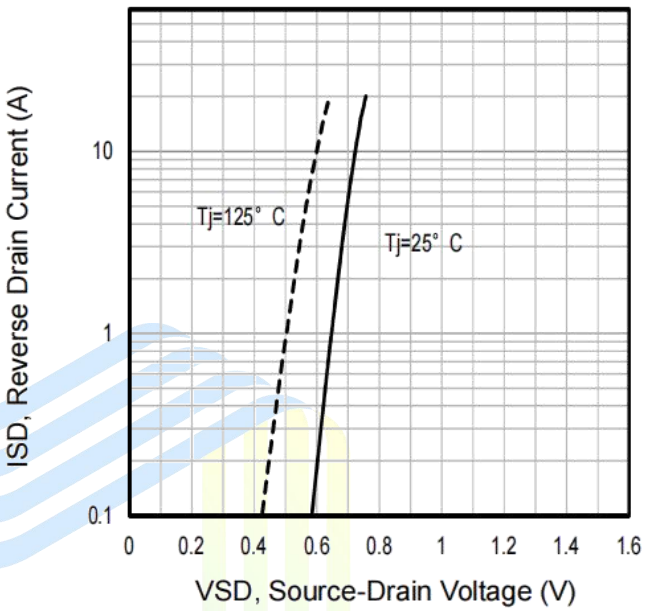


Figure 9: Gate-Source Threshold Voltage

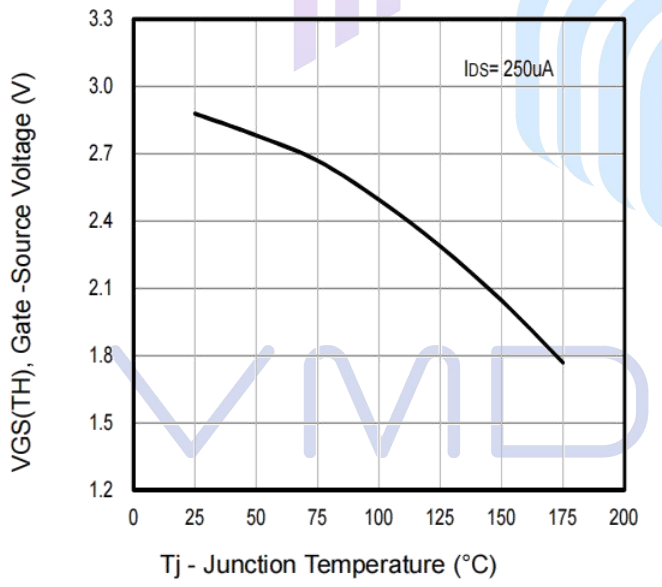


Figure 10: Safe Operating Area

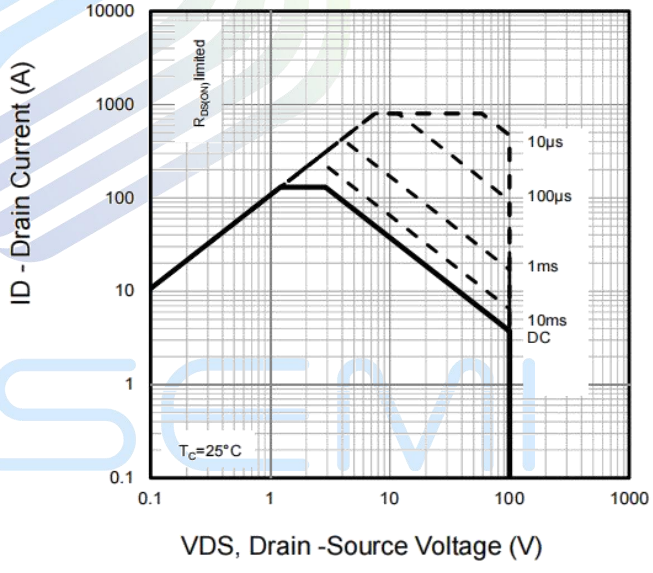


Figure 11: On Resistance Vs Gate -Source Voltage

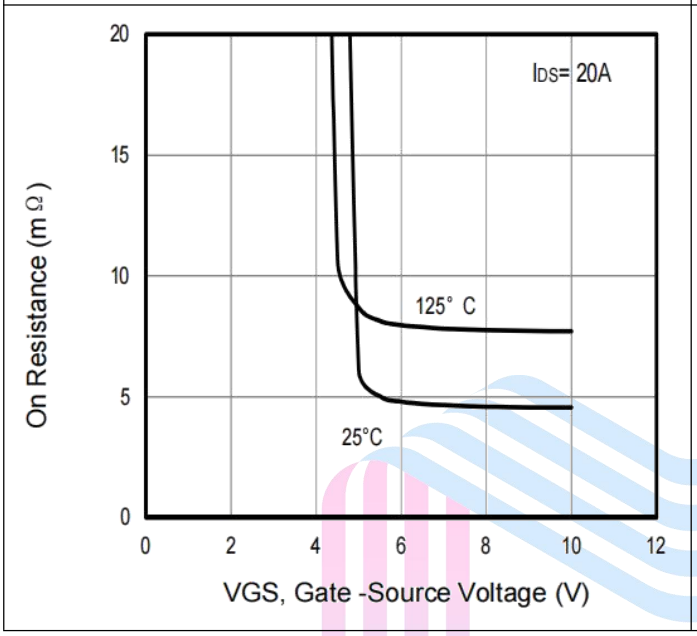


Figure 12: On Resistance Vs Drain Current and Gate Voltage

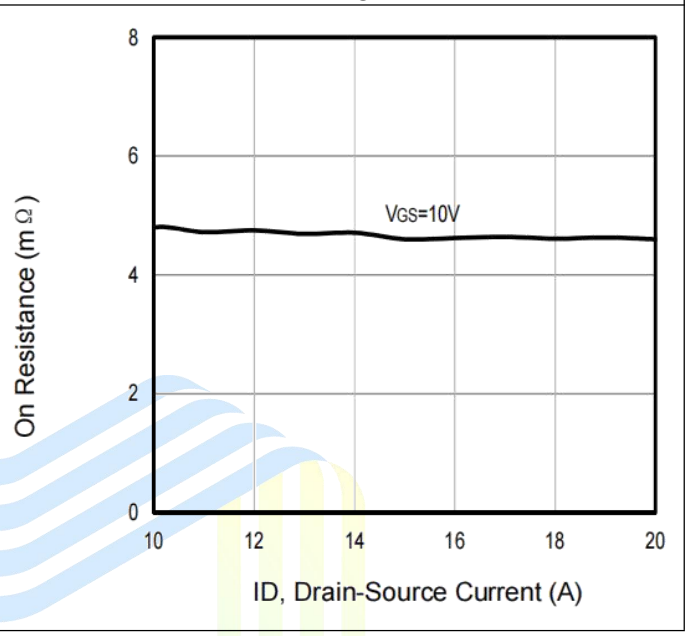


Figure 13: Power Dissipation Vs. Case Temperature

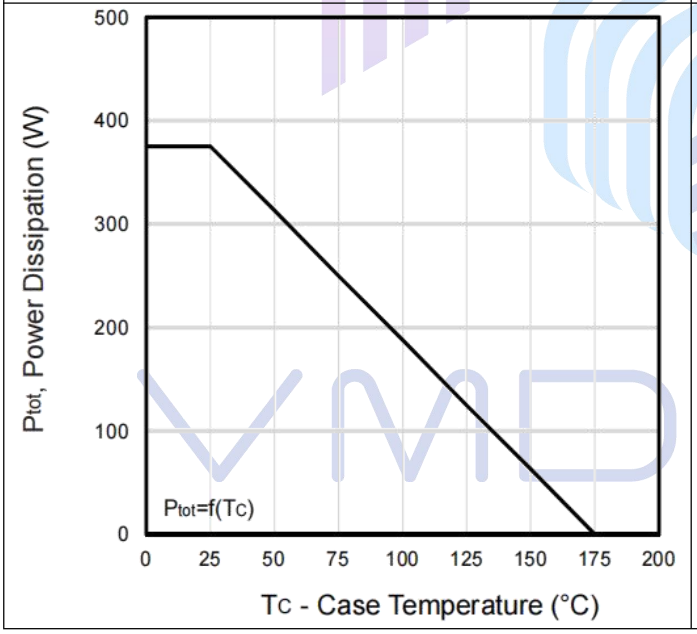


Figure 14: Drain Current Vs. Case Temperature

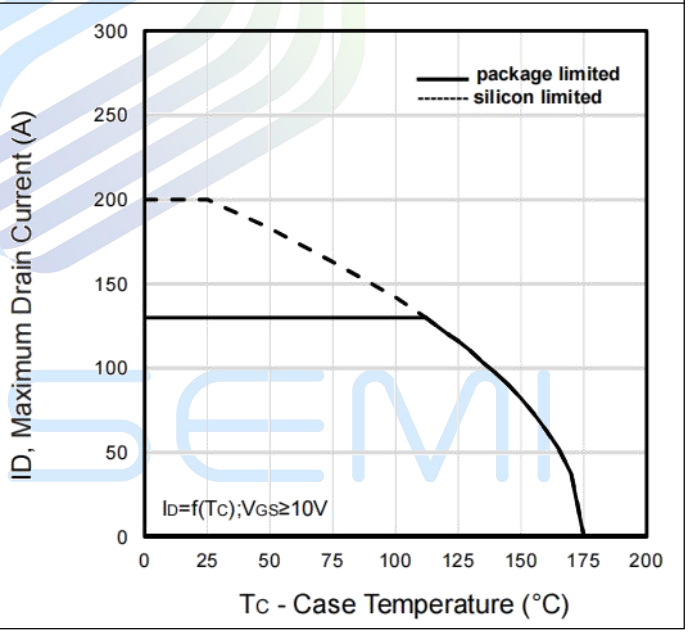
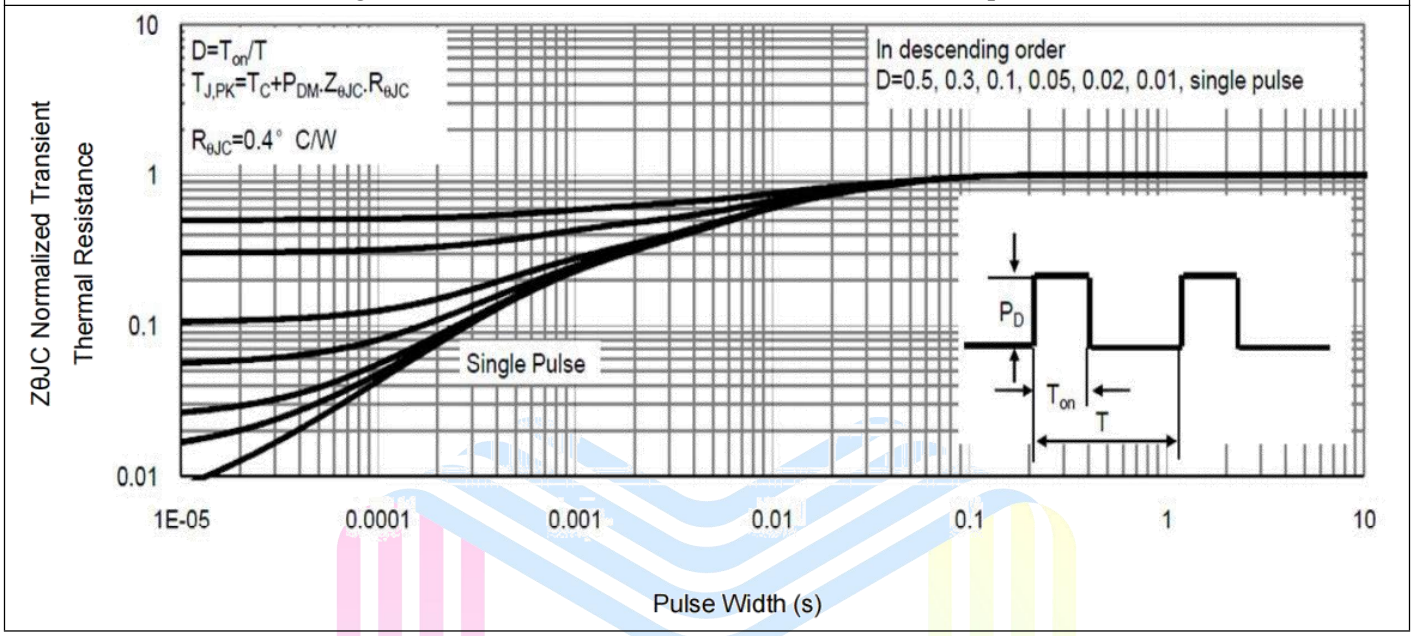
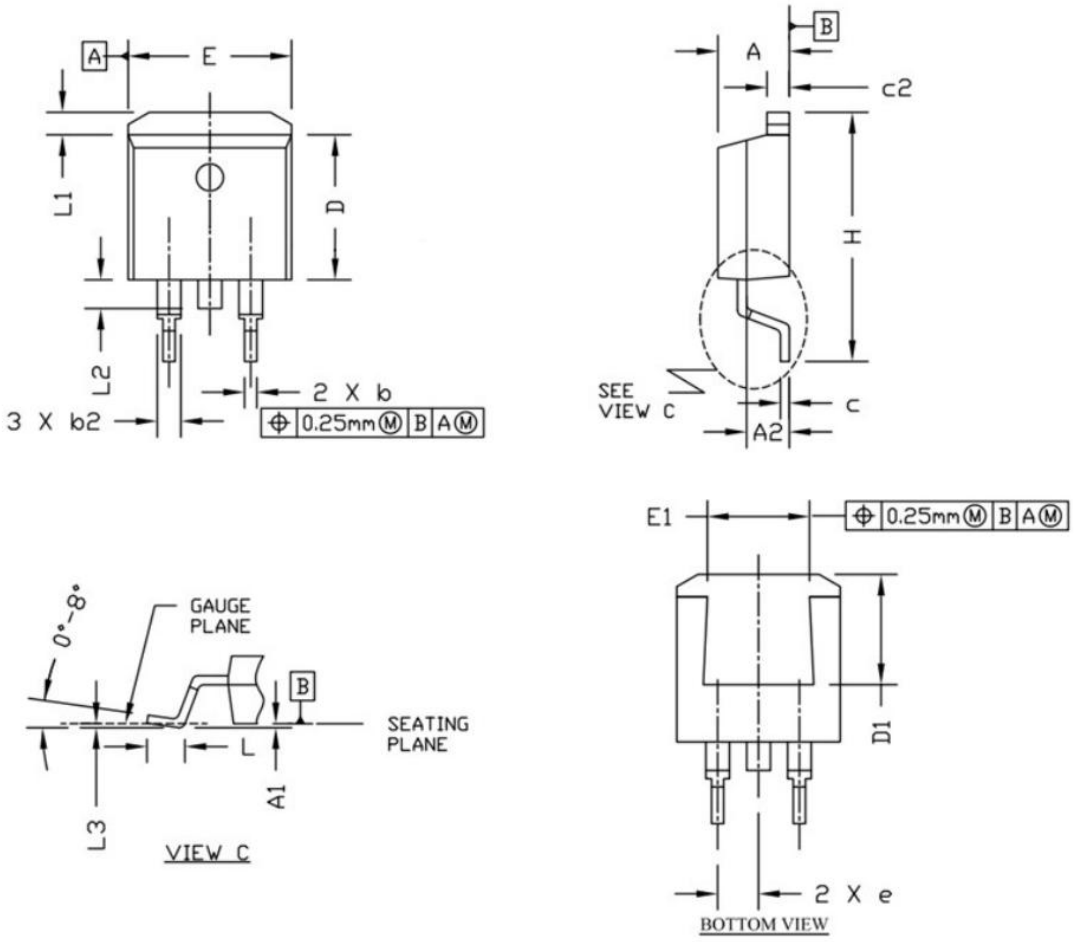


Figure 15: Normalized Maximum Transient Thermal Impedance



Mechanical Dimensions

Package Information TO-263



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	4.400	4.570	4.700
A1	0.000	0.100	0.200
A2	2.300	2.400	2.500
b	0.700	0.800	0.900
b2	1.200	1.270	1.360
c	0.381	0.500	0.737
c2	1.220	1.300	1.350
D	8.600	9.200	9.300
D1	6.860		
e	2.540 BSC		
E	9.780	9.880	10.260
E1	6.225		
H	14.700	15.100	15.500
L	2.000	2.550	2.750
L1	1.000	1.200	1.400
L2	1.300	1.600	1.700
L3	0.255 BSC		

Notes:

1. Refer to JEDEC TO-263 variation AB
2. Dimension "D" & "E" do NOT include mold flash, mold flash shall not exceed 0.127mm per side.

NOTICE

Hangzhou VMD Semiconductor Co., Ltd (VMD) reserves the right to make changes without notice in order to improve reliability, function or design and to discontinue any product or service without notice. Customers should obtain the latest relevant information before orders and should verify that such information is current and complete. All products are sold subject to VMD's terms and conditions supplied at the time of order acknowledgement.

VMD, its affiliates, agents, and employees, and all persons acting on its or their behalf, disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

VMD disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify VMD's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

VMD warrants performance of its hardware products to the specifications at the time of sale, testing, reliability and quality control are used to the extent VMD deems necessary to support this warrantee. Except where agreed upon by contractual agreement, testing of all parameters of each product is not necessarily performed.

VMD does not assume any liability arising from the use of any product or circuit designs described herein. Customers are responsible for their products and applications using VMD's components. To minimize risk, customers must provide adequate design and operating safeguards.

VMD does not warrant or convey any license to any intellectual property rights either expressed or implied under its patent rights, nor the rights of others. Reproduction of information in VMD's data sheets or data books is permissible only if reproduction is without modification or alteration. Reproduction of this information with any alteration is an unfair and deceptive business practice.

VMD is not responsible or liable for such altered documentation. Resale of VMD's products with statements different from or beyond the parameters stated by VMD for that product or service voids all express or implied warrantees for the associated VMD product or service and is an unfair and deceptive business practice.

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