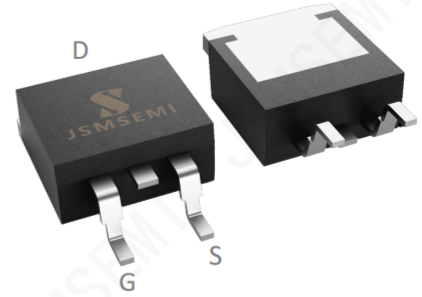


## Product Summary

- $V_{DS}$  100V
- $I_D$  100A
- $R_{DS(ON)}$  (at  $V_{GS}=10V$ )  $<9.0m\Omega$
- 100% EAS Tested
- 100%  $\nabla V_{DS}$  Tested

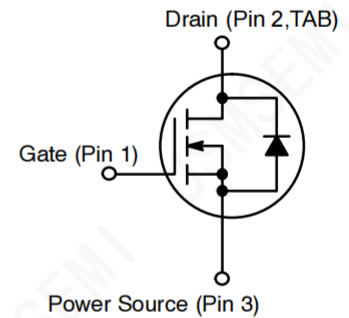


## General Description

- Trench Power MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

## Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor
- Motor drivers



## Absolute Maximum Ratings ( $T_A=25^\circ C$ , unless otherwise specified)

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	100	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Continuous Drain Current	$I_D$	$T_C=25^\circ C$ <sup>Note1</sup>	100	A
		$T_C=100^\circ C$	70	A
		$T_A=25^\circ C$ <sup>Note4</sup>	17	A
Pulsed Drain Current <sup>Note2</sup>	$I_{D,pulse}$	600	A	
Avalanche energy, single pulse <sup>Note3</sup>	EAS	110	mJ	
Power Dissipation	$P_D$	$T_C=25^\circ C$	256	W
		$T_A=25^\circ C$ <sup>Note4</sup>	3.1	W
Operating and Storage Temperature Range	$T_J, T_{SGT}$	-55 to 150	$^\circ C$	

## Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	-	-	0.8	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient <sup>Note4</sup>	$R_{\theta JA}$	-	-	40	$^\circ C/W$

## Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
IRFS4410ZTRLPBF-JSM	TO-263	FS4410	-55 to 150 $^\circ C$	1	T&R, 800	Rohs

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Statistic Characteristics</b>						
Drain-Source Breakdown Voltage	$B_{VDSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
ZeroGate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V$	-	-	1	$\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.2	3.0	3.8	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=50A$	-	7.0	9.0	m $\Omega$
Gate Resistance	$R_g$	$f=1\text{MHz}$	-	1.5	-	$\Omega$
Forward Transconductance <sup>Note5</sup>	$g_{fs}$	$V_{DS}=5V, I_D=50A$	-	90	-	S
<b>Dynamic Characteristics<sup>Note5</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=50V, f=1\text{MHz}$	-	4646	-	pF
Output Capacitance	$C_{oss}$		-	580	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	30	-	pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=50V, I_D=50A$ $V_{GS}=10V, R_G=6\Omega$	-	53	-	ns
Rise Time	$t_r$		-	88	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	85	-	ns
Fall Time	$t_f$		-	22	-	ns
<b>Gate Charge Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS}=50V, V_{GS}=10V$ $I_D=50A$	-	69	-	nC
Gate to Source Charge	$Q_{gs}$		-	22	-	nC
Gate to Drain Charge	$Q_{gd}$		-	17	-	nC
<b>Reverse Diode Characteristics<sup>Note5</sup></b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_F=50A$	-	0.92	1.2	V
Reverse recovery time	$t_{rr}$	$I_F=50A, V_{DS}=50V$ $di/dt=100A/\mu s$	-	72	-	ns
Reverse recovery charge	$Q_{rr}$		-	138	-	nC

Notes:

1. Package limited
2. Pulse width limited by maximum junction temperature
3.  $V_{DS}=50V, V_{GS}=10V, L=0.1\text{mH}$
4.  $R_{\theta JA}$  is determined with the device mounted on a 1 in<sup>2</sup> pad 2 oz copper pad on a 1.5x1.5 in. board of FR-4 material
5. Guaranteed by design, not subject to production testing

**Electrical Characteristics Diagrams**

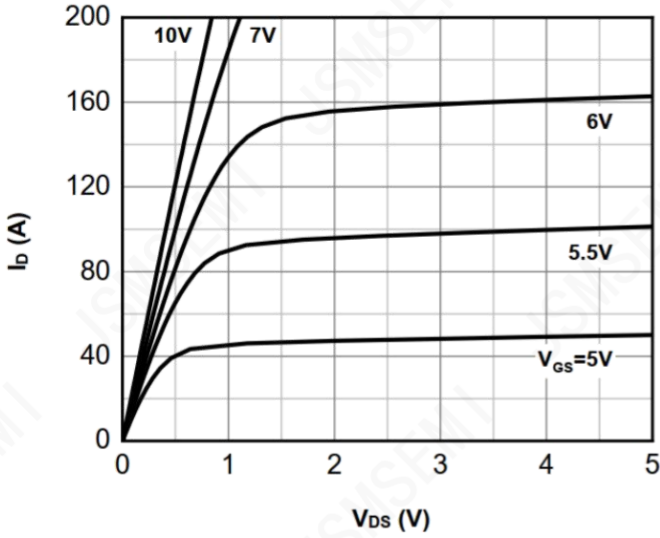


Figure 1: Typ. Output Characteristics

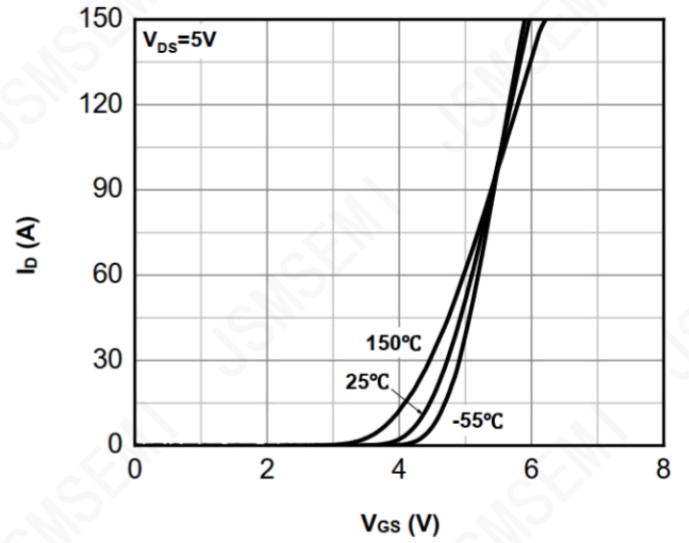


Figure 2: Typ. Transfer Characteristics

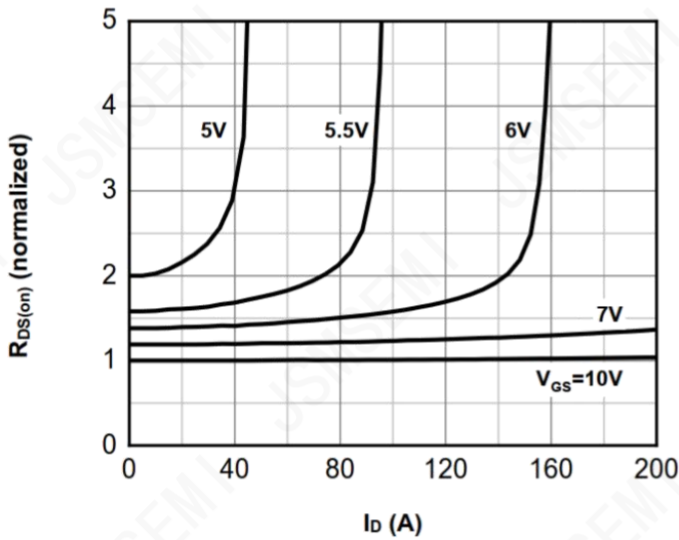


Figure 3: Normalized On-Resistance vs. Drain Current

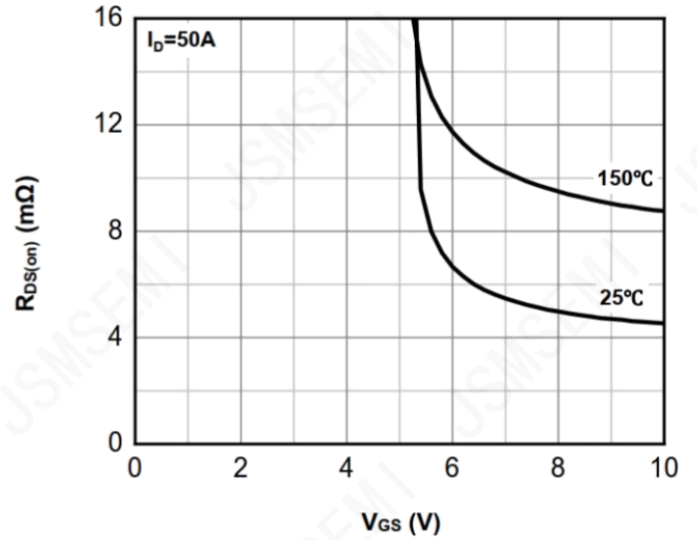


Figure 4: Typ. On-Resistance vs. Gate-source Voltage

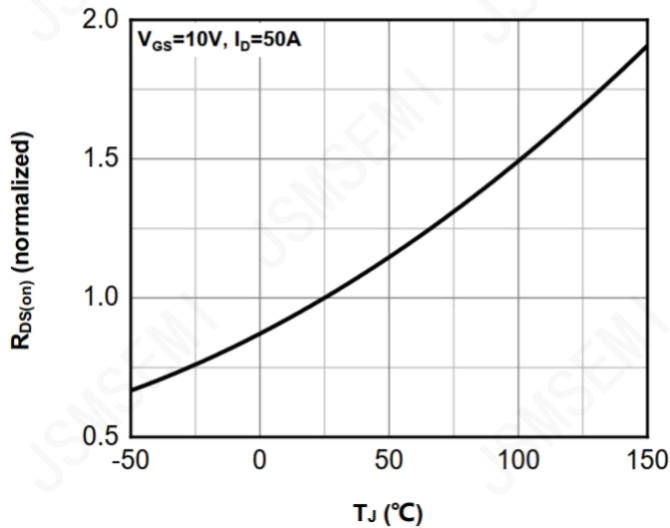


Figure 5: Normalized On-Resistance vs. Junction Temperature

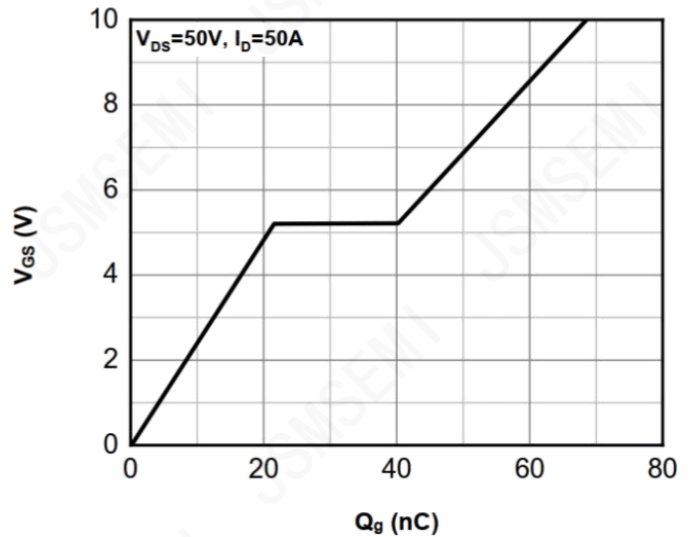


Figure 6: Typ. Gate Charge

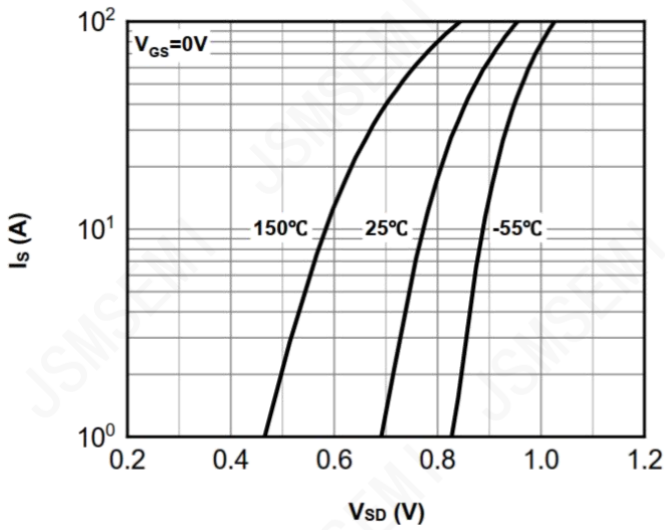


Figure 7: Typ. Forward Characteristics of Body Diode

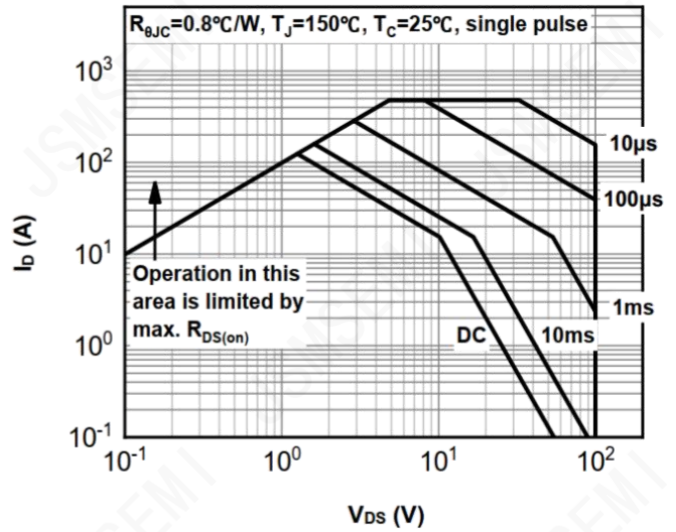


Figure 8: Safe Operating Area

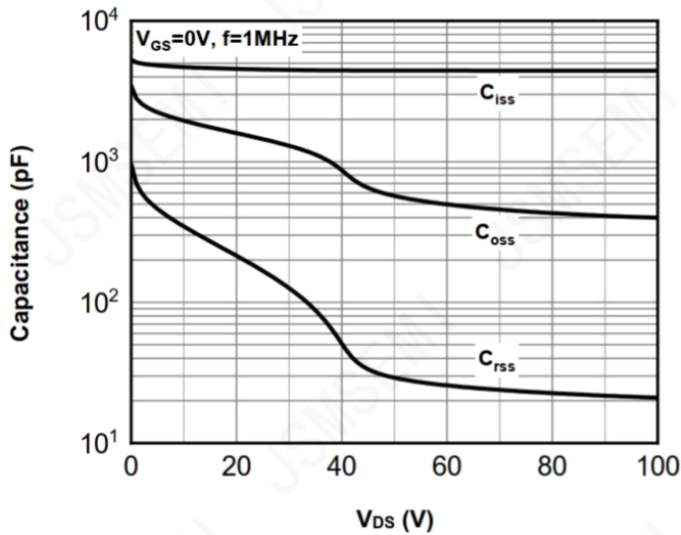


Figure 9: Typ. Capacitances

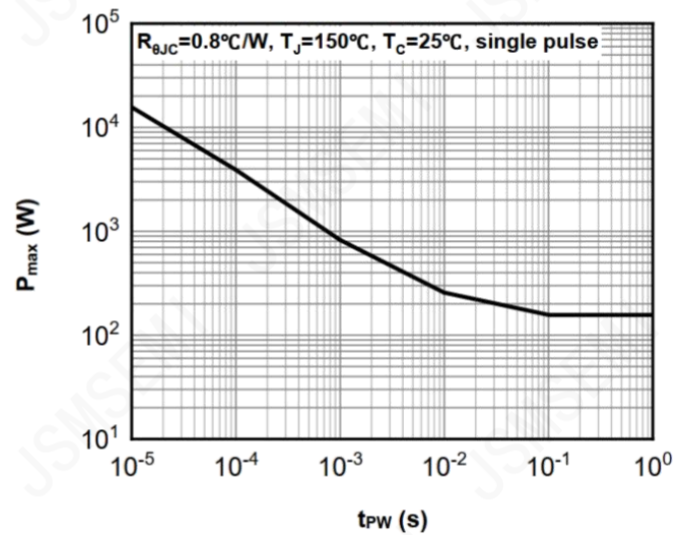


Figure 10: Single Pulse Maximum Power Dissipation

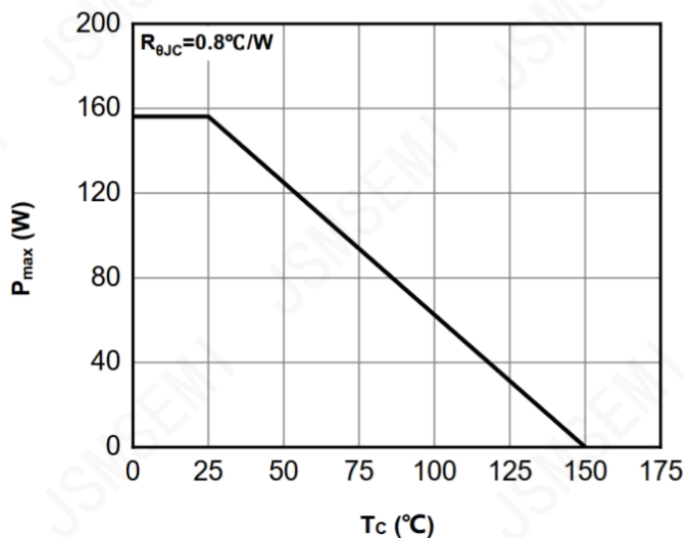


Figure 11: Max. Power Dissipation vs. Case Temperature

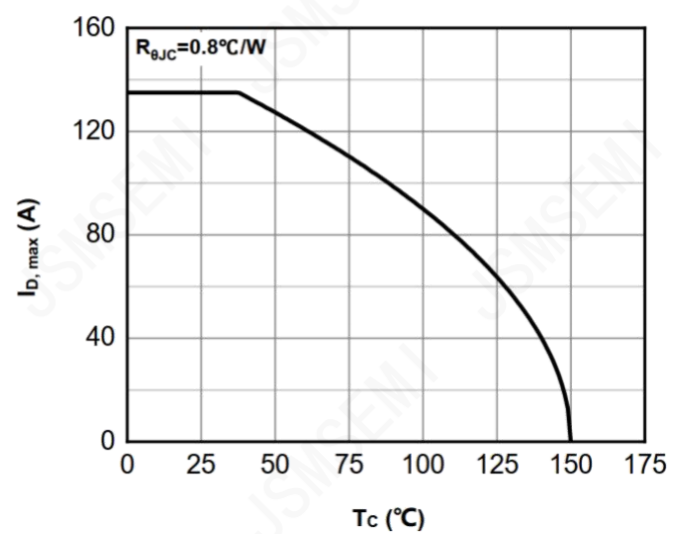


Figure 12: Max. Continuous Drain Current vs. Case Temperature

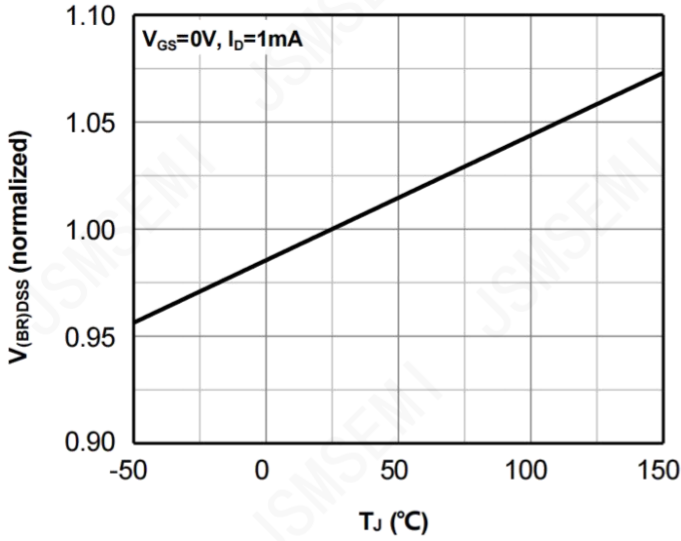


Figure 13: Normalized  $V_{(BR)DSS}$  vs. Junction Temperature

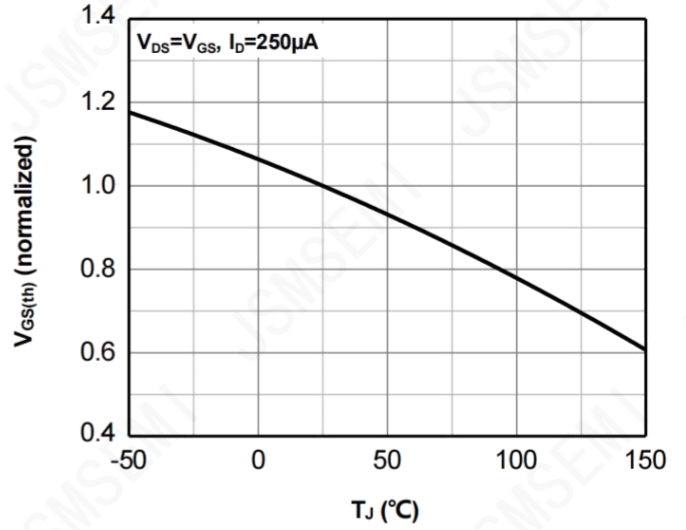


Figure 14: Normalized  $V_{GS(th)}$  vs. Junction Temperature

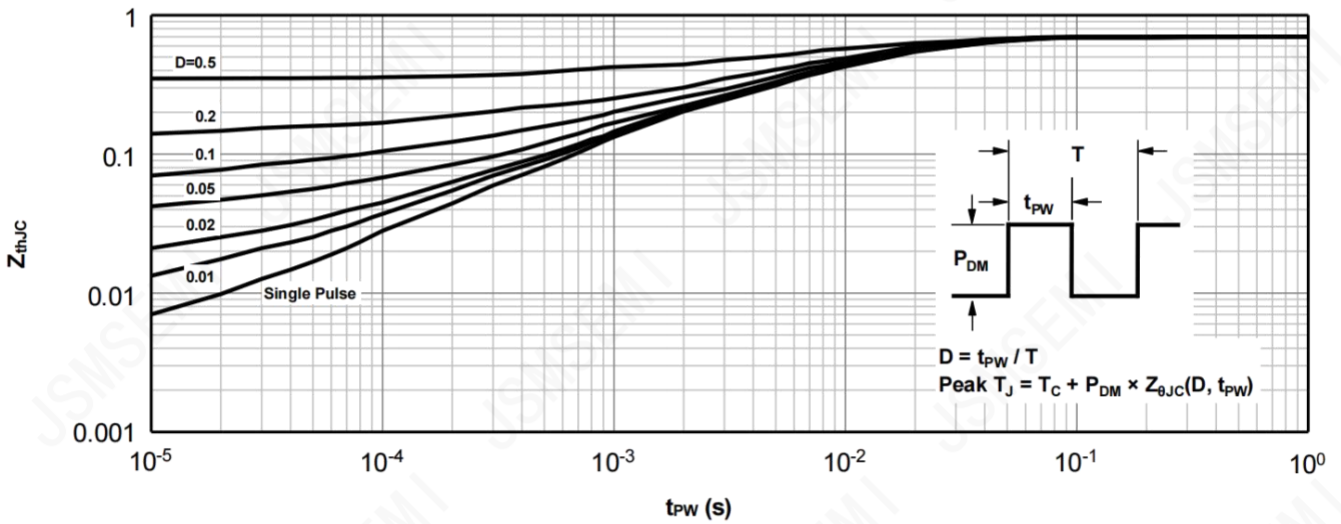
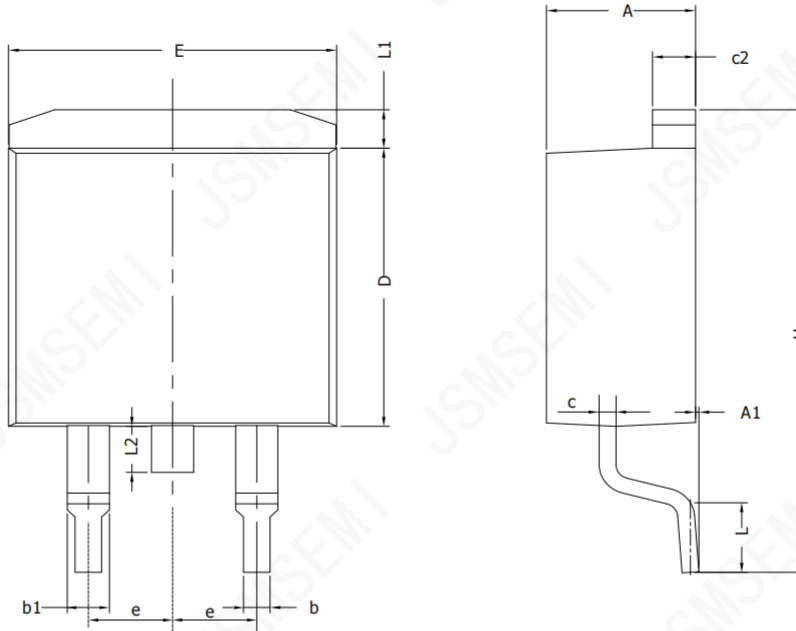


Figure 15: Normalized Transient Thermal Impedance Form Junction To Case

Package Information

TO-263-2



SYMBOL	MIN	NOM	MAX
A	4.30	4.57	4.72
A1	0	0.10	0.25
b	0.71	0.81	0.91
c	0.30	---	0.60
c2	1.17	1.27	1.37
D	8.50	---	9.35
E	9.80	---	10.45
e	2.54BSC		
H	14.70	---	15.75
L	2.00	2.30	2.74
L1	1.12	1.27	1.42
L2	---	---	1.75

## Revision History

Rev.	Change	Date
V1.0	Initial version	6/27/2021

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