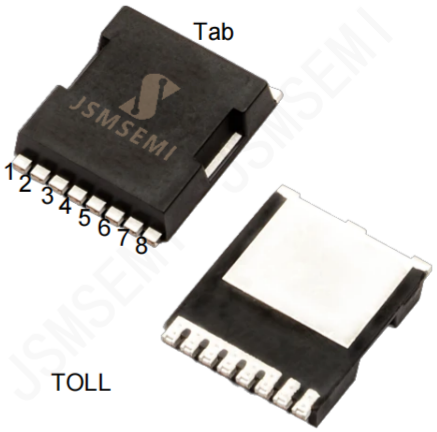
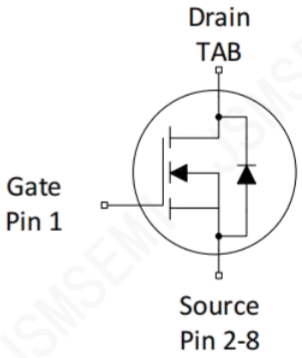
Product Summary

- V_{DS} 100V
- I_D 370A
- $R_{DS(ON)}$(at V_{GS}=10V) <1.5mΩ
- $R_{DS(ON)}$(at V_{GS}=4.5V) <----mΩ
- 100% EAS Tested
- 100% ▽V_{DS} Tested



General Description

- Split gate trench 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 drives

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

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25℃	I_D	370	A
Pulsed Drain Current Note 2	T_C=25℃	I_{DM}	1480	A
Max Power Dissipation	T_C=25℃	P_D	431	W
Avalanche Energy, Single Pulse Note 3		E_{AS}	2540	mJ
Operating and Storage Temperature Range		T_J,T_{SGT}	-55 to 150	℃

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	-	0.29	-	°C/W
Thermal Resistance, Junction-to-Ambitent Note 4	$R_{\theta JA}$	-	40	-	°C/W

Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship,Quantity	Green
SHYG016N10NS1TA	TOLL-8	JSM015N10LG	-55 to 150°C	1	T&R,2000	Rohs

Electrical Characteristics(T_A= 25 ℃, 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
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D= 250uA	2.2	3.0	3.8	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=100A	-	1.2	1.5	mΩ
Gate Resistance	R_g	f=1MHz	-	1	-	Ω
Forward Transconductance	g_{fs}	V_{DS}= 5V, I_D= 100A	-	260	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V	-	15800	-	pF
Output Capacitance	C_{oss}	V_{DS}=50V	-	1930	-	pF
Reverse Transfer Capacitance	C_{rss}	f=1MHz	-	75	-	pF
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=50V	-	81	-	ns
Rise Time	t_r	I_D=100A	-	178	-	ns
Turn-off Delay Time	$t_{d(off)}$	V_{GS}=10V	-	167	-	ns
Fall Time	t_f	R_G=6Ω	-	68	-	ns
Gate Charge Characteristics						
Total Gate Charge	Q_g	V_{DS}=50V	-	260	-	nC
Gate to Source Charge	Q_{gs}	V_{GS}=10V	-	75	-	nC
Gate to Drain Charge	Q_{gd}	I_D=100A	-	76	-	nC
Reverse Diode Characteristics Note 5						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F= 100A	-	0.85	1.1	V
Reverse recovery time	t_{rr}	I_F=50A, V_{DS}=50V	-	92	-	ns
Reverse recovery charge	Q_{rr}	di/dt=100A/μs	-	200	-	nC

Notes:

1. Package limited
2. Pulse width limited by maximum junction temperature
3. V_{DS} =75V, V_{GS} =10 V, L = 0.3 mH
4. $R_{\theta JA}$ is determined with the device mounted on a 1 in2 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

Typical Performance Characteristics

Figure 1: Typ Output Characteristics

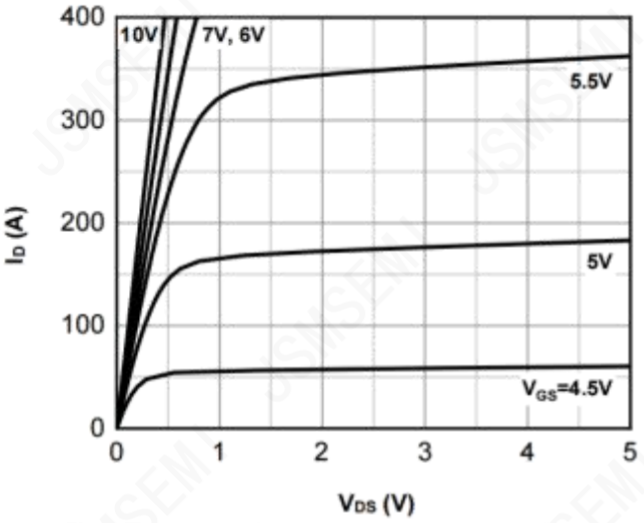


Figure 2: Typ Transfer Characteristics

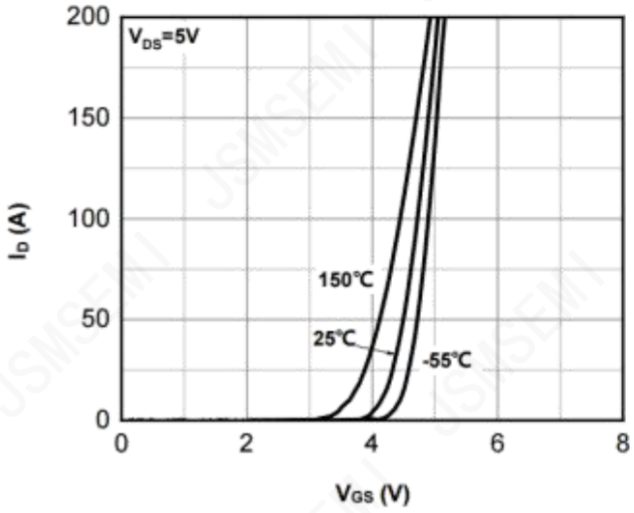


Figure 3: Normalized On-Resistance vs Drain Current

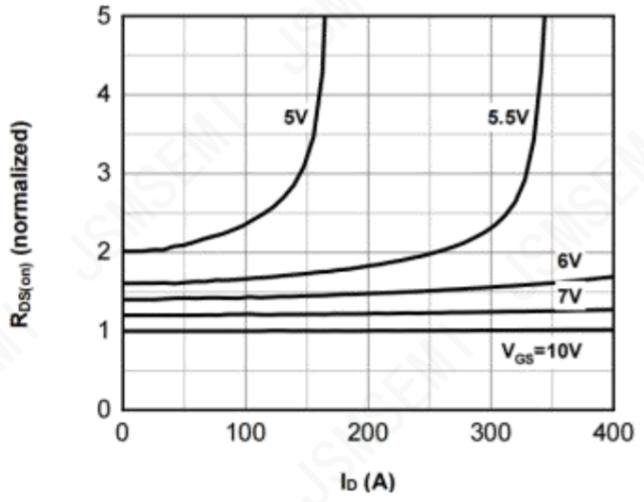


Figure 4: Typ On-Resistance vs Gate-source Voltage

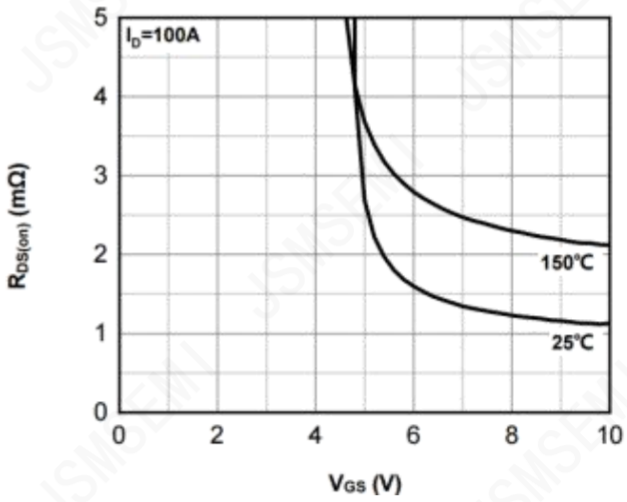


Figure5:Normalized On-Resistance vs. Junction Temperature

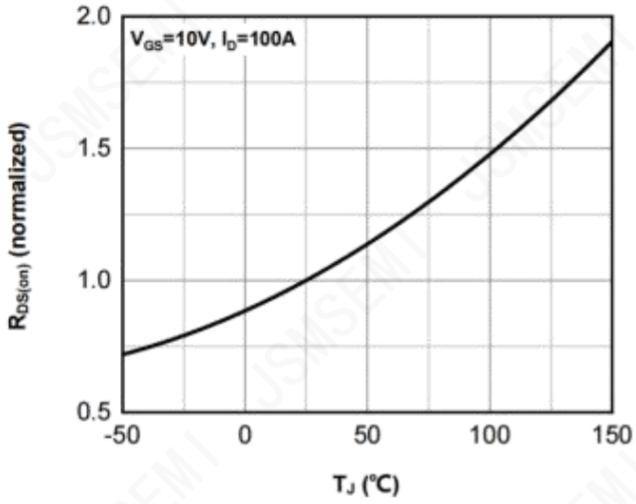


Figure 6: Typ.Gate Charge

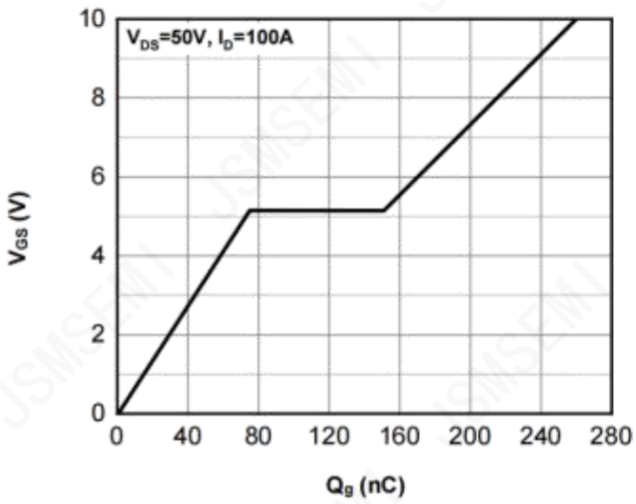


Figure 7:Typ. Forward Characteristics of Body Diode

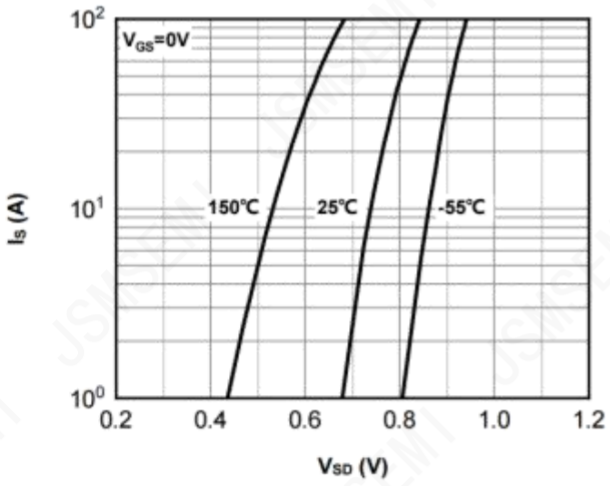


Figure 8: Safe Operating Area

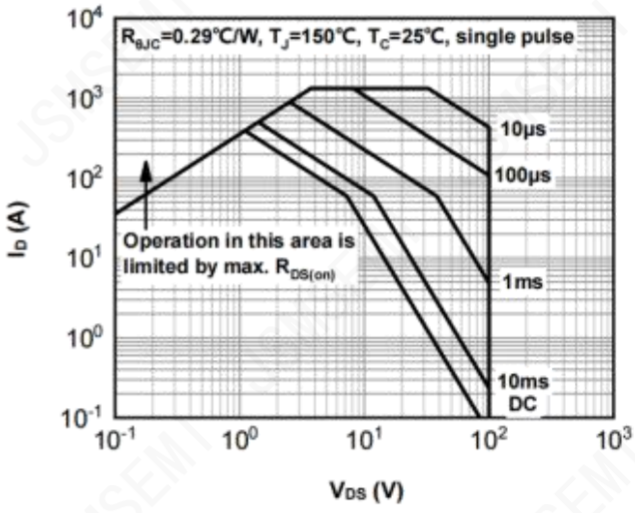


Figure 9: Typ Capacitances

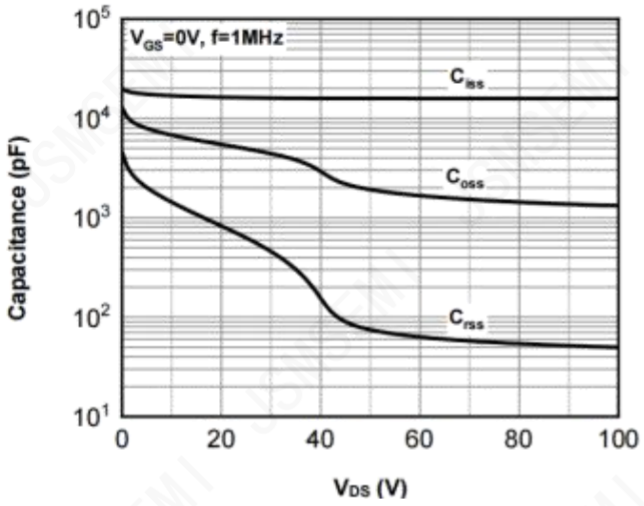


Figure 10: Single Pulse Maximum Power Dissipation

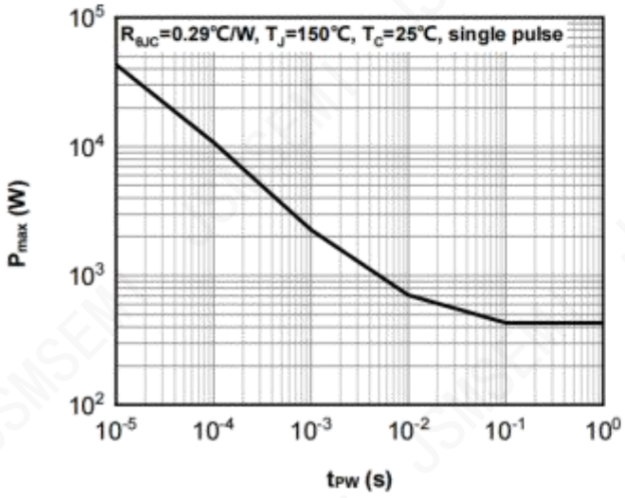


Figure 11: Max. Power Dissipation vs. Case Tempertur

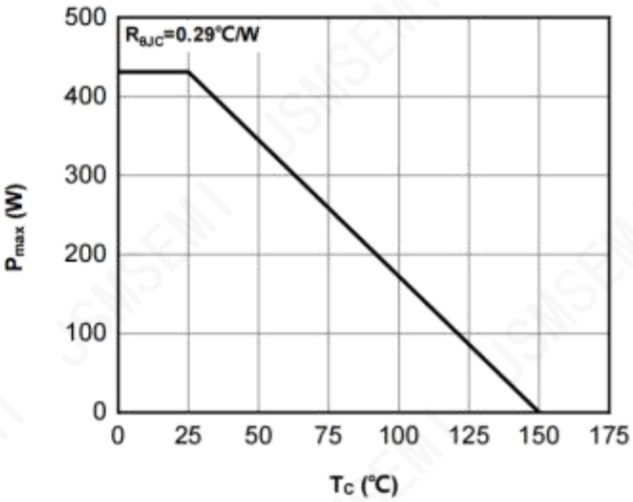
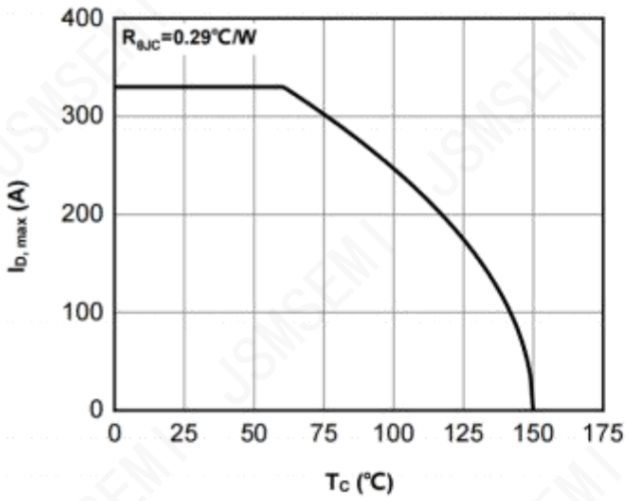


Figure 12: Max.Continuous Drain Current vs. Case Temperature



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

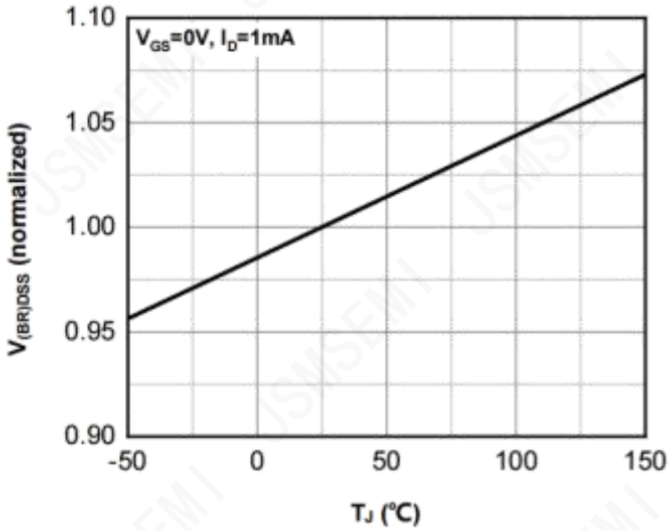


Figure 14: Normalized $V_{GS(th)}$ vs. Junction Temperature

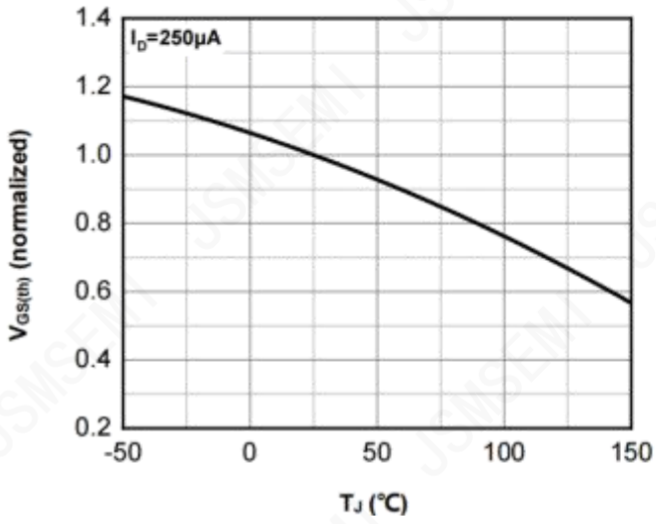
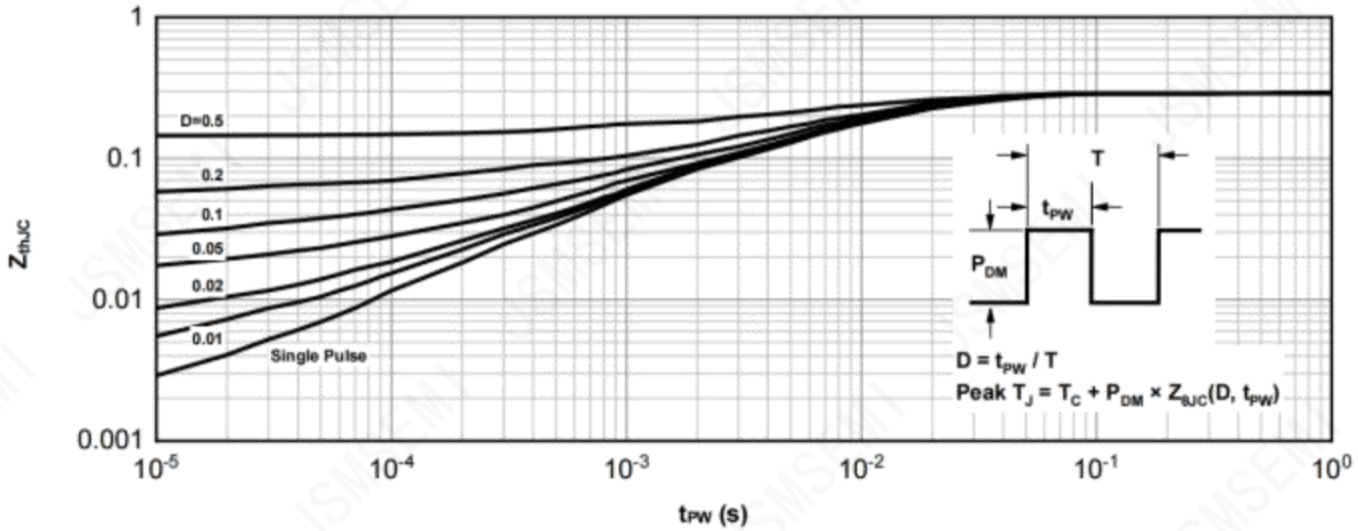
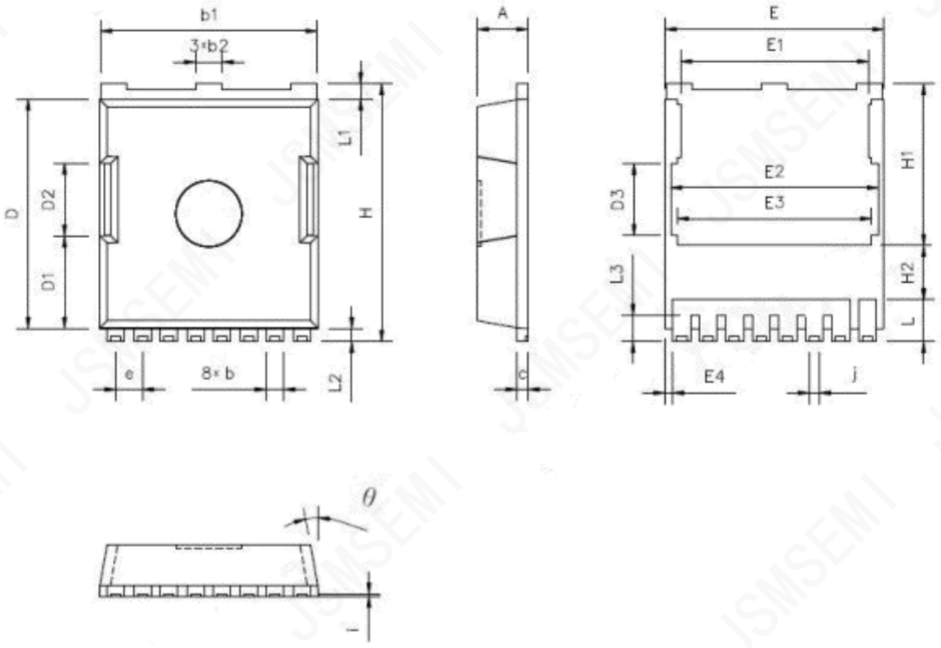


Figure 15: Normalized Transient Thermal Impedance Form Junction To Case



Mechanical Dimensions

TOLL Package Information



Dim	Millimeters		
	Min	Nom	Max
A	2.20	—	2.40
b	0.70	—	0.90
b1	9.70	—	9.90
b2		1.20 REF	
c	0.40	—	0.60
D	10.28	—	10.48
D1	4.08	—	4.28
D2	3.20	—	3.40
D3	3.16	—	3.36
E	9.80	—	10.00
E1	8.40	—	8.60
E2	9.30	—	9.50
E3		8.80 REF	
E4	0.25	—	0.45
e		1.20 BASIC	
H	11.58	—	11.78
H1	7.23	—	7.43
H2		2.45 REF	
i	0.10	—	—
j		0.45 REF	
L	1.60	—	2.10
L1	0.60	—	0.80
L2	0.50	—	0.70
L3	1.05	—	1.30
θ		10° REF	

Revision History

Rev.	Change	Date
V1.0	Initial version	5/23/2021

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