

Product Summary

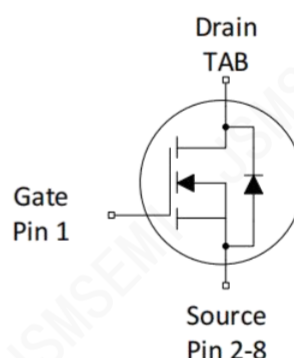
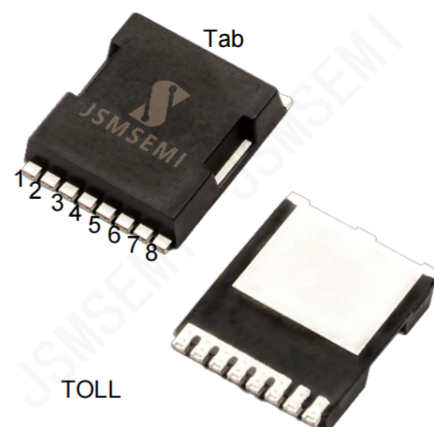
- V_{DS} 100V
- I_D 380A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $< 1.5m\Omega$
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) $< ---m\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested

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 ($T_A = 25^\circ C$, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ C$	I_D	380	A
Pulsed Drain Current ^{Note 2}	$T_C = 25^\circ C$	I_{DM}	1520	A
Max Power Dissipation	$T_C = 25^\circ C$	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	$^\circ C$

Thermal Resistance

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

Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
SHYG015N10NS1TA	TOLL-8	JSM015N10LG	-55 to $150^\circ C$	1	T&R, 2000	Rohs

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=100A$	-	1.2	1.5	m Ω
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	$R_G=6\Omega$	-	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}	$di/dt=100A/\mu s$	-	200	-	nC

Notes:

- Package limited
- Pulse width limited by maximum junction temperature
- $V_{DS}=75V, V_{GS}=10V, L=0.3mH$
- $R_{\theta JA}$ 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
- Guaranteed by design, not subject to production testing

Typical Performance Characteristics

Figure 1: Typ Output Characteristics

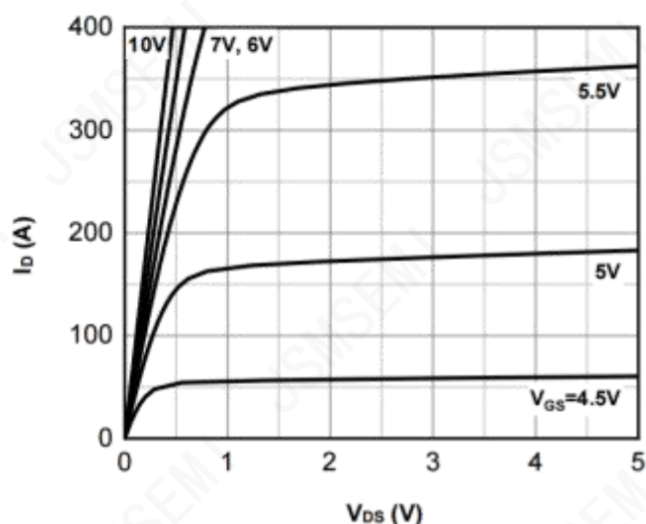


Figure 2: Typ Transfer Characteristics

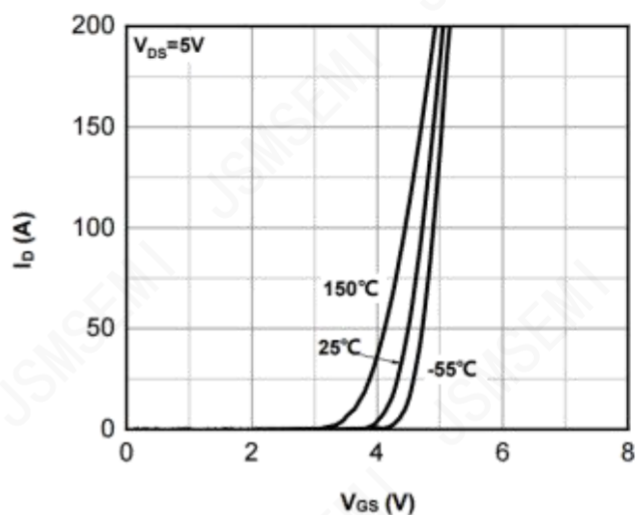


Figure 3: Normalized On-Resistance vs Drain Current

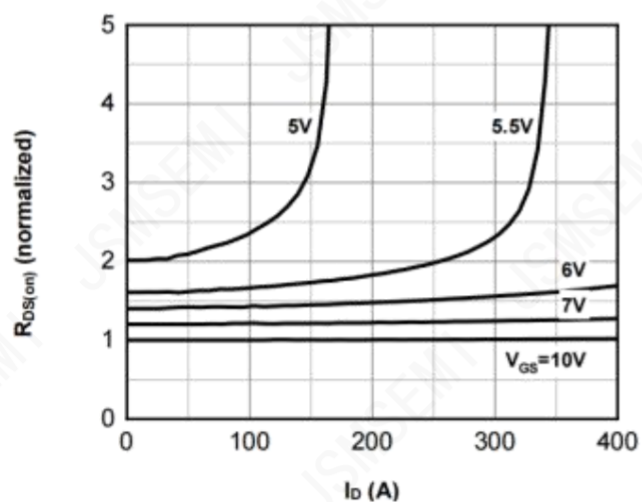


Figure 4: Typ On-Resistance vs Gate-source Voltage

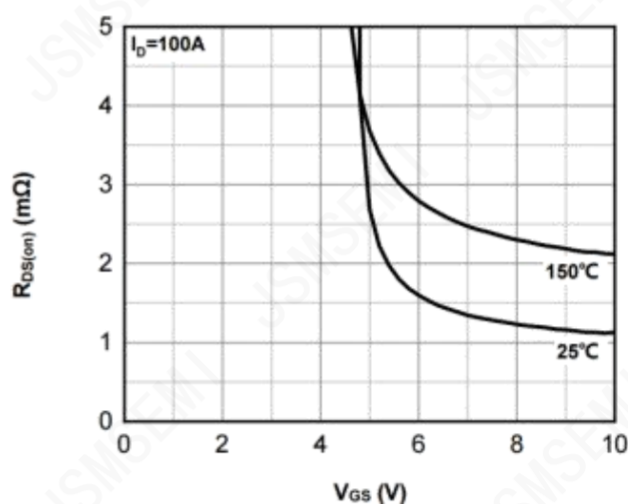


Figure5: Normalized On-Resistance vs. Junction Temperature

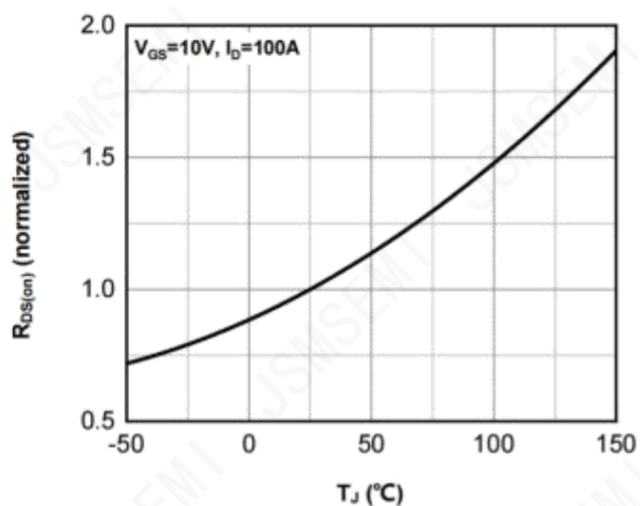


Figure 6: Typ. Gate Charge

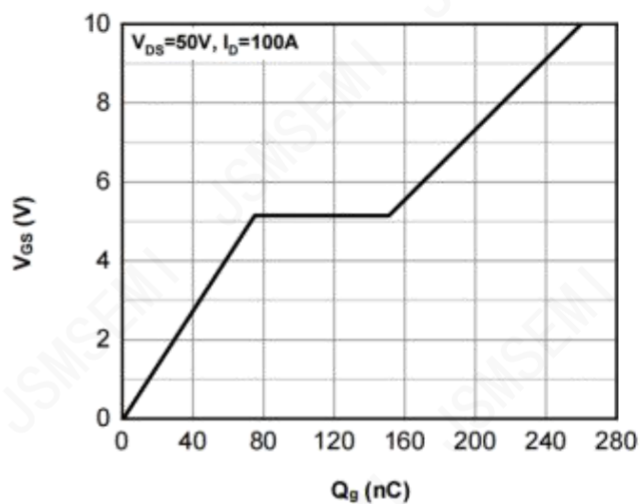


Figure 7: Typ. Forward Characteristics of Body Diode

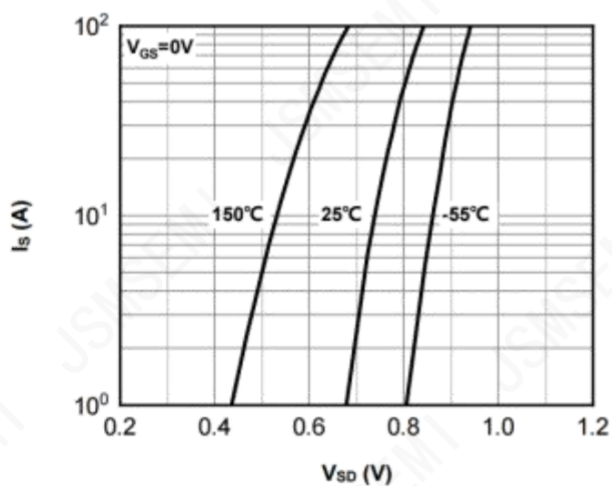


Figure 8: Safe Operating Area

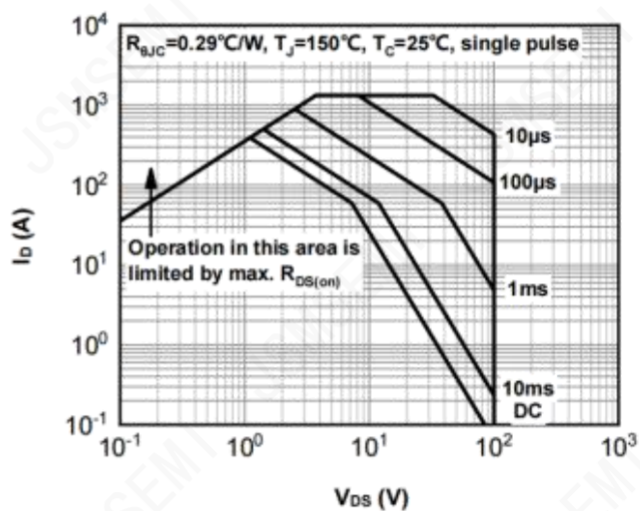


Figure 9: Typ Capacitances

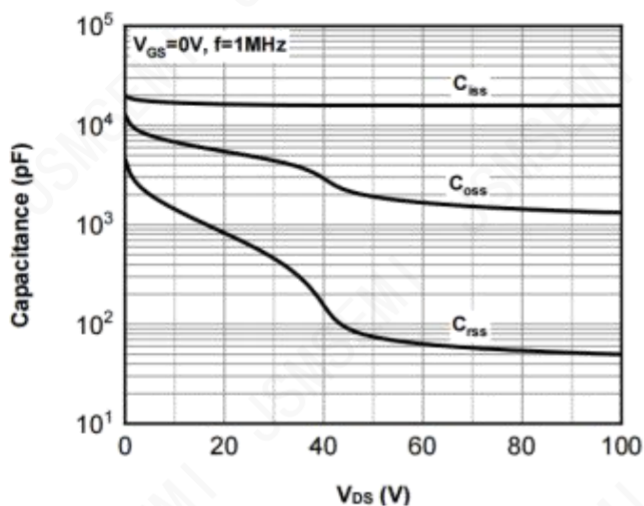


Figure 10: Single Pulse Maximum Power Dissipation

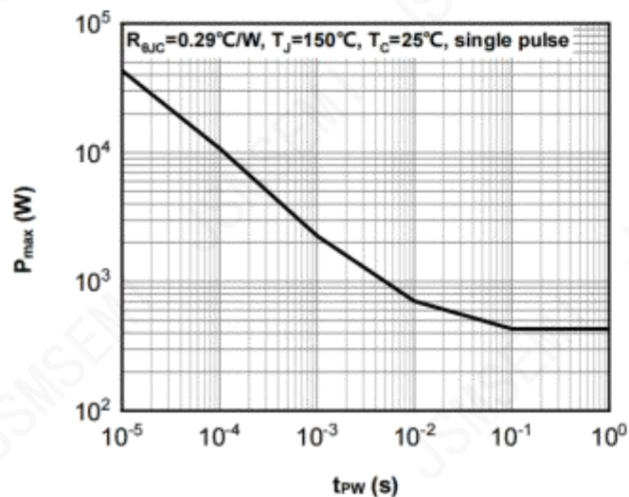


Figure 11: Max. Power Dissipation vs. Case Temperature

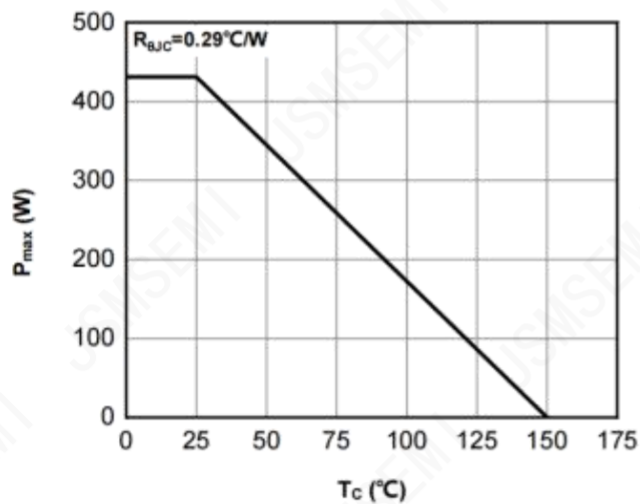


Figure 12: Max. Continuous Drain Current vs. Case Temperature

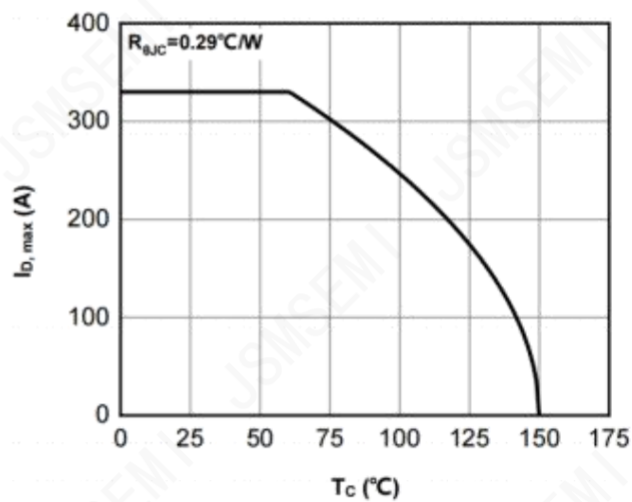


Figure 13: Normalized $V_{(BR)DSS}$ vs. Junction Temperature

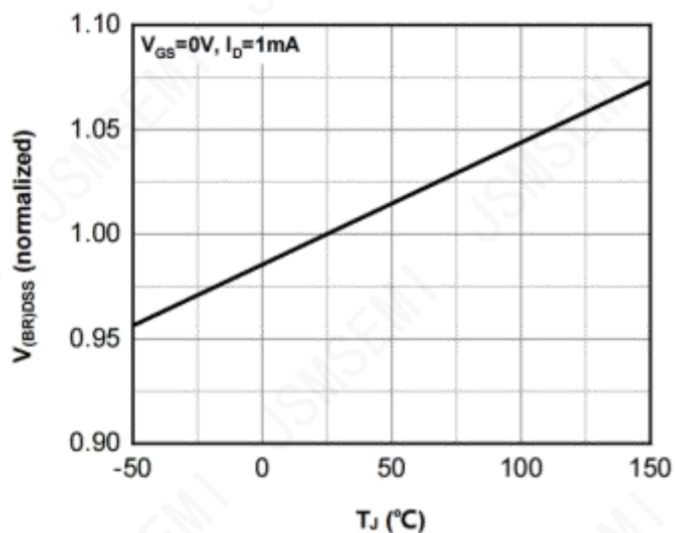


Figure 14: Normalized $V_{GS(th)}$ vs. Junction Temperature

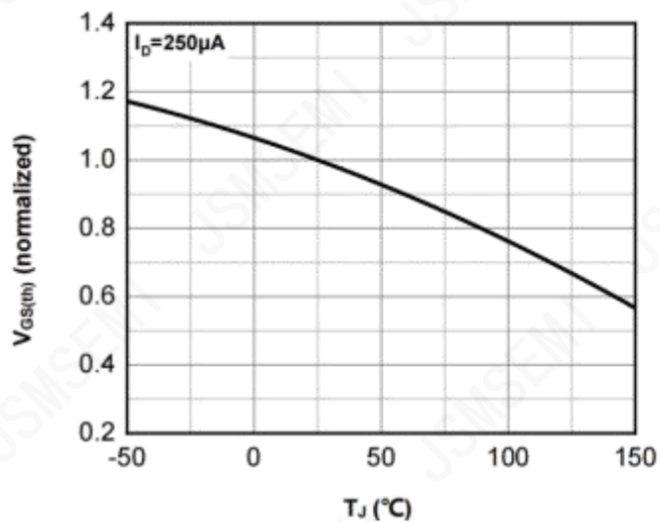
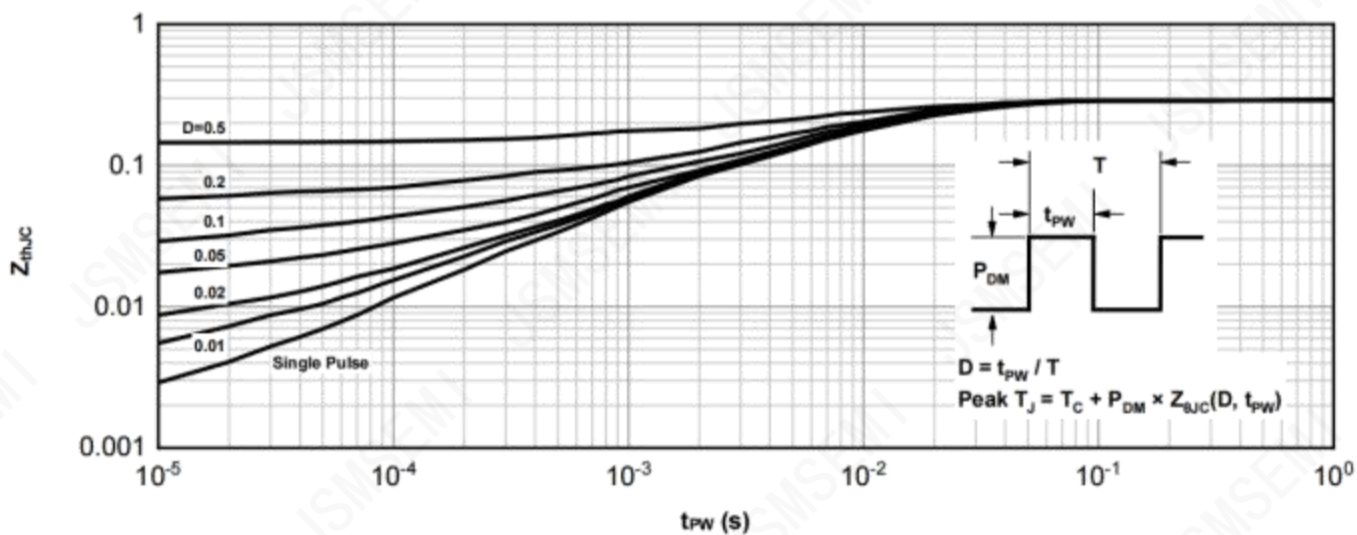
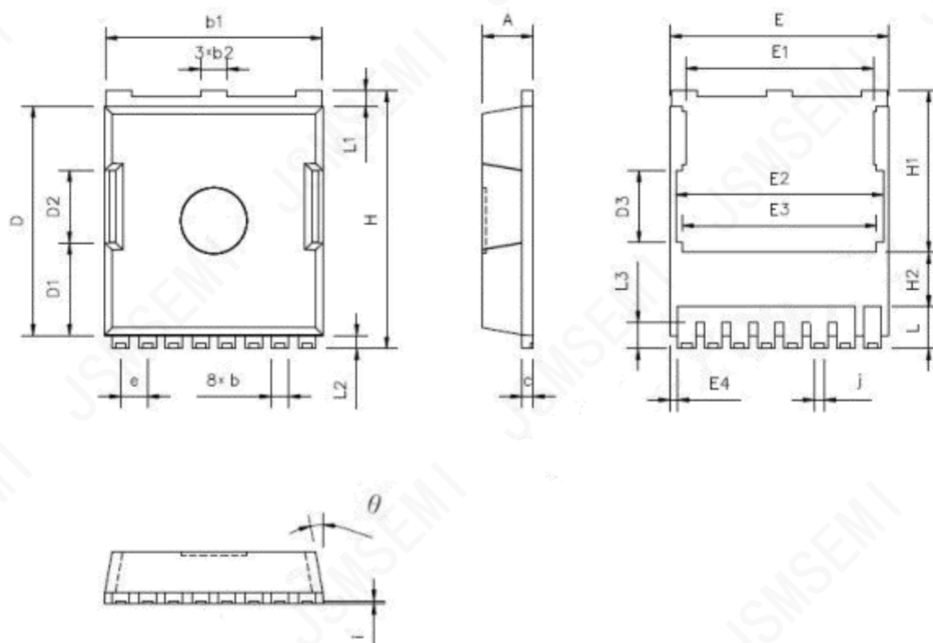


Figure 15: Normalized Transient Thermal Impedance From Junction To Case



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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