GOSTONE

RoHS COMPLIANT

N-Channel 100V, 2.0mΩ max., TOLL MOSFET

GMS020N10M

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
100	2.0 @ V_{GS} = 10V	259 (1)

General Information

Shipping

- One shipping options is offered as standard
- Un-sawn wafer

Handling

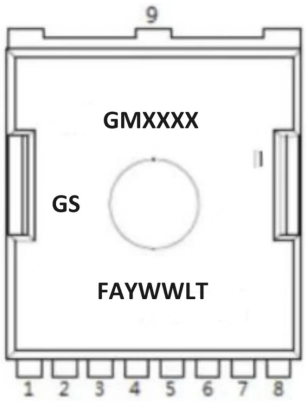
- Product must be handled only at ESD safe workstations. Standard ESD precautions and safe work environments are as defined in MIL-HDBK-263.
- Product must be handled only in a class 10,000 or better-designated clean room environmen

Features

- Low $R_{DS(on)}$ SGT technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Application

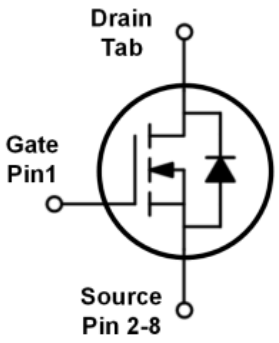
- DC/DC conversion
- Power switch
- Motor drives



TOLL

NOTE:
LOGO - GS
GMXXXXX- Part number code
F - Fab location code
A - Assembly location code
Y - Year code
WW - Week code
L&T - Assembly lot code

Equivalent circuit



Absolute Maximum Rating (Ta=25°C)

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25℃ (1)	I_D	259	A
	T_C=100℃		164	
	T_A=25℃ (4)		28	
Pulsed drain current(2)		$I_{D,pulse}$	1036	
Avalanche energy, single pulse(3)		E_{AS}	1365	mJ
Power dissipation	T_C=25℃	P_D	250	W
	T_A=25℃ (4)		3.1	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	℃

Electrical characteristics (Ta=25°C ± 3°C)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter						
Drain to source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 1 mA	100			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	2.2	3.0	3.8	V
Gate-body leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = 100 V, V_{GS} = 0 V			1	μA
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 100 A		1.9	2	mΩ
Forward transconductance(5)	g_{fs}	V_{DS} = 5 V, I_D = 100 A		238		S
Gate resistance	R_g	f = 1 MHz		2.0		Ω
Dynamic(5)						
Total gate charge	Q_g	V_{DS} = 50 V, I_D = 100 A, V_{GS} = 10 V		176		nC
Gate-source charge	Q_{gs}			47		
Gate-drain charge	Q_{gd}			54		
Turn-on delay time	$t_{d(on)}$	V_{DS} = 50 V, I_D = 100 A, V_{GS} = 10 V, R_{GEN} = 6 Ω		85		ns
Rise time	t_r			137		
Turn-off delay time	$t_{d(off)}$			92		
Fall time	t_f			98		
Input capacitance	C_{iss}	V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz		10120		pF
Output capacitance	C_{oss}			1360		
Reverse transfer capacitance	C_{rss}			50		
Reverse Diode Characteristics(5)						
Diode forward voltage	V_{SD}	V_{GS} = 0 V, I_F = 100 A		0.9	1.2	V
Reverse recovery time	t_{rr}	V_{DS} = 50 V, I_F = 50 A, di/dt = 100 A/μs		79		ns
Reverse recovery charge	Q_{rr}			180		nC

Notes

(1) Limited by maximum junction temperature..

(2) Pulse width limited by maximum junction temperature.

(3) V_{DS} = 50 V, V_{GS} = 10 V, L = 0.5 mH.

(4) $R_{\theta JA}$ is determined with the device mounted on a 1 in^2 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.

Thermal Characteristic (Ta=25°C)

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	0.5	°C/W
Thermal resistance, junction-to-ambient (4)	Steady state	$R_{\theta JA}$	40	

Electrical characteristics diagrams

Fig.1 Typ. transfer characteristics

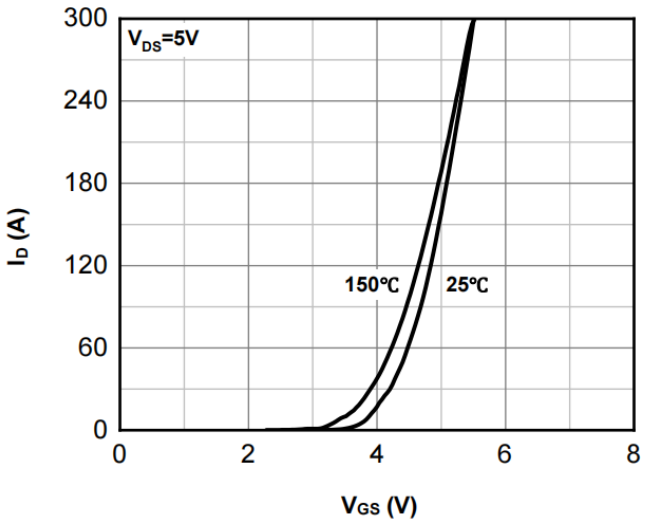


Fig.2 Typ. output characteristics

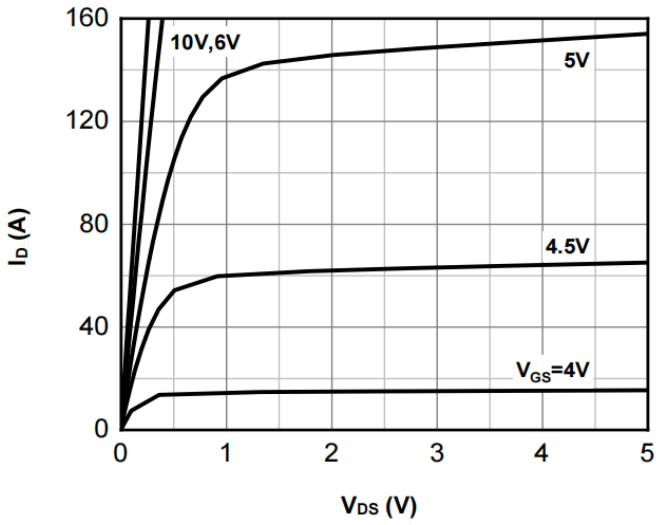


Fig.3 Normalized on-resistance vs drain current

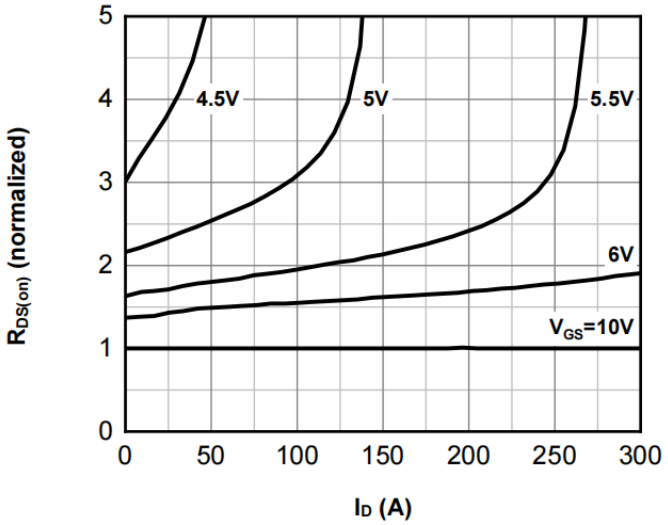


Fig.4 Typ. on-resistance vs gate-source voltage

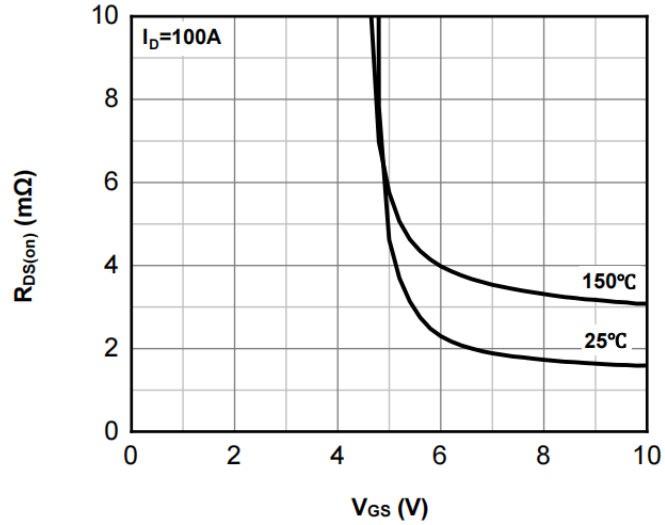


Fig.5 Normalized on-resistance vs junction temperature

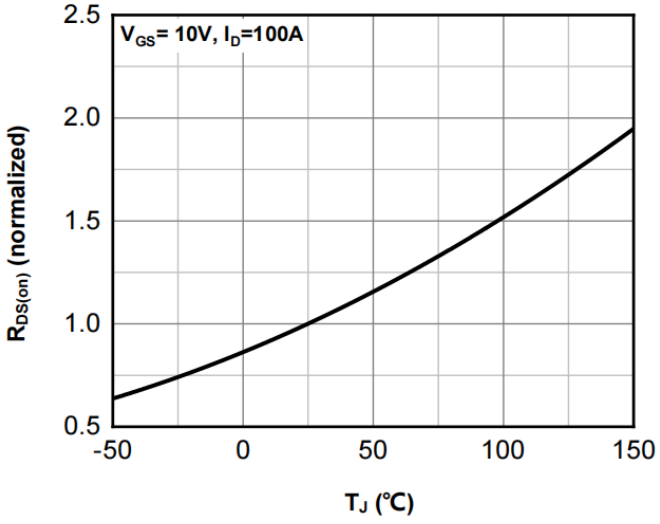


Fig.6 Typ. gate charge

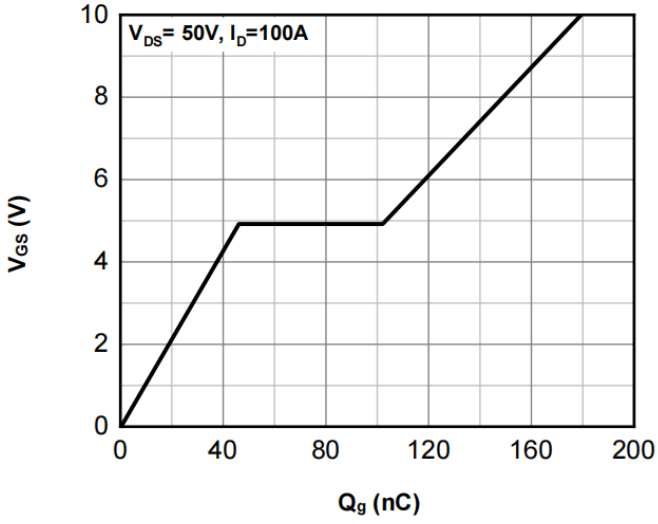


Fig.7 Typ. forward characteristics of body diode

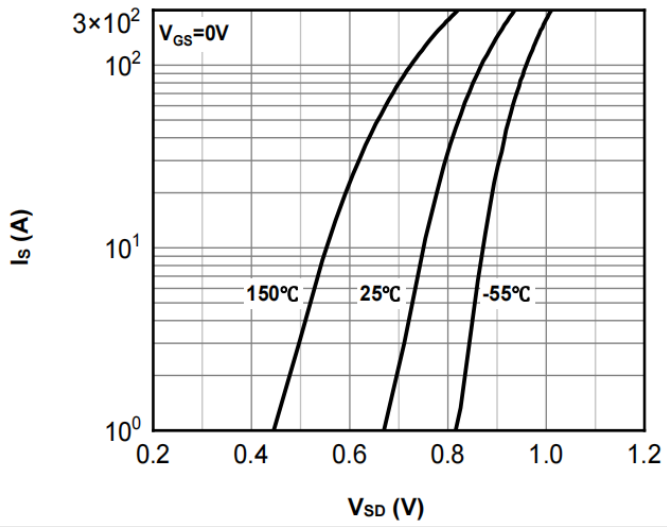


Fig.8 Safe operating area

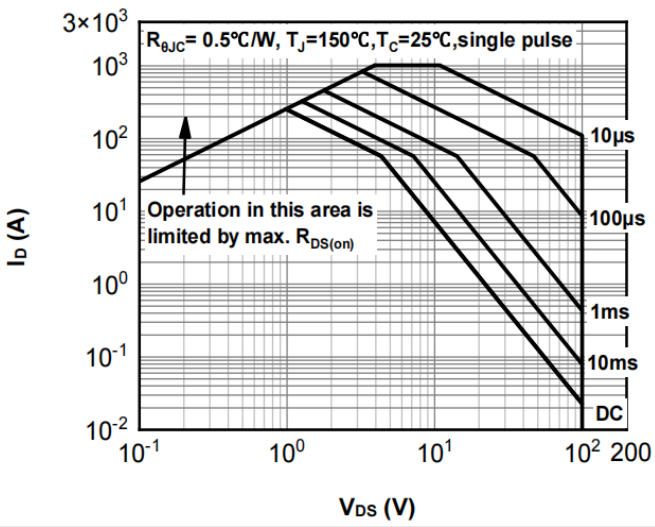


Fig.9 Typ. Capacitance

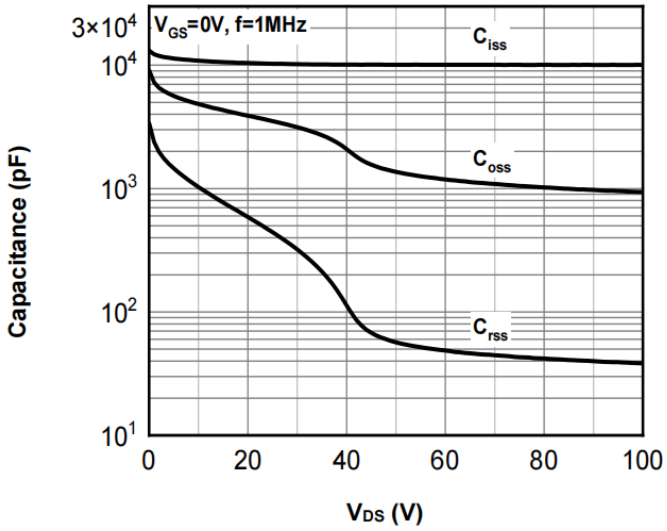


Fig.10 Single pulse maximum power dissipation

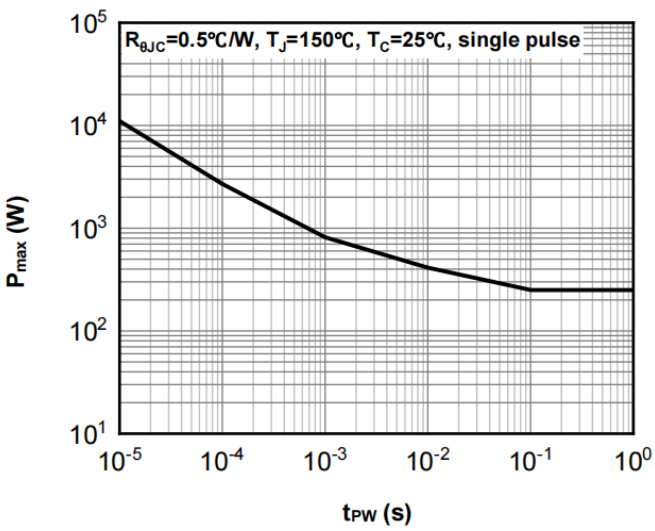


Fig.11 Max. power dissipation vs case temperature

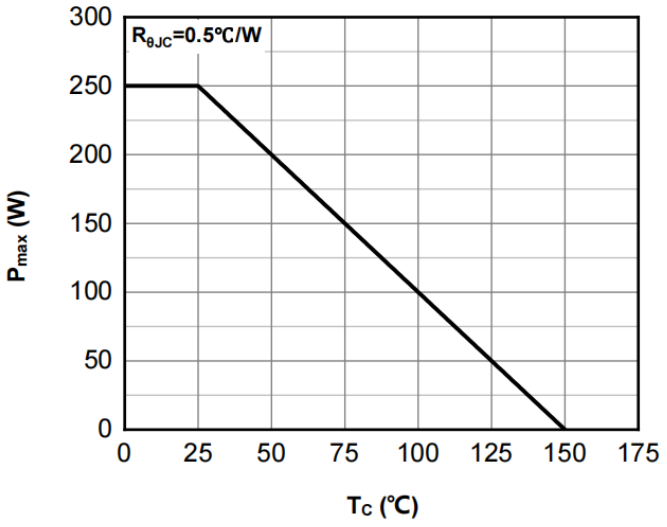


Fig.12 Max. continuous drain current vs case temperature

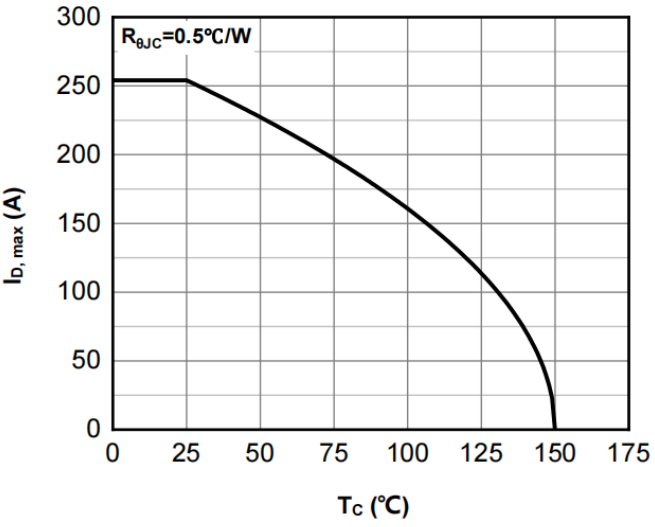


Fig.13 Normalized $V_{(BR)DSS}$ vs junction temperature

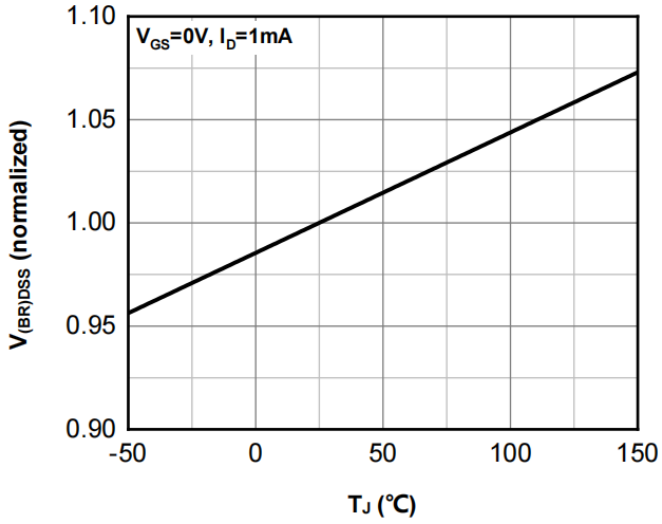


Fig.14 Normalized $V_{GS(th)}$ vs junction temperature

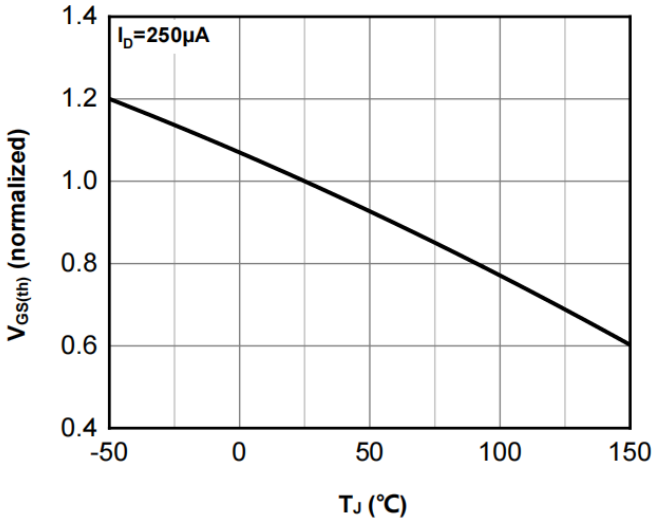
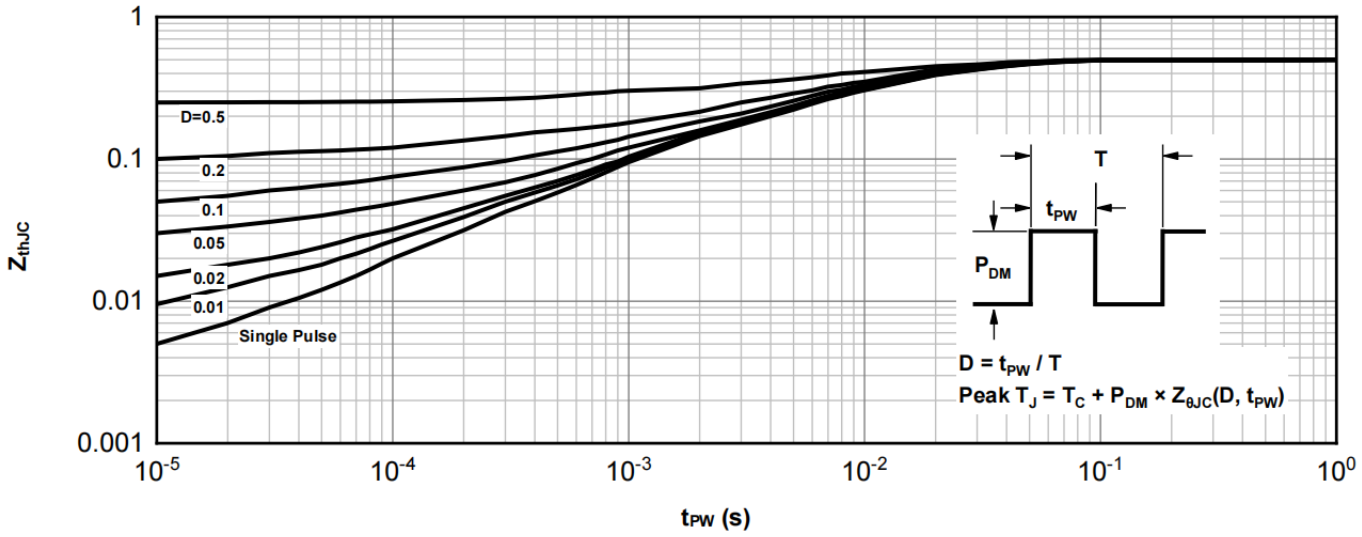
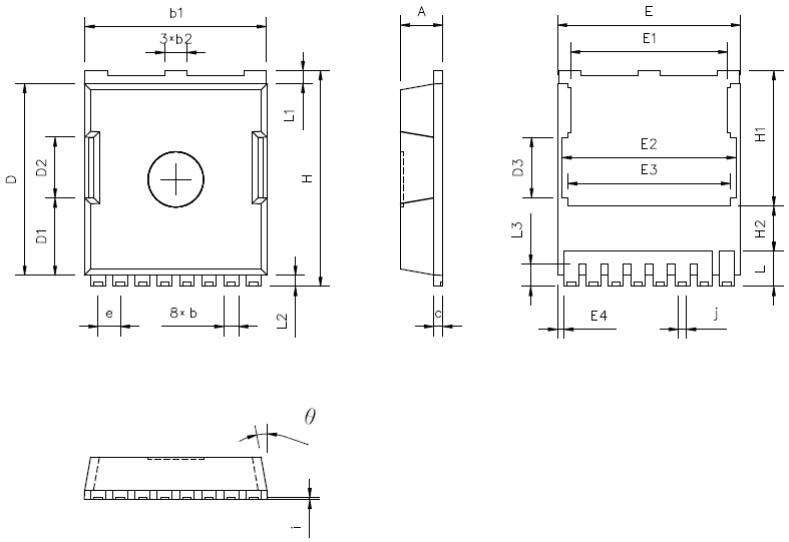


Fig.15 Transient thermal impedance from junction to case



Package outline dimensions:TOLL



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		

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