

Preliminary Specification: Subject to Change without Notice

N-Channel 80 V MOSFET

Product summary

V_{DS} (V)	$R_{DS(on),max}$ (m Ω)	I_D (A)
80	0.95 @ $V_{GS} = 10V$	385 ⁽¹⁾

Features

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

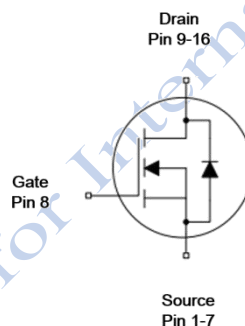
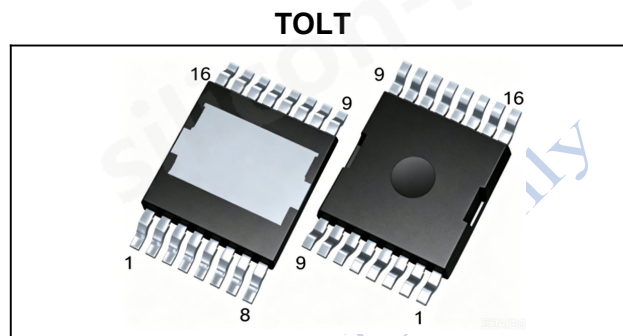
Applications

- DC/DC conversion
- Power switch
- Motor drives

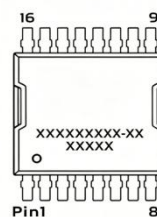
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Package and ordering information

Ordering code	Package	Device code
SDN08N0P9QF-BA	TOLT	N08N0P9QF-BA



RoHS
COMPLIANT
HALOGEN
FREE



XXXXXXXXXX-XX
Device code
XXXXXX
Lot number
Work week code
Year code

1. Maximum ratings

Absolute maximum ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	80	V
Gate-source voltage	V_{GS}	± 20	
Continuous drain current	$T_C = 25^\circ\text{C}$ ⁽¹⁾	385	A
	$T_C = 100^\circ\text{C}$	314	
	$T_A = 25^\circ\text{C}$ ⁽⁴⁾	44.2	
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	1540	
Avalanche energy, single pulse ⁽³⁾	E_{AS}	1100	mJ
Power dissipation	$T_C = 25^\circ\text{C}$	375	W
	$T_A = 25^\circ\text{C}$ ⁽⁴⁾	3.7	
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

2. Thermal resistance ratings

Thermal resistance ratings				
Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	0.4	°C/W
Thermal resistance, junction-to-ambient ⁽⁴⁾	Steady state	$R_{\theta JA}$	40	

3. Electrical Characteristics

Electrical characteristics (T _J = 25°C unless otherwise noted)						
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	80			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 1 mA	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} = 80 V, V _{GS} = 0 V			1	µA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A		0.84	0.95	mΩ
Forward transconductance ⁽⁵⁾	g _{fs}	V _{DS} = 5 V, I _D = 20 A		83		S
Gate resistance	R _g	f = 1 MHz		0.7		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = 40 V, I _D = 20 A, V _{GS} = 10 V		139.3		nC
Gate-source charge	Q _{gs}			48.0		
Gate-drain charge	Q _{gd}			24.6		
Turn-on delay time	t _{d(on)}	V _{DS} = 40 V, I _D = 20 A, V _{GS} = 10 V, R _{GEN} = 1.6 Ω		71.1		ns
Rise time	t _r			28.0		
Turn-off delay time	t _{d(off)}			52.8		
Fall time	t _f			16.0		
Input capacitance	C _{iss}	V _{DS} = 40 V, V _{GS} = 0 V, f = 1 MHz		10109		pF
Output capacitance	C _{oss}			3188		
Reverse transfer capacitance	C _{rss}			78		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 20 A		0.8	1.1	V
Reverse recovery time	t _{rr}	V _{DS} = 40 V, I _F = 20 A, di/dt = 1000 A/µs		102		ns
Reverse recovery charge	Q _{rr}			470		nC

Notes

- (1) Package limited.
- (2) Pulse width limited by maximum junction temperature.
- (3) $V_{DS} = 20\text{ V}, V_{GS} = 10\text{ V}, L = 1\text{ mH}$.
- (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.

4. Electrical characteristics diagrams

Fig.1 Typ. transfer characteristics

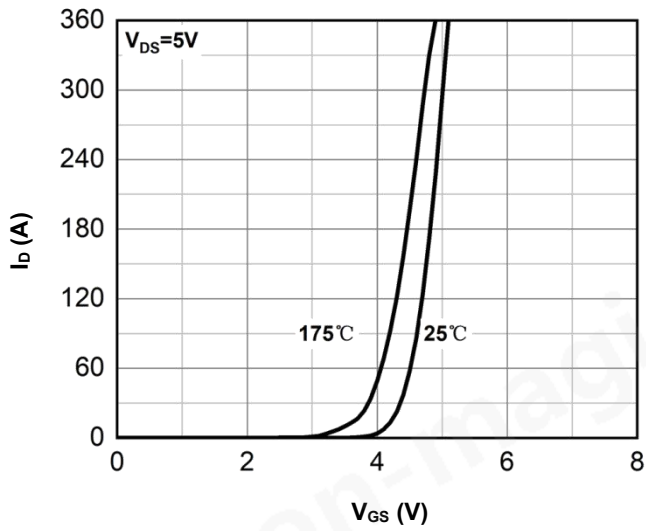


Fig.2 Typ. output characteristics

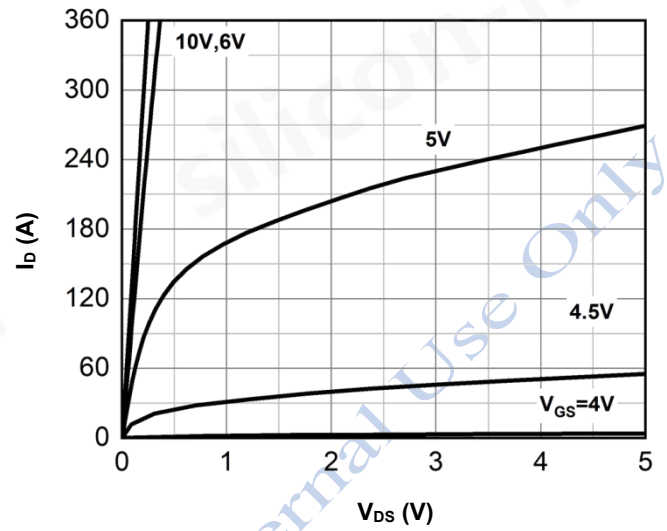


Fig.3 Normalized on-resistance vs drain current

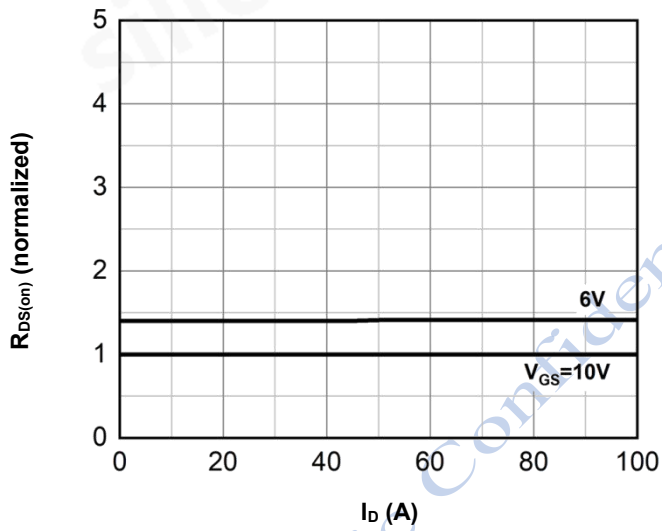


Fig.4 Typ. on-resistance vs gate-source voltage

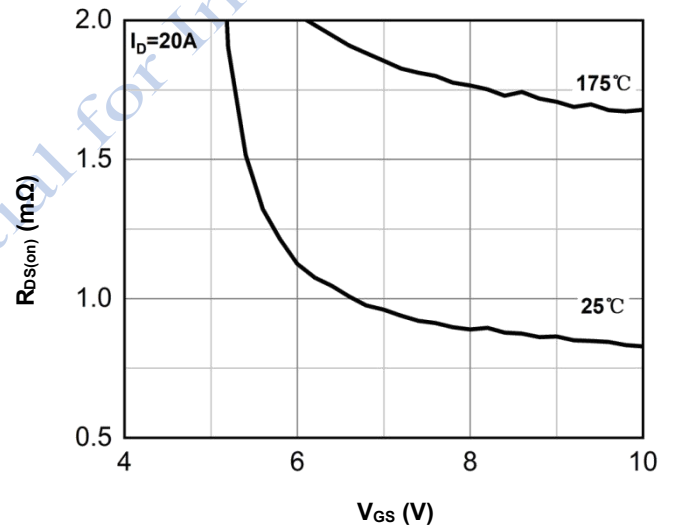


Fig.5 Normalized on-resistance vs junction temperature

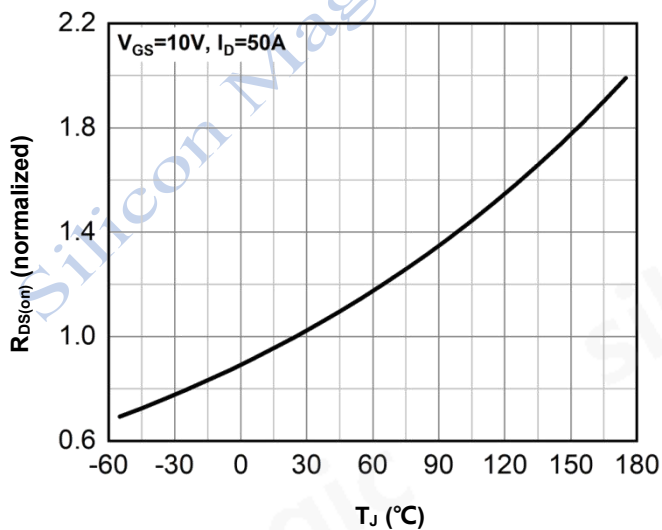


Fig.6 Typ. gate charge

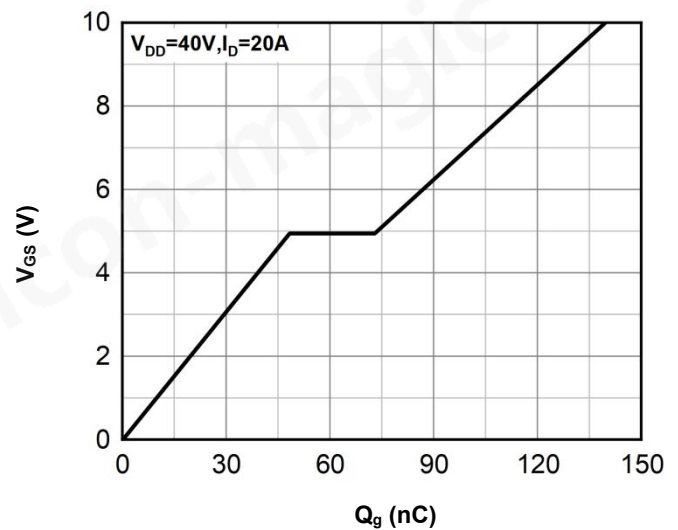


Fig.7 Typ. forward characteristics of body diode

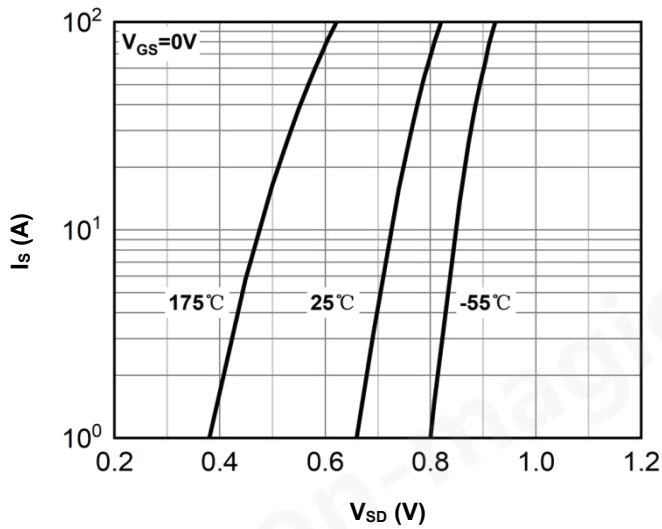


Fig.8 Safe operating area

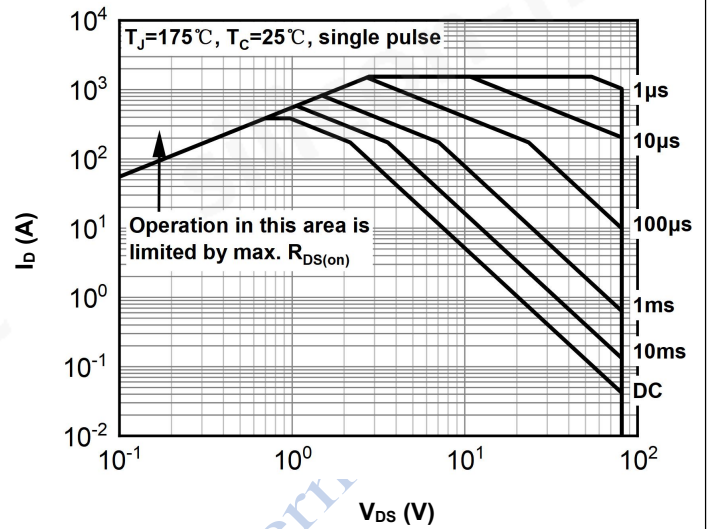


Fig.9 Typ. Capacitance

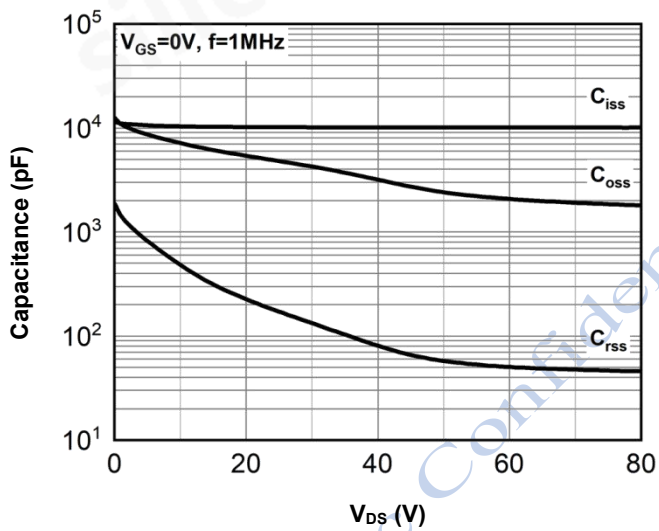


Fig.10 Single pulse maximum power dissipation

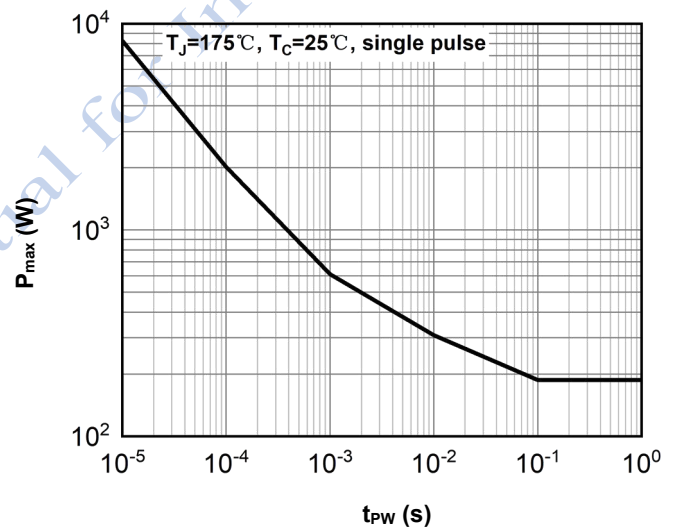


Fig.11 Max. power dissipation vs case temperature

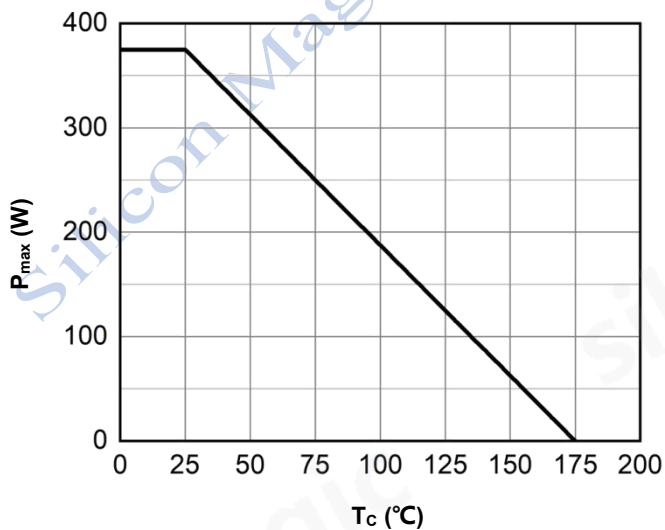


Fig.12 Max. continuous drain current vs case temperature

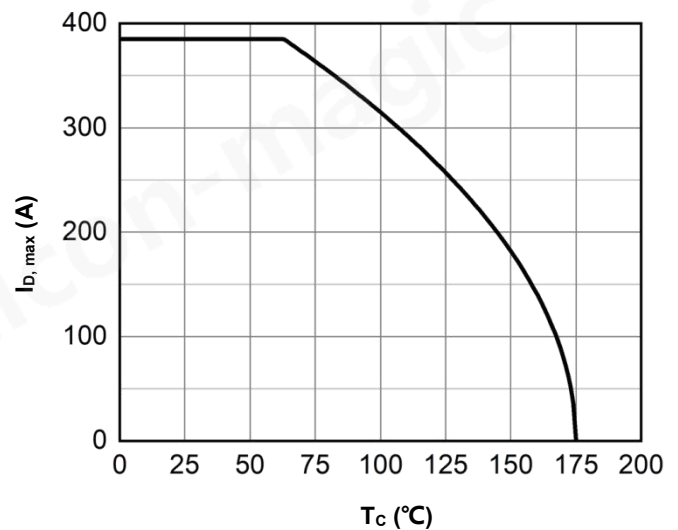


Fig.13 Normalized $V_{(BR)DSS}$ vs junction temperature

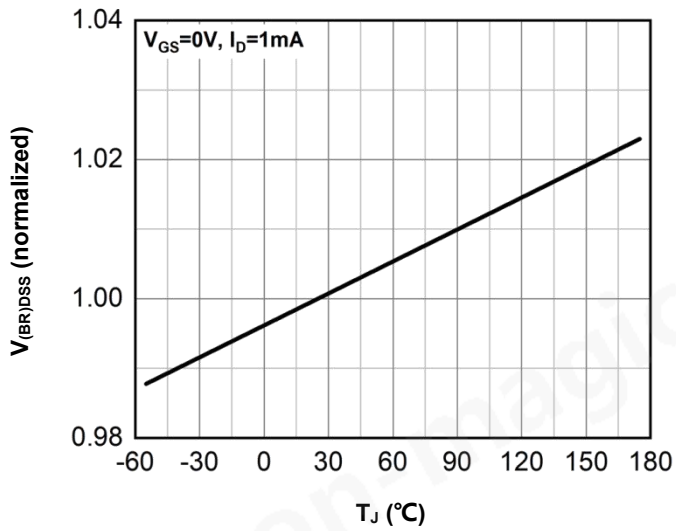


Fig.14 Normalized $V_{GS(th)}$ vs junction temperature

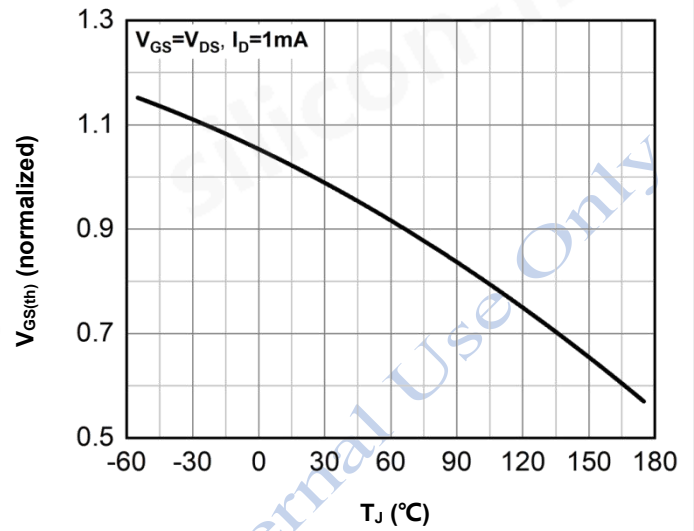
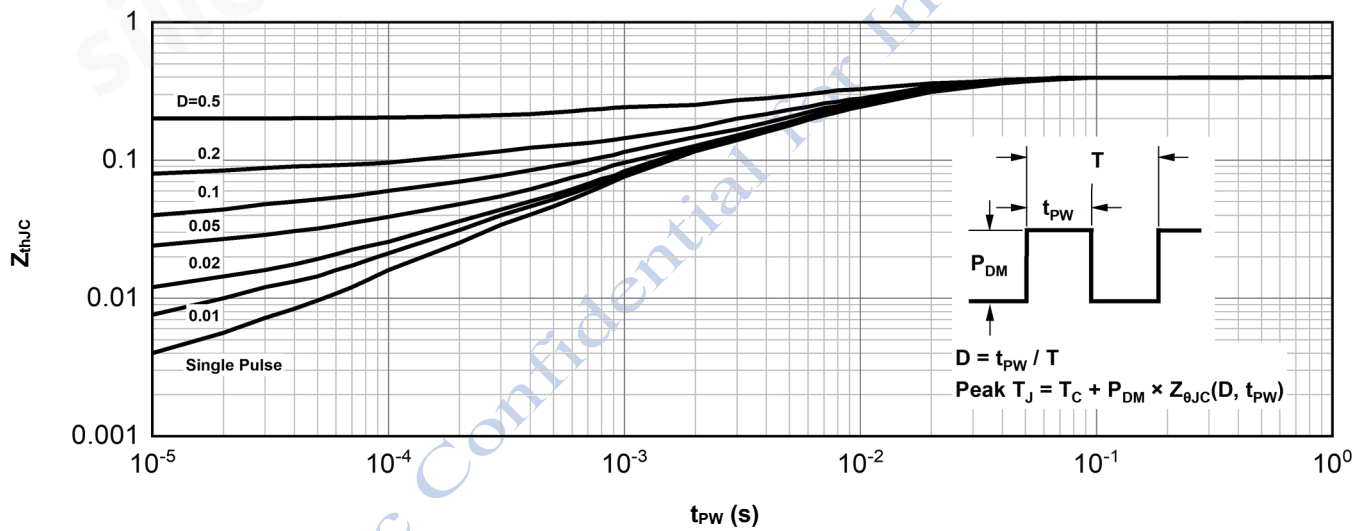
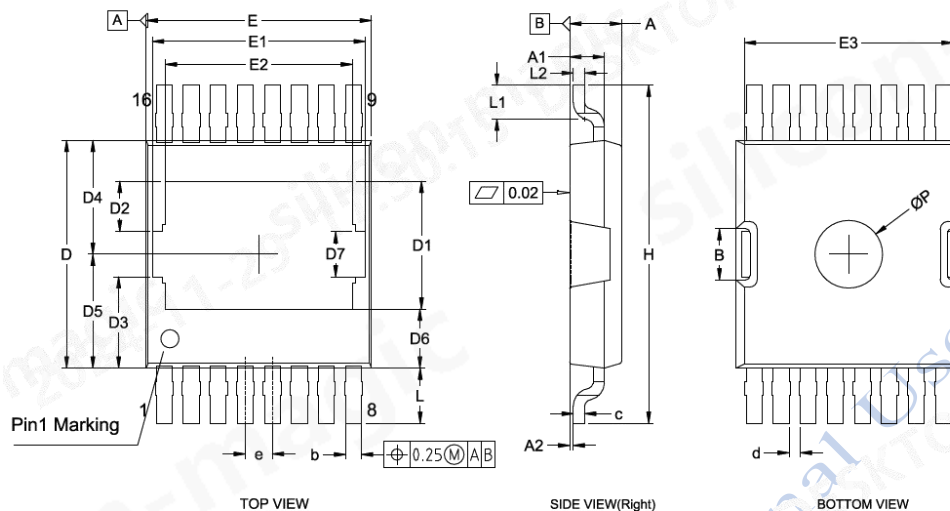


Fig.15 Transient thermal impedance from junction to case



5. Package outline dimensions



Dim	Millimeters		
	Min	Nom	Max
A	2.250	2.300	2.350
A1	1.440	1.540	1.640
A2	0.010	—	0.160
b	0.600	0.700	0.800
c	0.400	0.500	0.600
d	0.400	0.500	0.600
e	1.200 BSC		
D	10.000	10.100	10.300
D1	5.470	5.670	5.870
D2	2.040	2.240	2.440
D3	4.050 REF		
D4	5.050 REF		
D5	5.050 REF		
D6	2.620 REF		
D7	2.000 REF		
E	9.700	10.000	10.100
E1	9.460 REF		
E2	8.100	8.300	8.500
E3	9.070	9.270	9.470
H	14.800	15.000	15.200
L	2.250	2.450	2.650
L1	1.350	1.500	1.650
L2	0.500 BSC		
P	2.900	3.000	3.100
B	2.180	2.280	2.380

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