

N-Channel 100 V MOSFET

Product summary

V_{DS} (V)	$R_{DS(on),max}$ (m Ω)	I_D (A)
100	5.8 @ $V_{GS} = 10V$	106 ⁽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

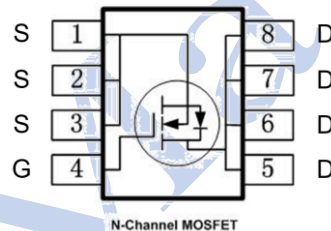
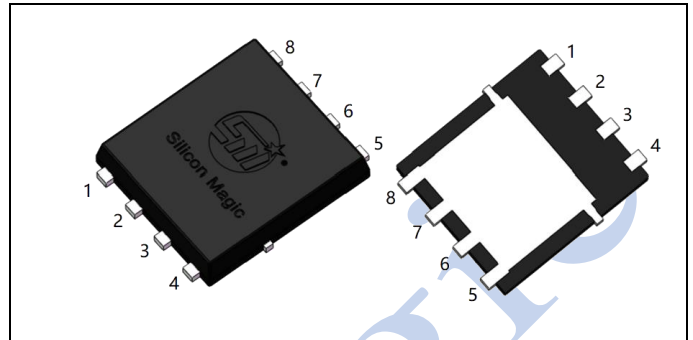
Ordering code	Package	Device code
SDN10K5P2C-AD	PDFN5*6-8L	AHX

1. Maximum ratings

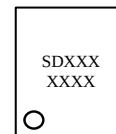
Absolute maximum ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current	$T_C = 25^\circ\text{C}$ ⁽¹⁾	I_D	106	A
	$T_C = 100^\circ\text{C}$		67	
	$T_A = 25^\circ\text{C}$ ⁽⁴⁾		15	
Pulsed drain current ⁽²⁾		$I_{D,pulse}$	424	
Avalanche energy, single pulse ⁽³⁾		E_{AS}	176	mJ
Power dissipation	$T_C = 25^\circ\text{C}$	P_D	125	W
	$T_A = 25^\circ\text{C}$ ⁽⁴⁾		2.7	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

PDFN5*6-8L



RoHS
COMPLIANT
HALOGEN
FREE



SDXXX

Device code
Silicon Magic discrete device

XXXX

Wafer lot number
Work week code
Year code

2. Thermal resistance ratings

Thermal resistance ratings				
Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	1.0	°C/W
Thermal resistance, junction-to-ambient ⁽⁴⁾	Steady state	$R_{\theta JA}$	45	

3. Electrical Characteristics

Electrical characteristics						
Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter						
Drain to source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0, I_D = 250 \mu A$	100			V
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1.1	1.7	2.3	V
Gate-body leakage	I_{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100 V, V_{GS} = 0 V$			1	μA
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10 V, I_D = 40 A$		5.2	5.8	m Ω
		$V_{GS} = 4.5 V, I_D = 20 A$		8	10	
Forward transconductance ⁽⁵⁾	g_{fs}	$V_{DS} = 5 V, I_D = 40 A$		70		S
Gate resistance	R_g	$f = 1MHz$		2		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q_g	$V_{DS} = 50 V, I_D = 20 A, V_{GS} = 4.5 V$		26		nC
Total gate charge	Q_g	$V_{DS} = 50 V, I_D = 40 A, V_{GS} = 10 V$		53		
Gate-source charge	Q_{gs}			12		
Gate-drain charge	Q_{gd}			9		
Turn-on delay time	$t_{d(on)}$	$V_{DS} = 50 V, I_D = 40 A, V_{GS} = 10 V, R_{GEN} = 6 \Omega$		22		ns
Rise time	t_r			56		
Turn-off delay time	$t_{d(off)}$			81		
Fall time	t_f			14		
Input capacitance	C_{iss}	$V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz$		3540		pF
Output capacitance	C_{oss}			435		
Reverse transfer capacitance	C_{rss}			15		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V_{SD}	$V_{GS} = 0 V, I_F = 40 A$		0.9	1.2	V
Reverse recovery time	t_{rr}	$V_{DS} = 50 V, I_F = 40 A, di/dt = 100 A/\mu s$		50		ns
Reverse recovery charge	Q_{rr}			51		nC

Notes

- (1) Limited by maximum junction temperature.
- (2) Pulse width limited by maximum junction temperature.
- (3) $V_{DS} = 50 V, V_{GS} = 10 V, L = 0.1 mH$.
- (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

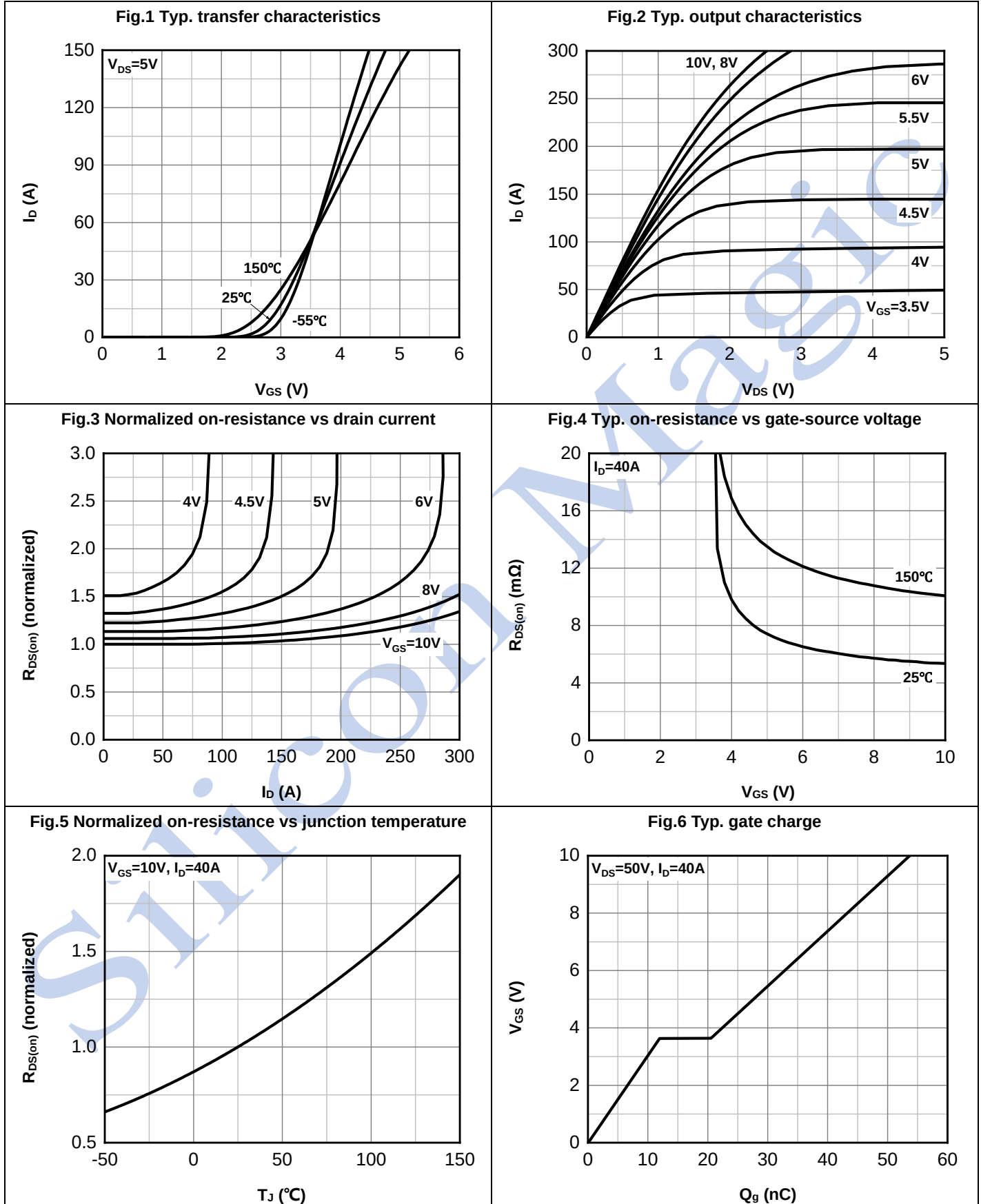


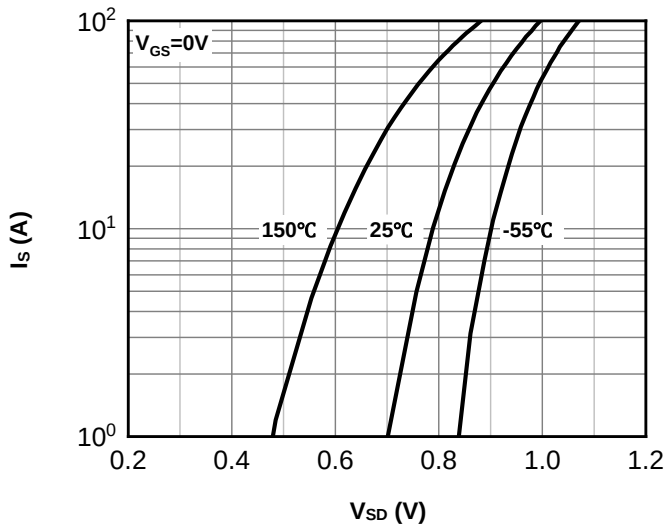
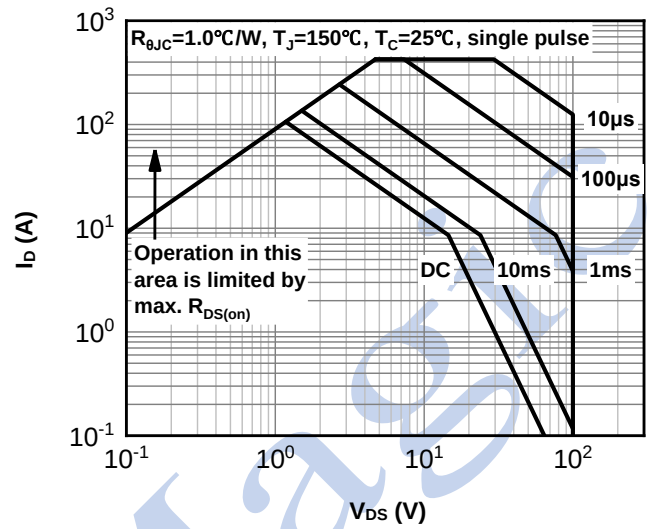
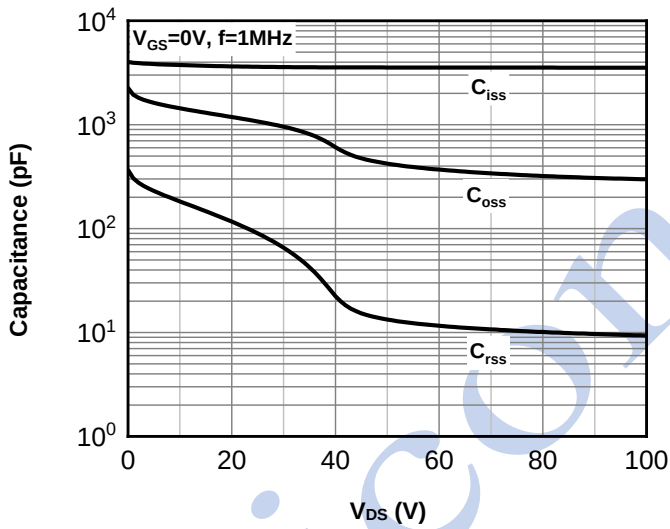
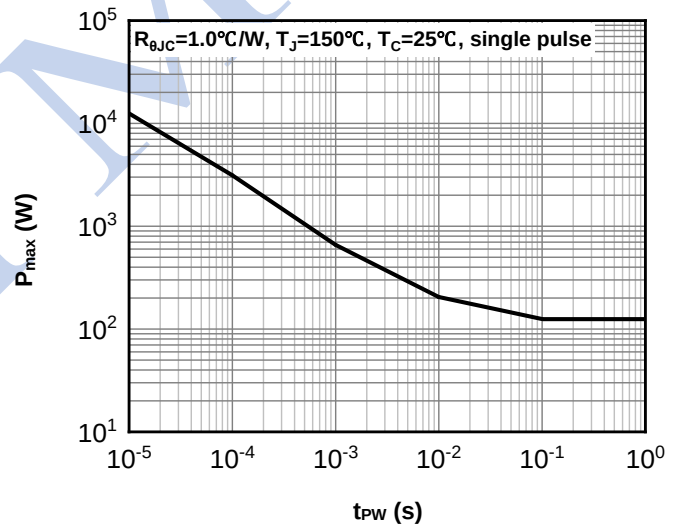
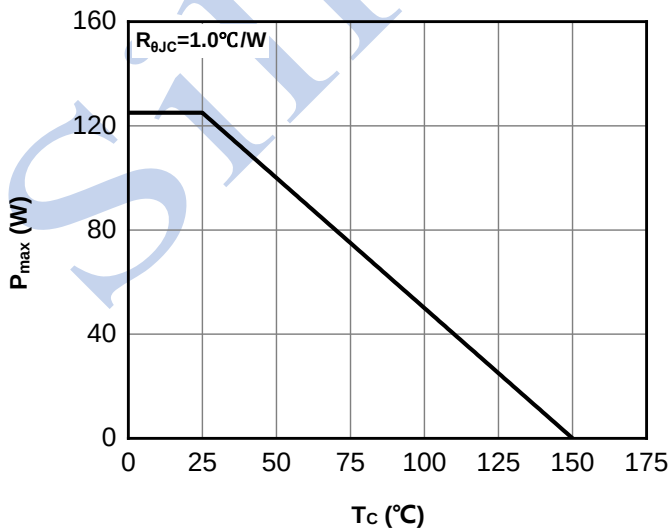
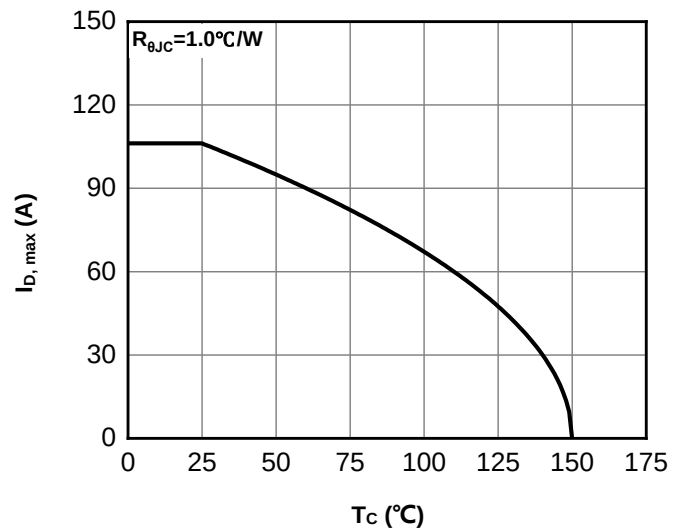
Fig.7 Typ. forward characteristics of body diode

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

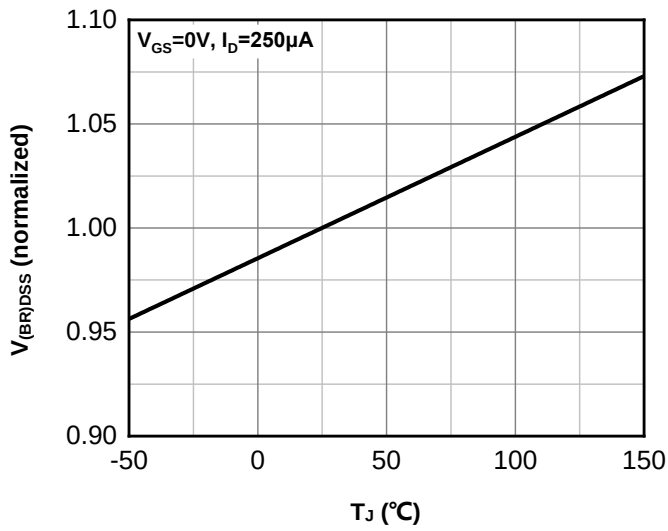


Fig.14 Normalized $V_{GS(th)}$ vs junction temperature

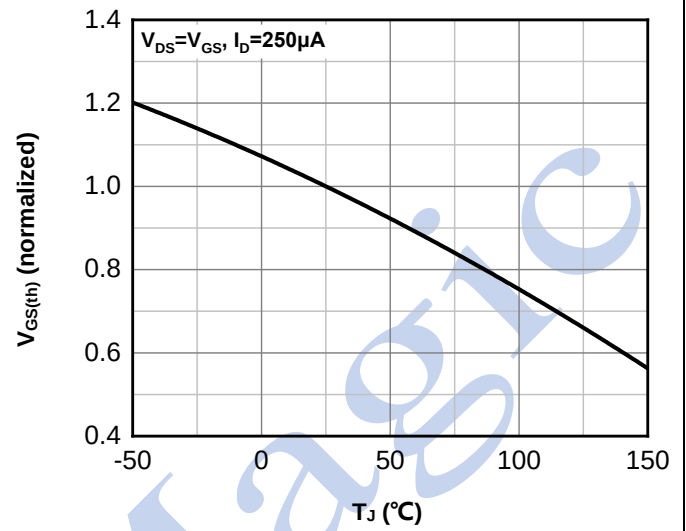
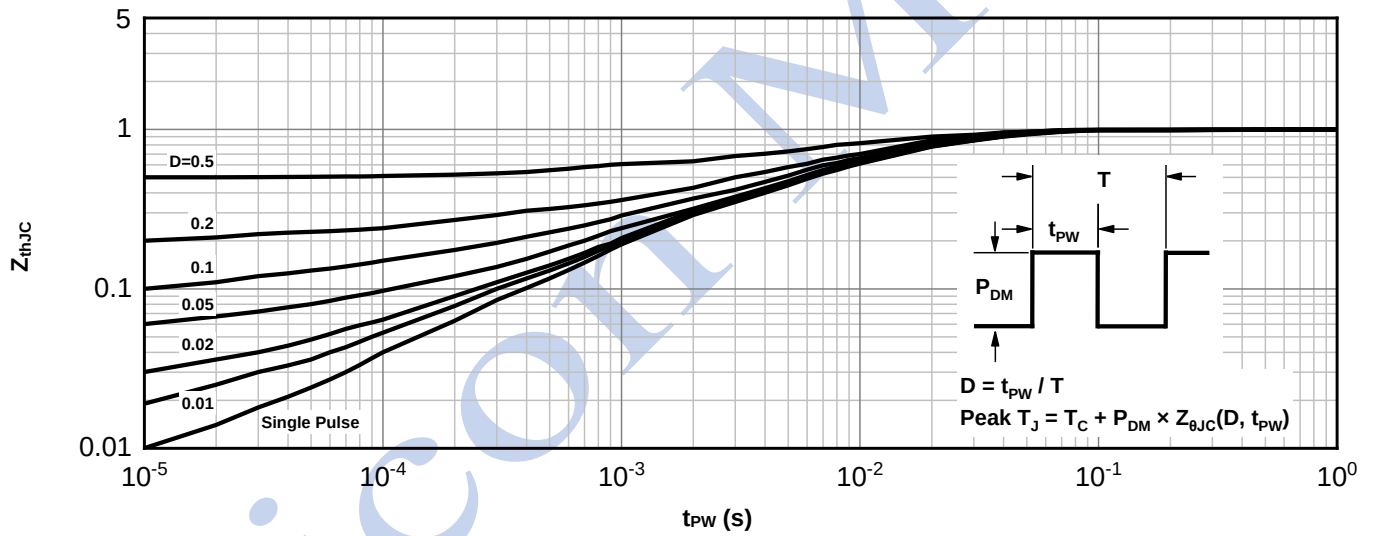
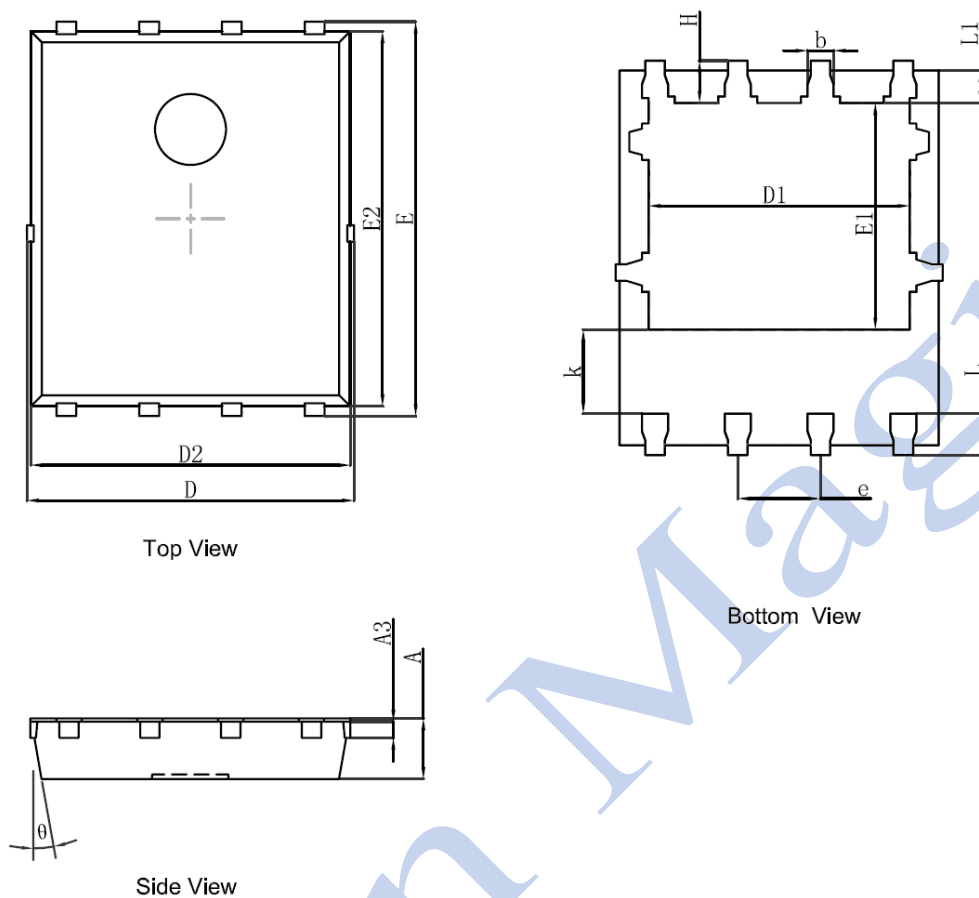


Fig.15 Transient thermal impedance from junction to case



5. Package outline dimensions



Dim	Millimeters		
	Min	Nom	Max
A	0.900	-	1.000
A3	0.254 REF		
D	4.944	-	5.096
E	5.974	-	6.126
D1	3.910	-	4.110
E1	3.375	-	3.575
D2	4.824	-	4.976
E2	5.674	-	5.826
k	1.190	-	1.390
b	0.350	-	0.450
e	1.270 TYP		
L	0.559	-	0.711
L1	0.424	-	0.576
H	0.574	-	0.726
θ	10°	-	12°

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