

N-Channel 100 V MOSFET

Product summary

V_{DS} (V)	$R_{DS(on),max}$ (m Ω)	I_D (A)
100	4.9 @ $V_{GS} = 10V$	80 ⁽¹⁾

Features

- Low $R_{DS(on)}$ trench 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

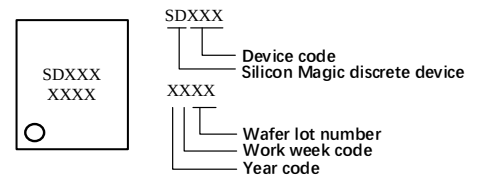
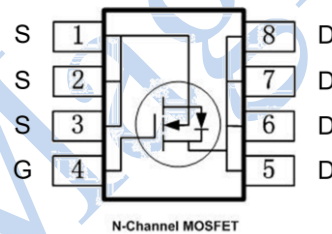
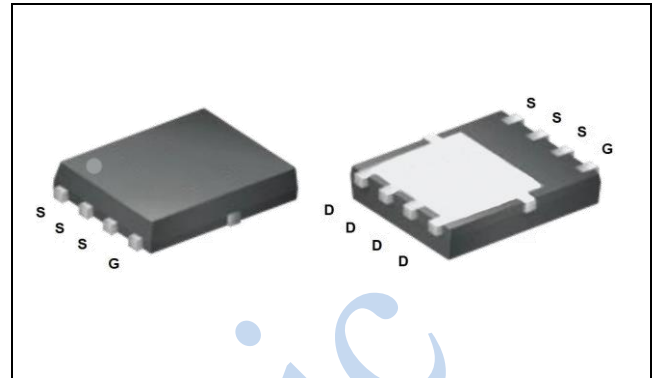
Ordering code	Package	Device code
SDN10N4P9S2C	PDFN5X6-8L	ABY

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	80	A
	$T_C=100^{\circ}\text{C}$ ⁽¹⁾		80	
	$T_A=25^{\circ}\text{C}$ ⁽⁴⁾		17	
Pulsed drain current ⁽²⁾		$I_{D,pulse}$	320	
Avalanche energy, single pulse ⁽³⁾		E_{AS}	254	mJ
Power dissipation	$T_C=25^{\circ}\text{C}$	P_D	156	W
	$T_A=25^{\circ}\text{C}$ ⁽⁴⁾		2.7	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	°C

PDFN5X6-8L



2. Thermal resistance ratings

Thermal resistance ratings						
Parameter		Symbol	Max.	Unit		
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	0.8	°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	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100			V
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.2	3	3.8	V
Gate-body leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$			1	μA
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 17\text{ A}$		3.6	4.9	m Ω
Forward transconductance ⁽⁵⁾	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 17\text{ A}$		51		S
Gate resistance	R_g			1	2	Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q_g	$V_{DS} = 50\text{ V}, I_D = 17\text{ A}, V_{GS} = 10\text{ V}$		77	108	nC
Gate-source charge	Q_{gs}			17	24	
Gate-drain charge	Q_{gd}			24	34	
Turn-on delay time	$t_{d(on)}$	$V_{DS} = 50\text{ V}, I_D = 17\text{ A}, V_{GS} = 10\text{ V},$ $R_{GEN} = 6\text{ }\Omega$		32	64	ns
Rise time	t_r			28	56	
Turn-off delay time	$t_{d(off)}$			75	150	
Fall time	t_f			31	62	
Input capacitance	C_{iss}	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		4350	6090	pF
Output capacitance	C_{oss}			675	945	
Reverse transfer capacitance	C_{rss}			7	14	
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_F = 17\text{ A}$		0.8	1.1	V
Reverse recovery time	t_{rr}	$V_{DS} = 50\text{ V}, I_F = 17\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		71	128	ns
Reverse recovery charge	Q_{rr}			162	292	nC

Notes

- (1) Package limited.
- (2) Pulse width limited by maximum junction temperature.
- (3) $V_{DS} = 75\text{ V}, V_{GS} = 10\text{ V}, L = 0.3\text{ mH}$.
- (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

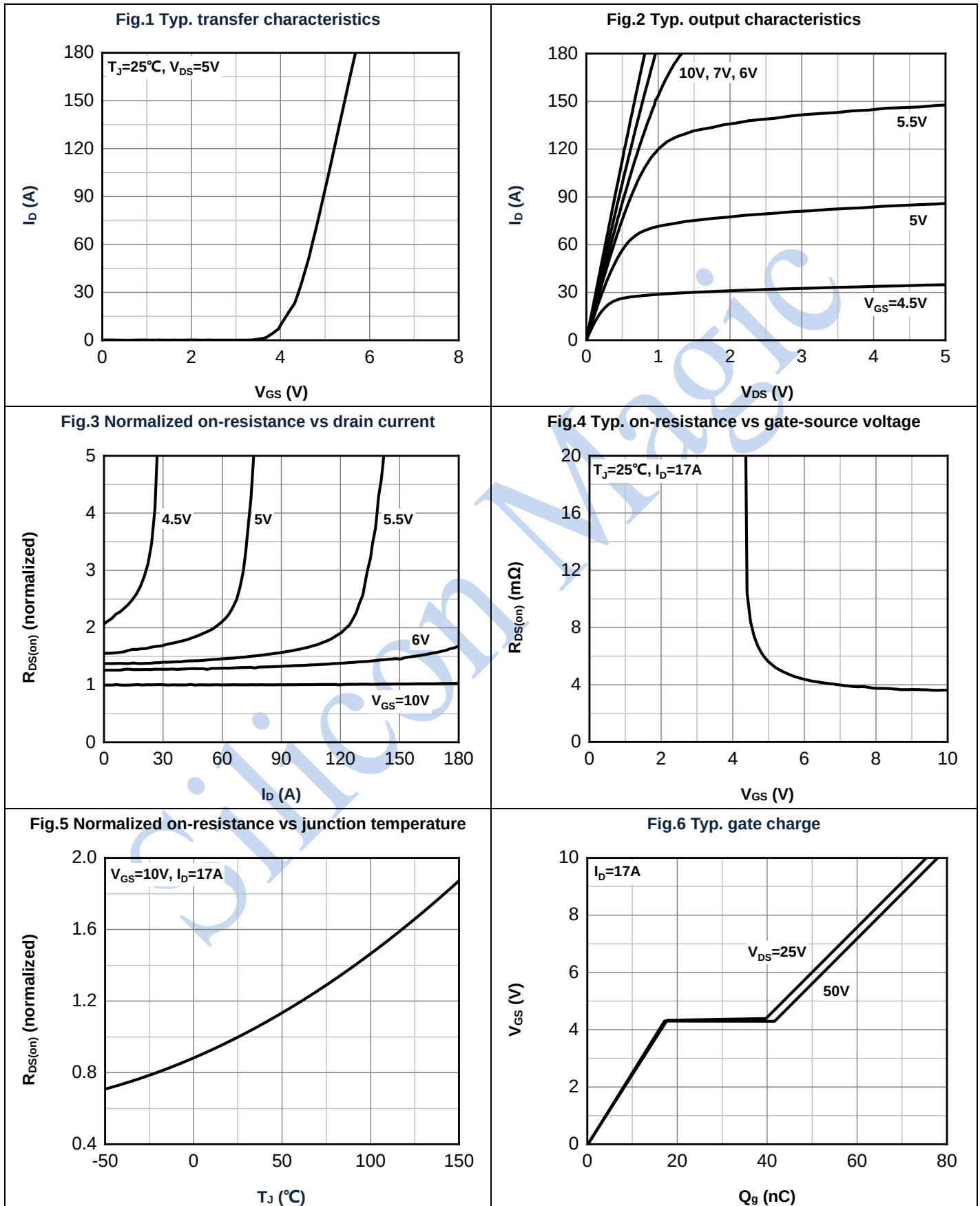


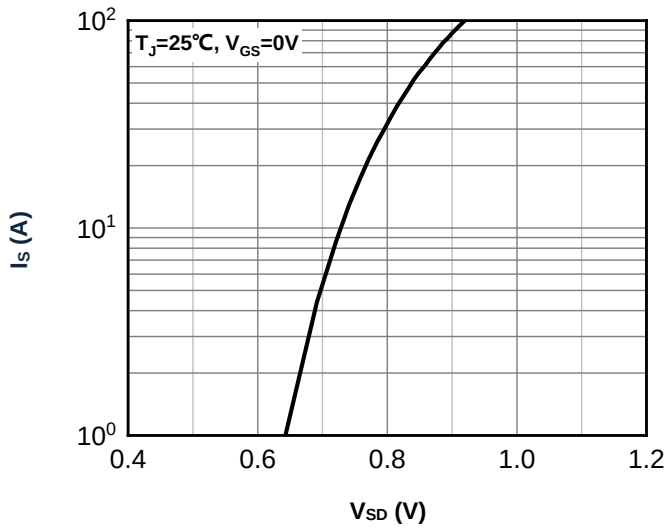
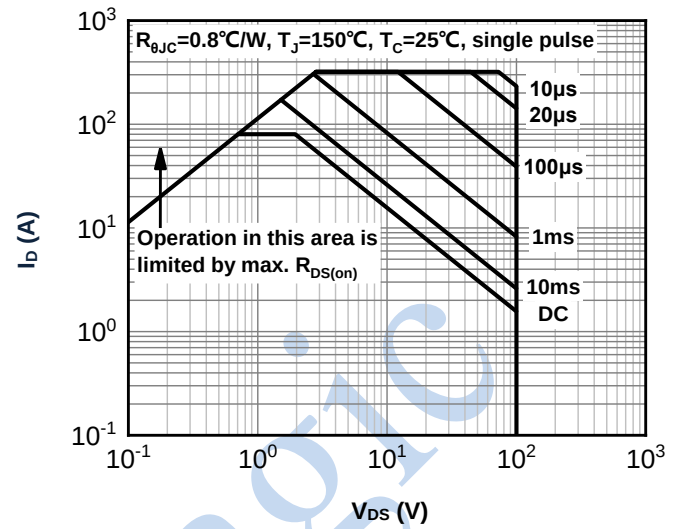
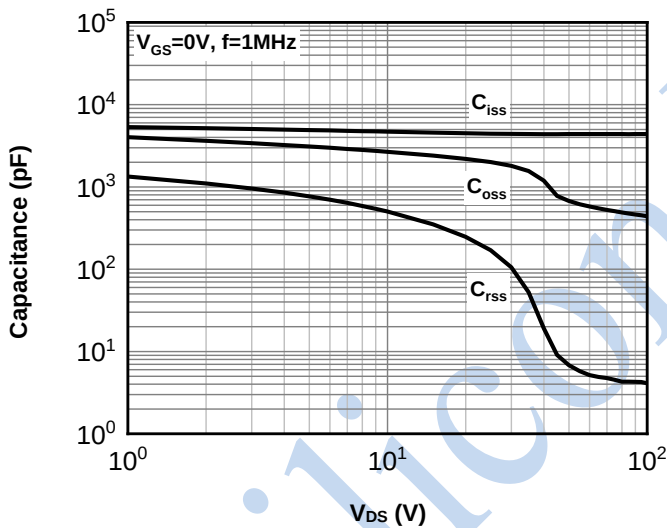
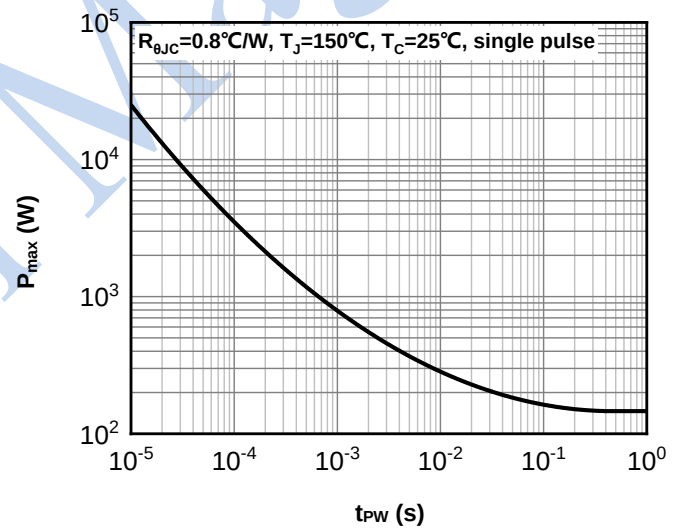
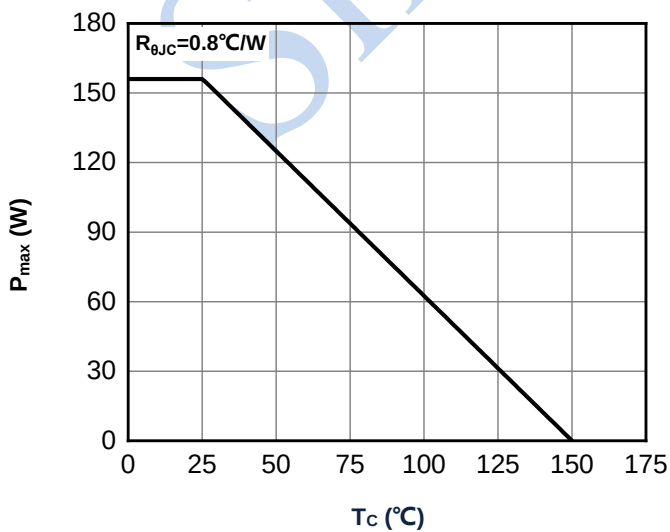
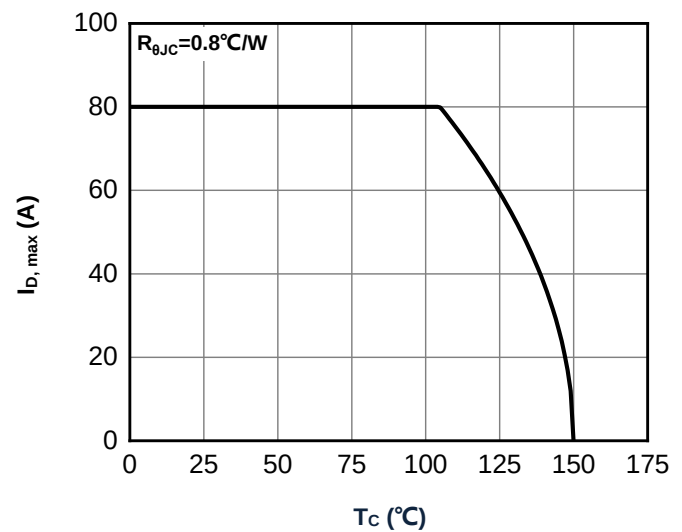
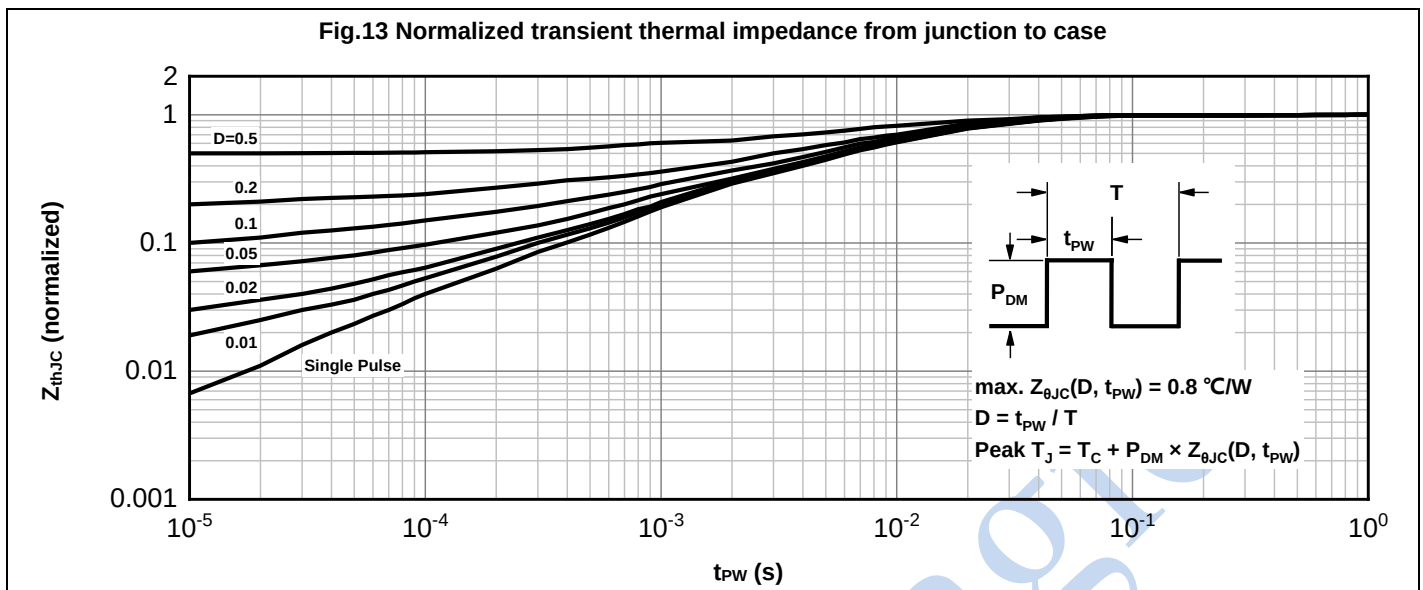
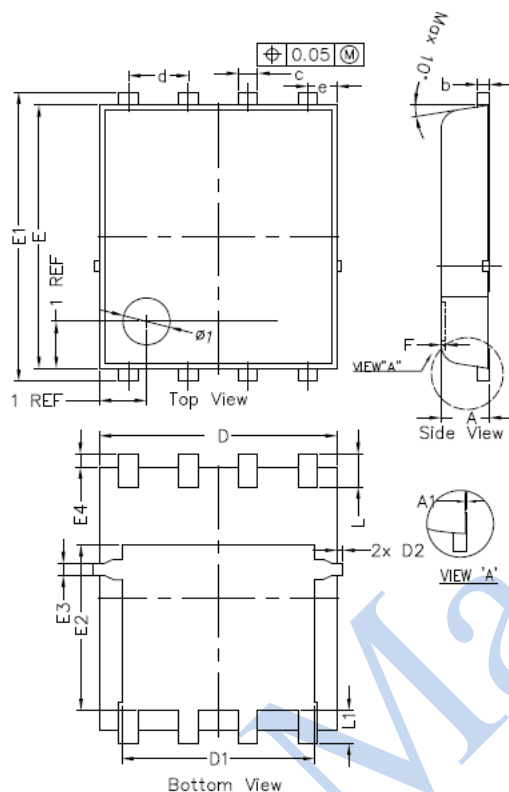
Fig.7 Typ. forward characteristics of body diode

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 transient thermal impedance from junction to case



5. Package outline dimensions



Dim	Millimeters		
	Min	Nom	Max
A	0.900	1.000	1.100
A1	0.000	---	0.050
b	0.246	0.254	0.312
c	0.310	0.410	0.510
d	1.27BSC		
D	4.950	5.050	5.150
D1	4.000	4.100	4.200
D2	---	---	0.125
e	0.62BSC		
E	5.500	5.600	5.700
E1	6.050	6.150	6.250
E2	3.425	3.525	3.625
E3	0.150	0.250	0.350
E4	0.175	0.275	0.375
F	---	---	0.100
L	0.500	0.600	0.700
L1	0.600	0.700	0.800

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