

N-Channel 60V MOSFET

Product summary

V_{DS} (V)	$R_{DS(on),max}$ (m Ω)	I_D (A)
60	7 @ $V_{GS} = 10V$	52 ⁽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

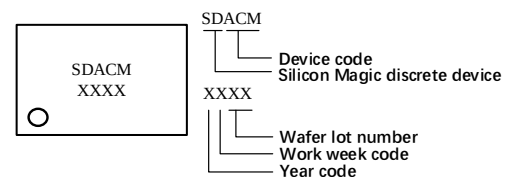
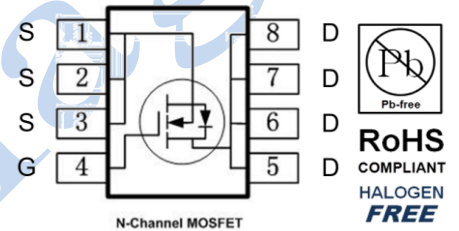
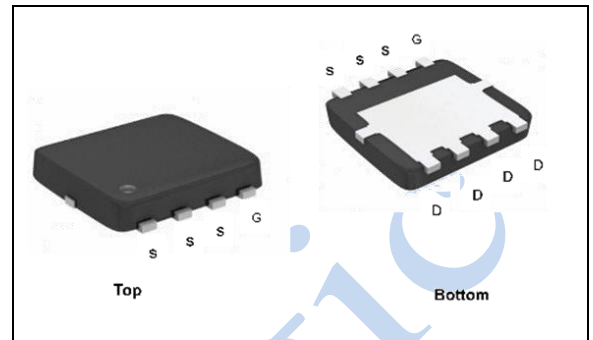
Ordering code	Package	Device code
SDN06K007S2C	PDFN5X6-8L	ACM

1. Maximum ratings

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

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	60	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	$T_C=25^{\circ}\text{C}$ ⁽¹⁾	I_D	52	A
	$T_C=100^{\circ}\text{C}$		40	
	$T_A=25^{\circ}\text{C}$ ⁽⁴⁾		14	
Pulsed drain current ⁽²⁾		$I_{D,pulse}$	208	
Avalanche energy, single pulse ⁽³⁾		E_{AS}	84	mJ
Power dissipation	$T_C=25^{\circ}\text{C}$	P_D	52	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	$R_{\theta JC}$	2.4	°C/W		
Thermal resistance, junction-to-ambient ⁽⁴⁾	Steady state	$R_{\theta JA}$	45			

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 = 250 μA	60			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.2	1.9	2.6	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} = 60 V, V _{GS} = 0 V			1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 14 A		6.3	7	mΩ
		V _{GS} = 4.5 V, I _D = 7 A		9.5	14	
Forward transconductance ⁽⁵⁾	g _{fs}	V _{DS} = 5 V, I _D = 14 A		40		S
Gate resistance	R _g	f = 1MHz		1		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = 30 V, I _D = 14 A, V _{GS} = 10 V		24		nC
Gate-source charge	Q _{gs}			3.4		
Gate-drain charge	Q _{gd}			5.8		
Turn-on delay time	t _{d(on)}	V _{DS} = 30 V, I _D = 14 A, V _{GS} = 10 V, R _{GEN} = 2.5 Ω		15		ns
Rise time	t _r			5.5		
Turn-off delay time	t _{d(off)}			35		
Fall time	t _f			6.5		
Input capacitance	C _{iss}	V _{DS} = 30 V, V _{GS} = 0 V, f = 1 MHz		1250		pF
Output capacitance	C _{oss}			450		
Reverse transfer capacitance	C _{rss}			35		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 14 A		0.8	1.1	V
Reverse recovery time	t _{rr}	V _{DS} = 30 V, I _F = 14 A, di/dt = 100 A/μs		36		ns
Reverse recovery charge	Q _{rr}			33		nC

Notes

- (1) Package limited.
- (2) Pulse width limited by maximum junction temperature.
- (3) $V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, L = 0.3\text{ mH}$.
- (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

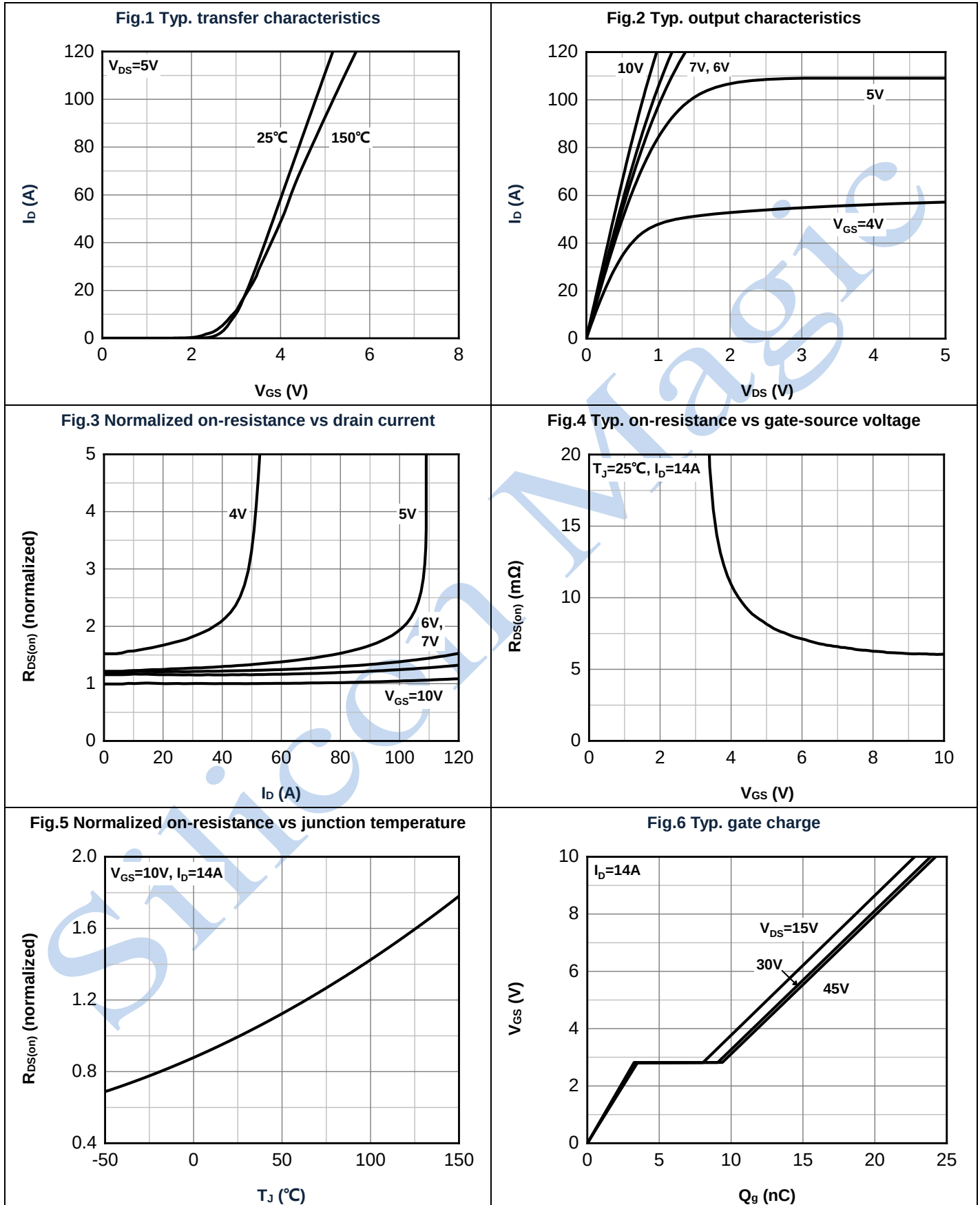


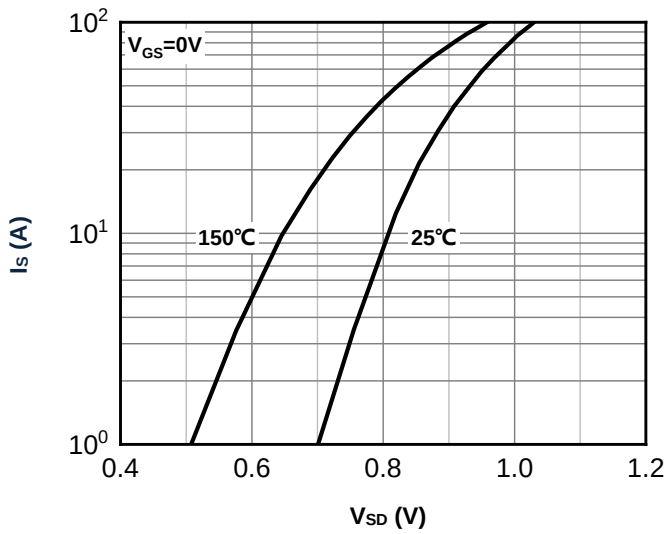
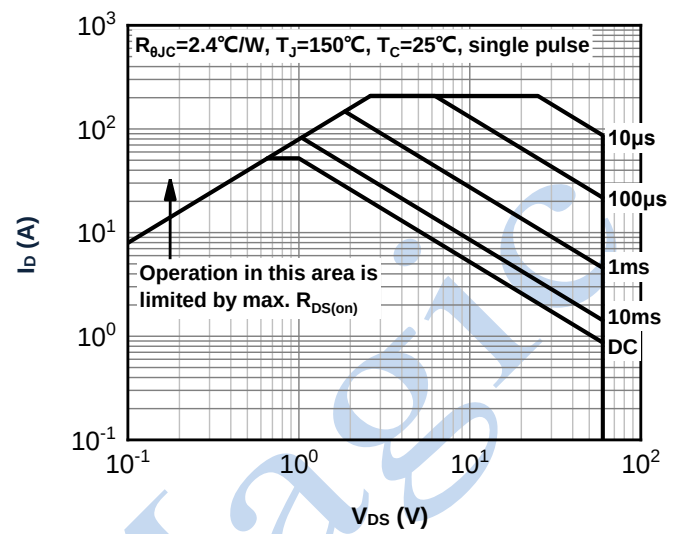
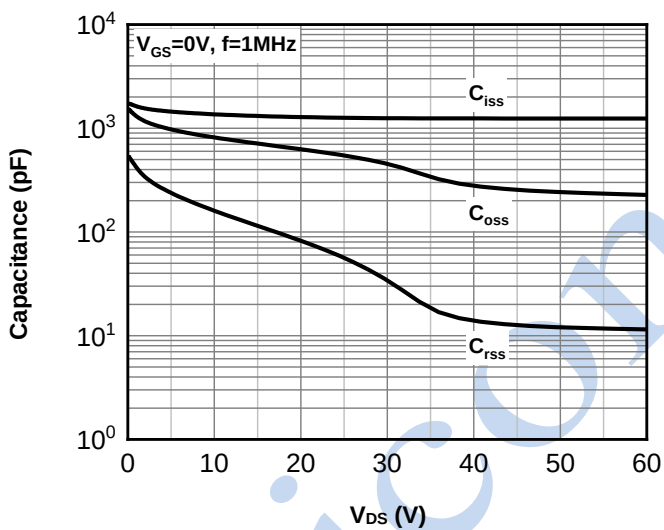
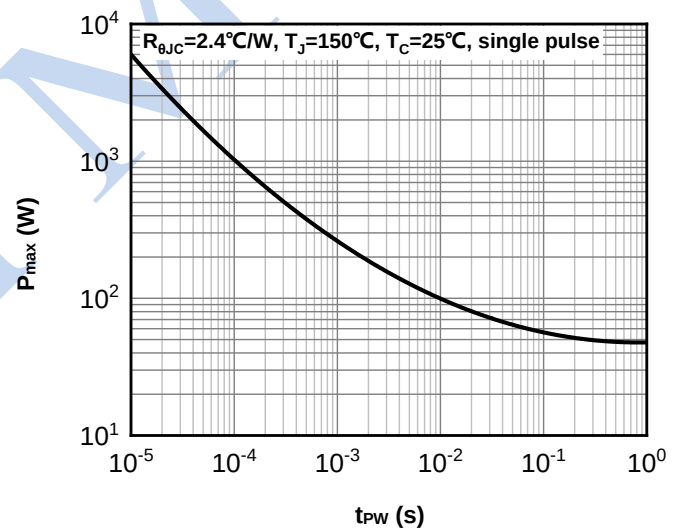
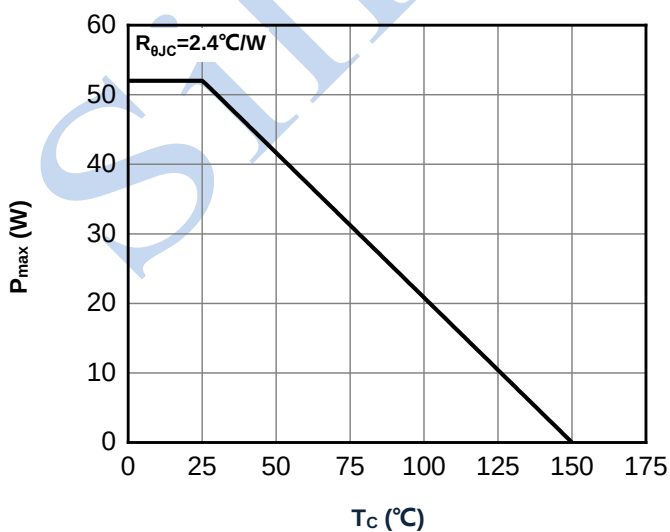
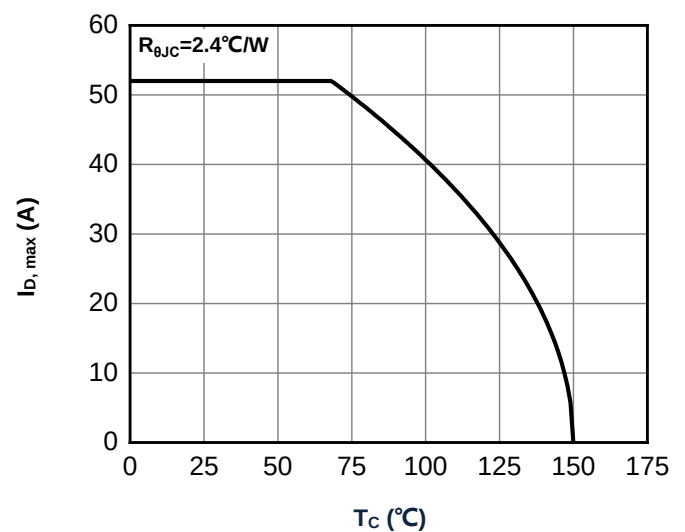
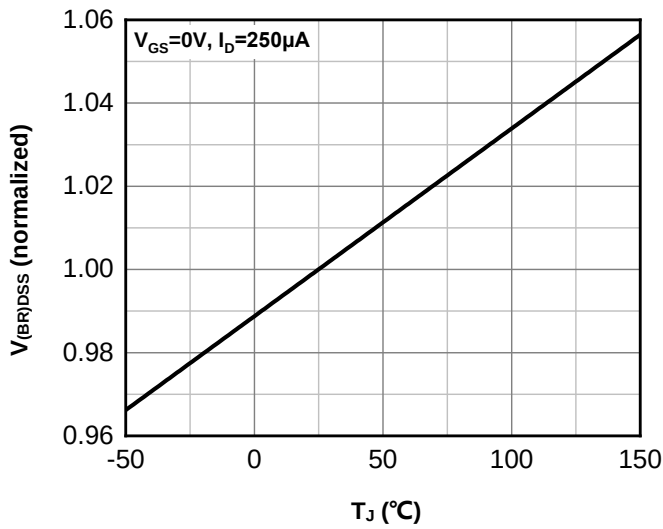
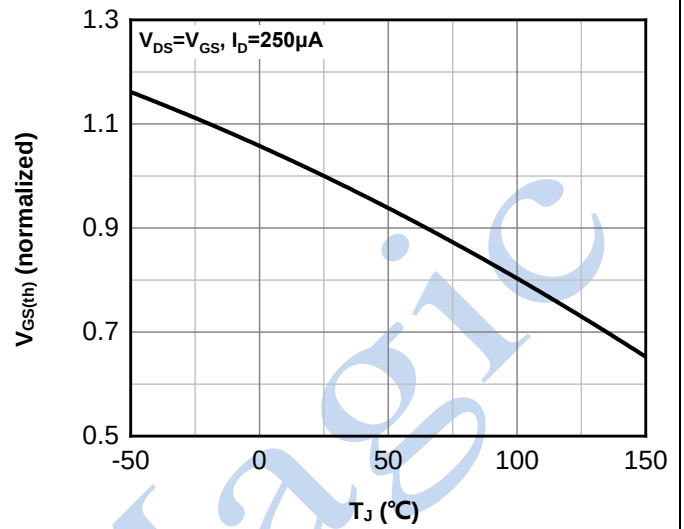
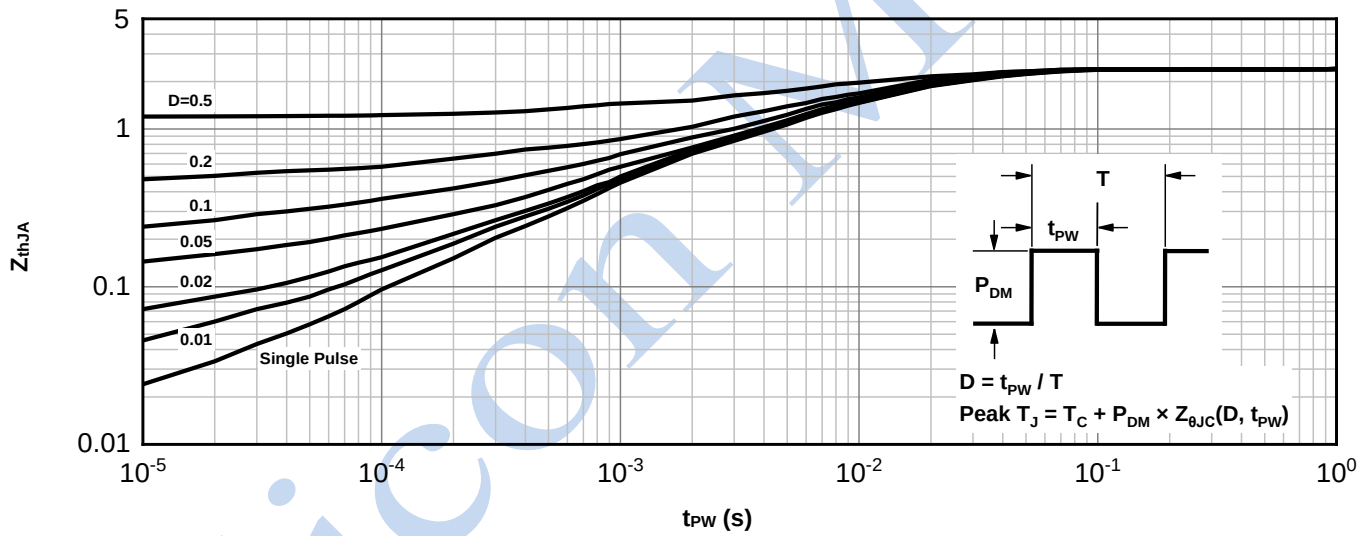
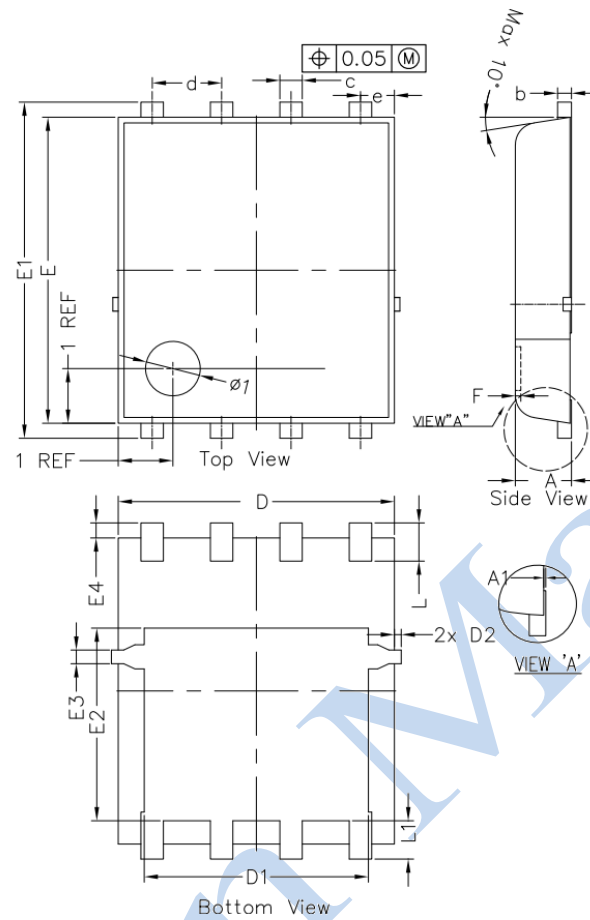
Fig.7 Typ. forward characteristics of body diode

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 $V_{(BR)DSS}$ 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	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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