

N-Channel 100V MOSFET

Product summary

V_{DS} (V)	$R_{DS(on),max}$ (m Ω)	$R_{DS(on),typ}$ (m Ω)	I_D (A)
100	3.9 @ $V_{GS} = 10V$	3.3 @ $V_{GS} = 10V$	120 ⁽¹⁾

Features

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

Applications

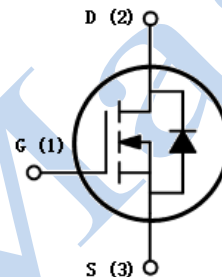
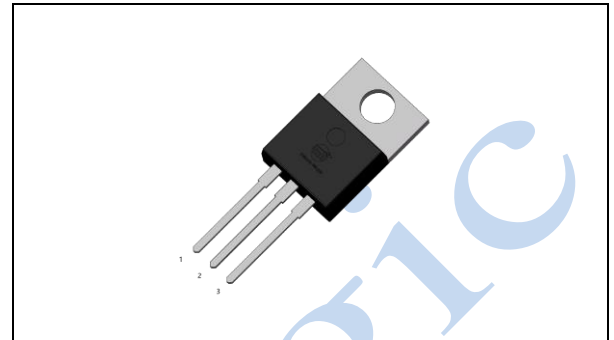
- DC/DC conversion
- Power switch
- Motor drives

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Package and ordering information

Ordering code	Package	Device code
SDN10N3P9A-AA	TO220-3L	N10N3P9A-AA

TO220-3L



RoHS
COMPLIANT
HALOGEN
FREE



XXXXXXXX-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}	100	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current	$T_C = 25^\circ\text{C}$ ⁽¹⁾	I_D	120	A
	$T_C = 100^\circ\text{C}$		107	
	$T_A = 25^\circ\text{C}$ ⁽⁴⁾		20	
Pulsed drain current ⁽²⁾		$I_{D,pulse}$	480	
Avalanche energy, single pulse ⁽³⁾		E_{AS}	800	mJ
Power dissipation	$T_C = 25^\circ\text{C}$	P_D	215	W
	$T_A = 25^\circ\text{C}$ ⁽⁴⁾		3.1	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

2. Thermal resistance ratings

Thermal resistance ratings						
Parameter		Symbol	Max.	Unit		
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	0.58			°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, I _D = 250 μA	100			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.2	3	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 = 50 A		3.3	3.9	mΩ
Forward transconductance ⁽⁵⁾	g _{fs}	V _{DS} = 5 V, I _D = 50 A		113		S
Gate resistance	R _g	f = 1 MHz		1.5		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = 50 V, I _D = 50 A, V _{GS} = 10 V		130		nC
Gate-source charge	Q _{gs}			35		
Gate-drain charge	Q _{gd}			40		
Turn-on delay time	t _{d(on)}	V _{DS} = 50 V, I _D = 50 A, V _{GS} = 10 V, R _{GEN} = 6 Ω		50		ns
Rise time	t _r			74		
Turn-off delay time	t _{d(off)}			97		
Fall time	t _f			30		
Input capacitance	C _{iss}	V _{DS} = 50 V, V _{GS} = 0 V, f = 1 MHz		7470		pF
Output capacitance	C _{oss}			930		
Reverse transfer capacitance	C _{rss}			50		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 50 A		0.9	1.2	V
Reverse recovery time	t _{rr}	V _{DS} = 50 V, I _F = 50 A, di/dt = 100 A/μs		70		ns
Reverse recovery charge	Q _{rr}			147		nC

Notes

- (1) Package limited.
- (2) Pulse width limited by maximum junction temperature.
- (3) $V_{DS} = 50 \text{ V}, V_{GS} = 10 \text{ V}, L = 0.3 \text{ mH}$.
- (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

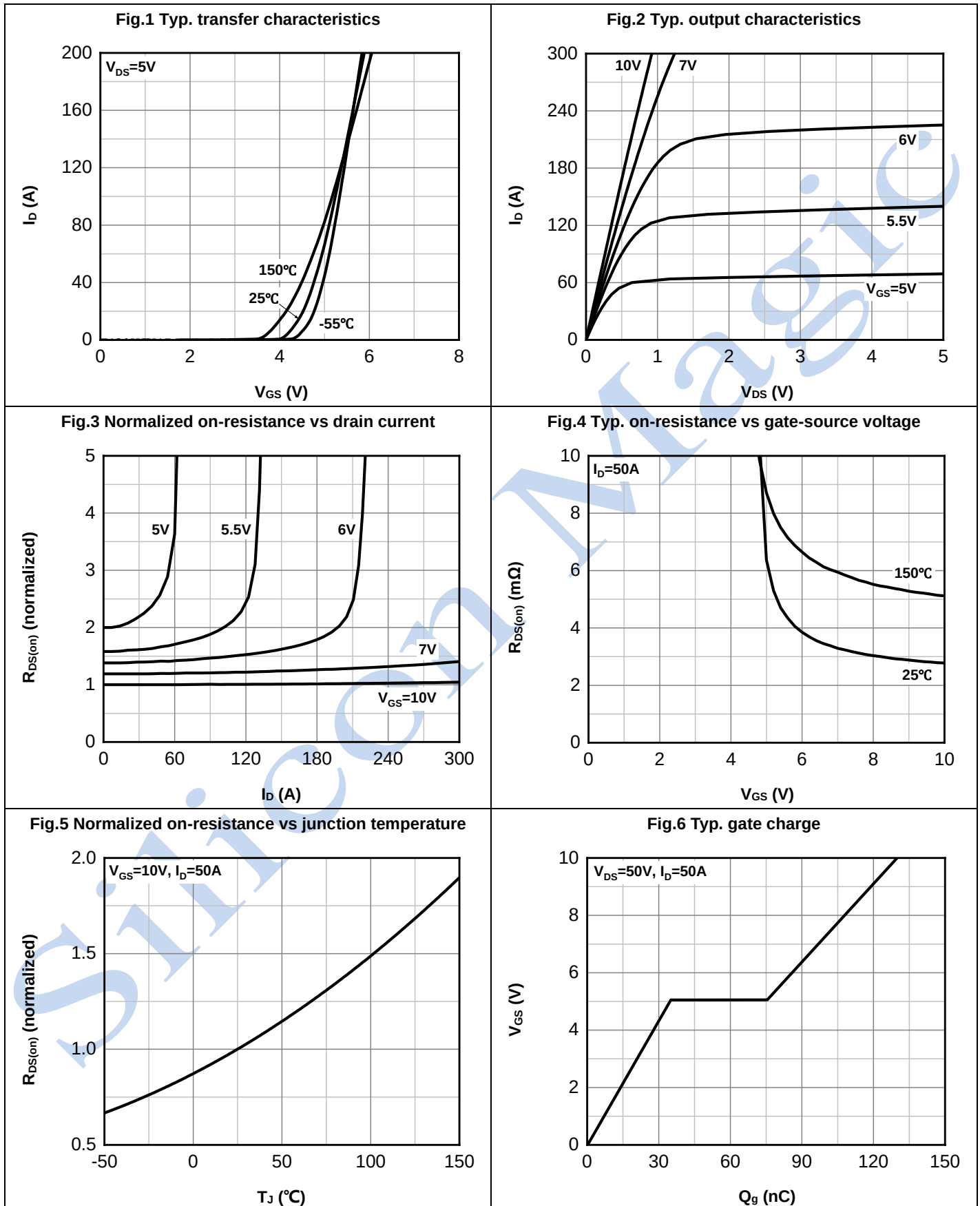


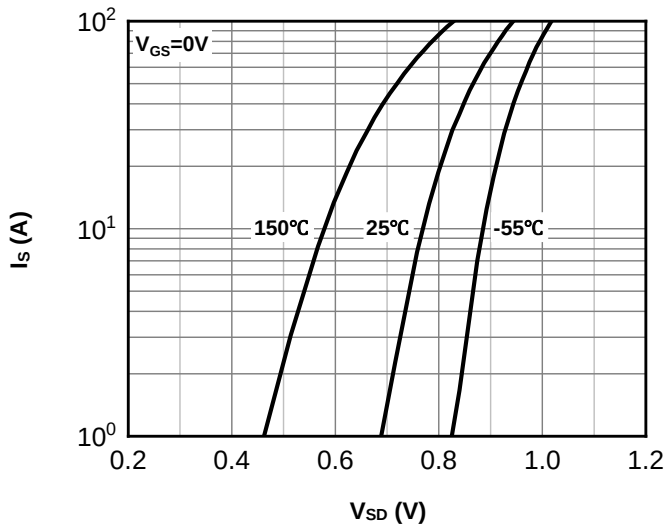
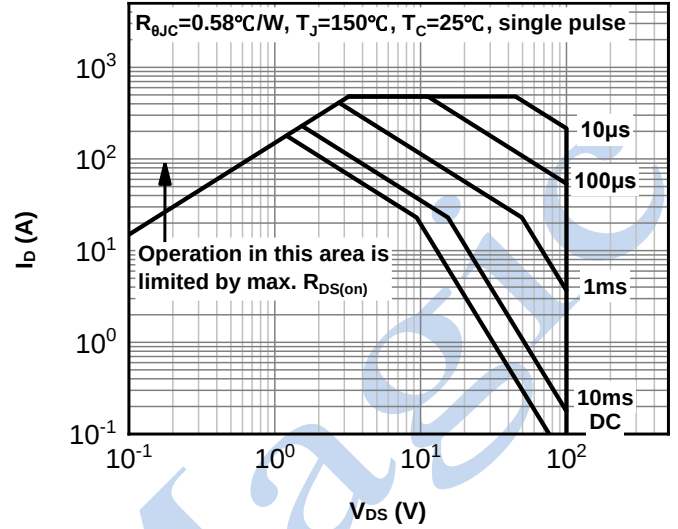
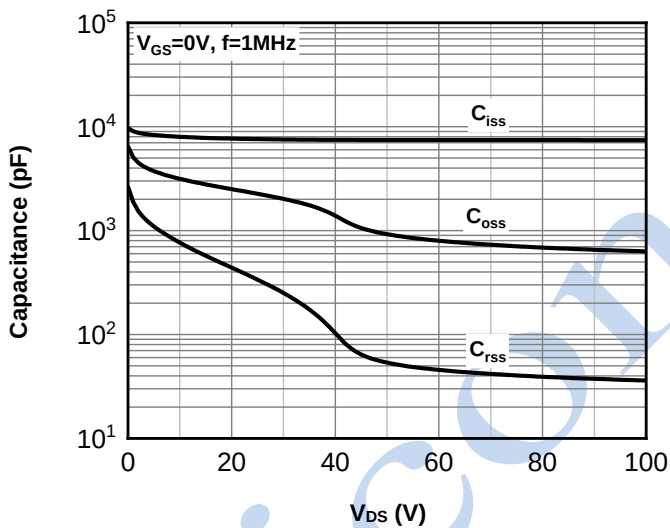
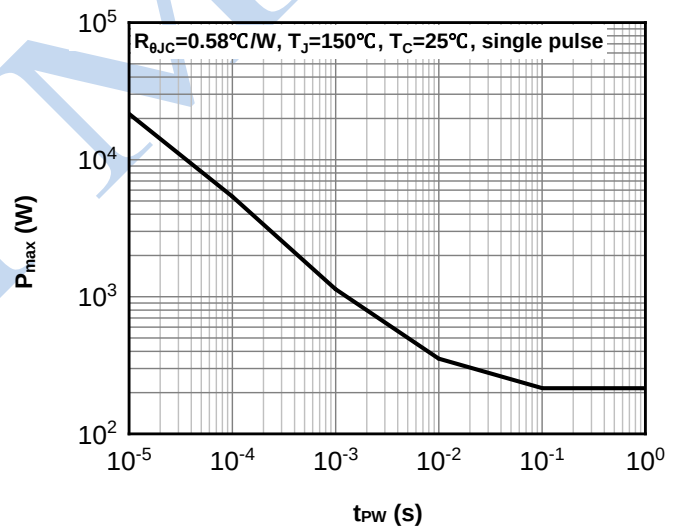
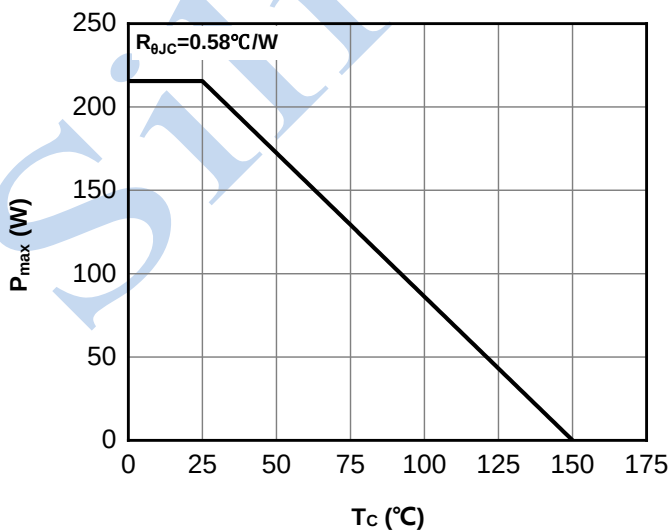
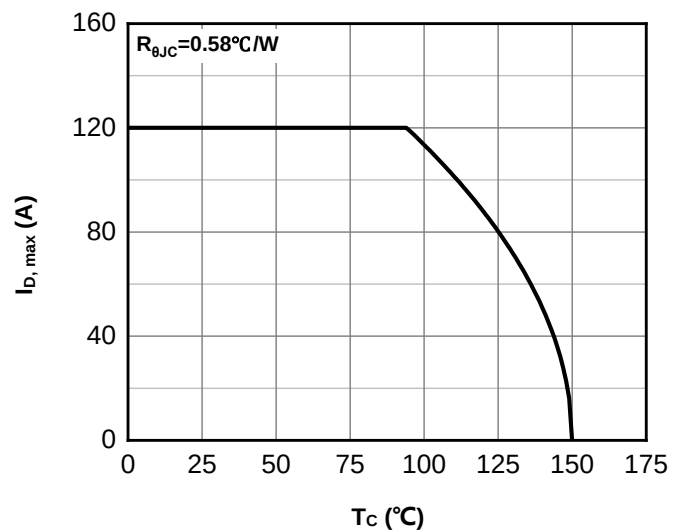
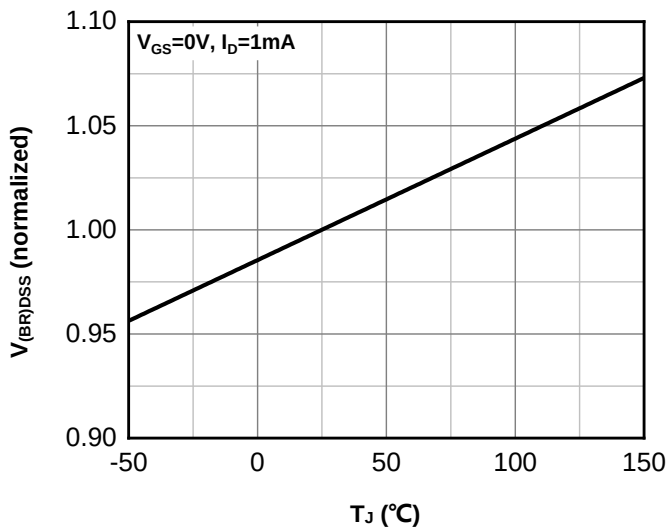
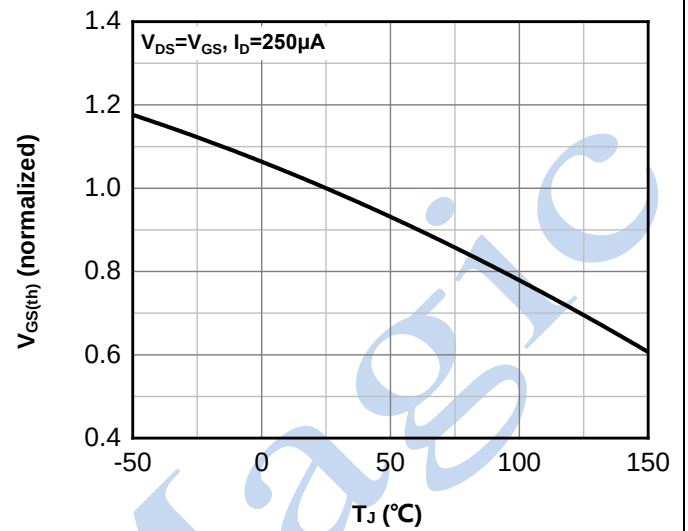
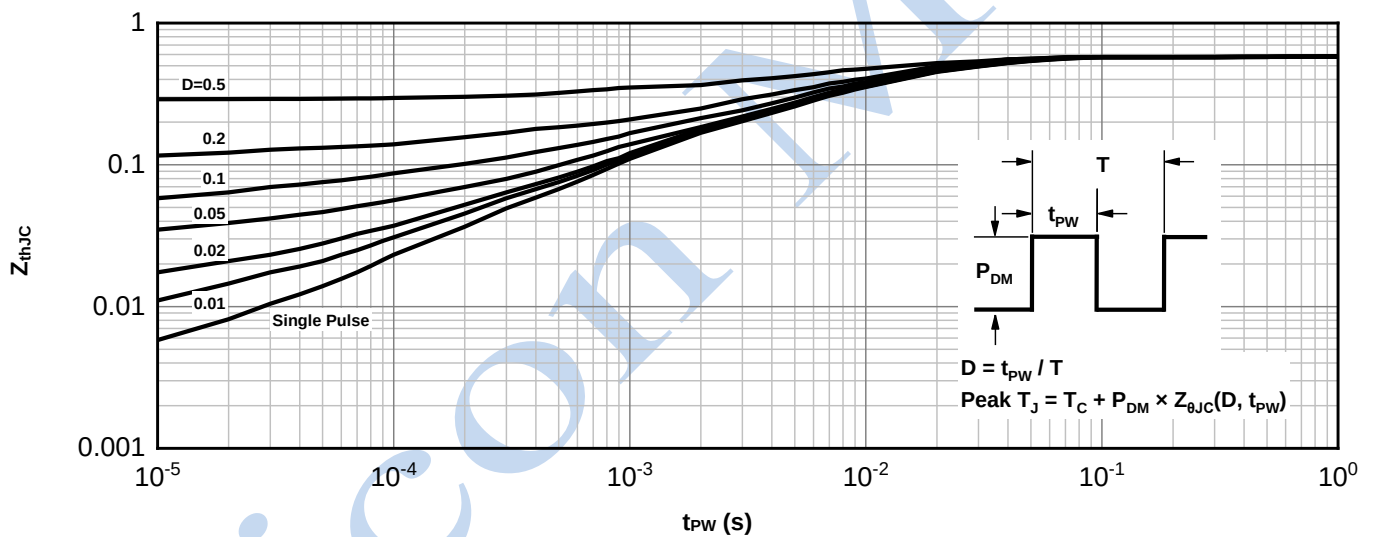
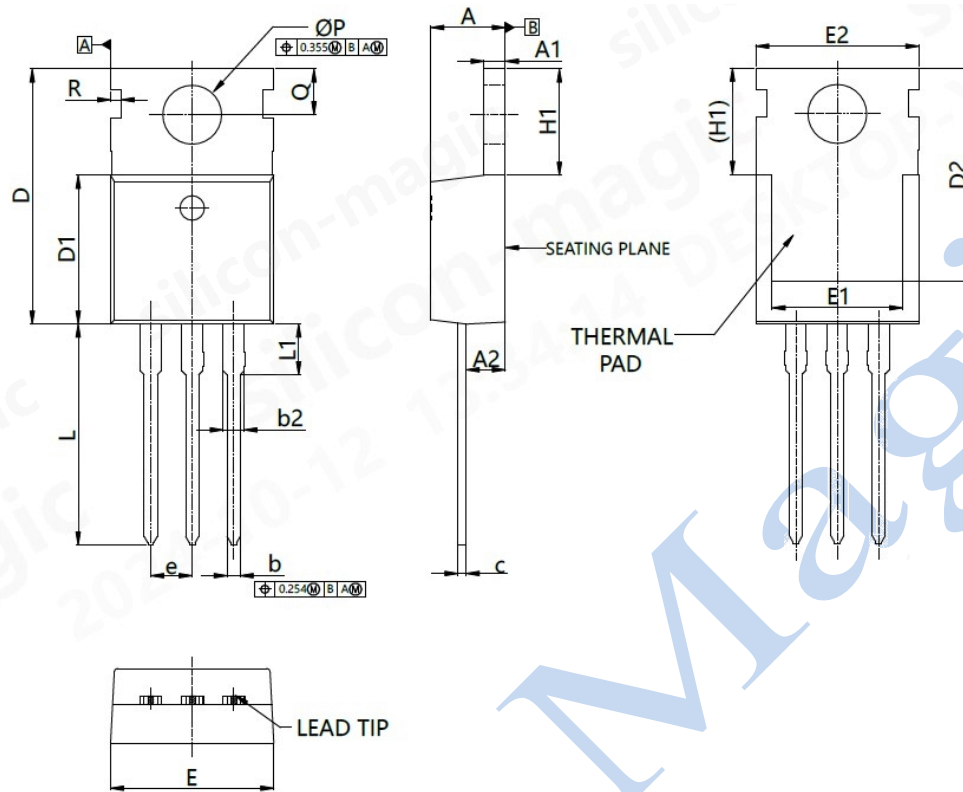
Fig.7 Typ. forward characteristics of body diode

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	4.35	4.57	4.75
A1	1.20	1.30	1.45
A2	2.20	2.40	2.60
b	0.70	0.80	0.90
b2	1.17	1.37	1.52
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.80	9.20	9.40
D2	12.00	13.00	13.50
E	9.80	10.00	10.20
E1	7.00	8.00	8.46
E2	9.70	10.00	10.30
e	2.44	2.54	2.64
H1	6.25	6.50	6.85
L	12.80	13.50	13.80
L1	2.75	3.45	3.95
P	3.40	3.60	3.80
Q	2.60	2.85	3.10
R	0.50	0.65	0.80

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