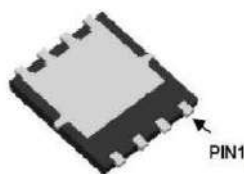


Features

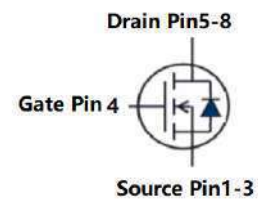
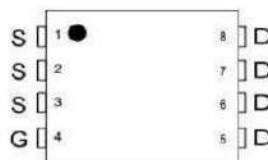
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested
- Low RDS(on) trench technology

Application

- DC/DC conversion
- Power switch
- Motor drives



PDFN5*6-8



N-Channel

Product Summary



V_{DS}	30	V
$R_{DS(on),typ} @ V_{GS}=10V$	1.4	mΩ
I_D	167	A

1. Maximum ratings

Absolute Maximum Ratings(at $T_a = 25^\circ\text{C}$ unless otherwise specified)				
Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	30	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current	$T_C=25^\circ\text{C}^{(1)}$	I_D	167	A
	$T_C=100^\circ\text{C}$		105	
	$T_A=25^\circ\text{C}^{(4)}$		30	
Pulsed drain current ⁽²⁾		$I_{D,pulse}$	668	
Avalanche energy, single pulse ⁽³⁾		E_{AS}	360	mJ
Power dissipation	$T_C=25^\circ\text{C}$	P_D	83.3	W
	$T_A=25^\circ\text{C}^{(4)}$		2.7	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

2. Thermal resistance ratings

Thermal resistance ratings				
Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	1.5	$^\circ\text{C/W}$
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 V, I _D = 250 μA	30			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0	1.6	2.5	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} = 30 V, V _{GS} = 0 V			1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A		1.4	1.7	mΩ
		V _{GS} = 4.5 V, I _D = 15 A		1.9	2.3	
Forward transconductance ⁽⁵⁾	g _{fs}	V _{DS} = 5 V, I _D = 30 A		150		S
Gate resistance	R _g	f = 1 MHz		2		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = 15 V, I _D = 30 A, V _{GS} = 4.5 V		18		nC
Total gate charge	Q _g	V _{DS} = 15 V, I _D = 30 A, V _{GS} = 10 V		38		
Gate-source charge	Q _{gs}			8		
Gate-drain charge	Q _{gd}			4.5		
Turn-on delay time	t _{d(on)}	V _{DS} = 15 V, I _D = 30 A, V _{GS} = 10 V, R _{GEN} = 1.6 Ω		16		ns
Rise time	t _r			44		
Turn-off delay time	t _{d(off)}			25		
Fall time	t _f			7		
Input capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz		2492		pF
Output capacitance	C _{oss}			1730		
Reverse transfer capacitance	C _{rss}			34		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 20 A		0.7	1.3	V
Reverse recovery time	t _{rr}	V _{DS} = 15 V, I _F = 30 A, di/dt = 100 A/μs		85		ns
Reverse recovery charge	Q _{rr}			78		nC

Notes

- (1) Limited by maximum junction temperature.
- (2) Pulse width limited by maximum junction temperature.
- (3) $V_{DS} = 15\text{ V}$, $V_{GS} = 10\text{ V}$, $L = 0.3\text{ mH}$.
- (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.1 Typ. transfer characteristics

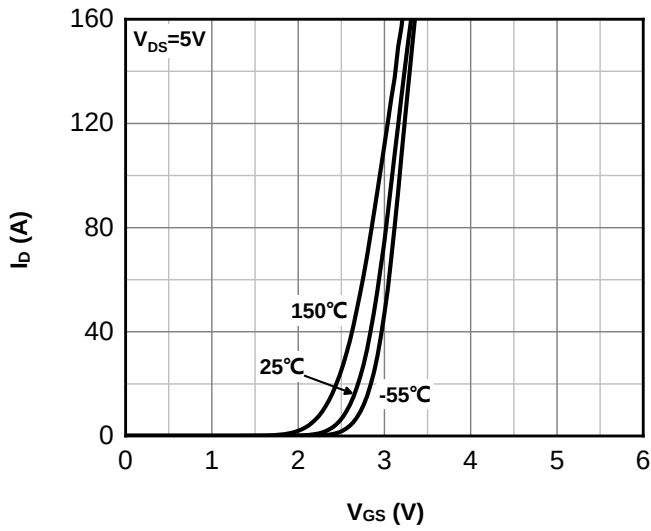


Fig.2 Typ. output characteristics

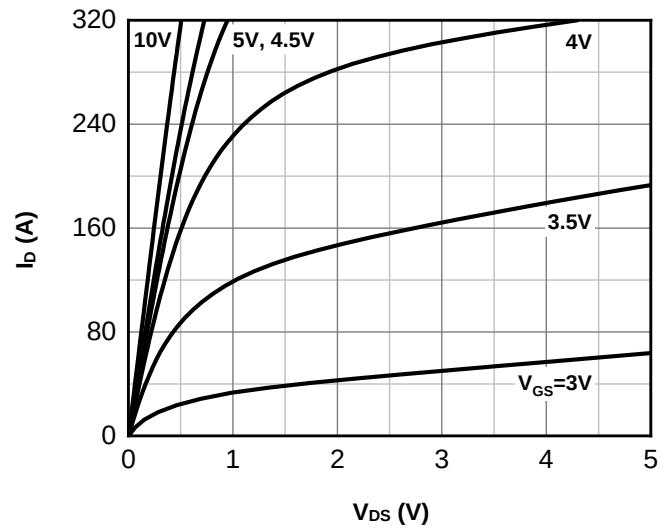


Fig.3 Normalized on-resistance vs drain current

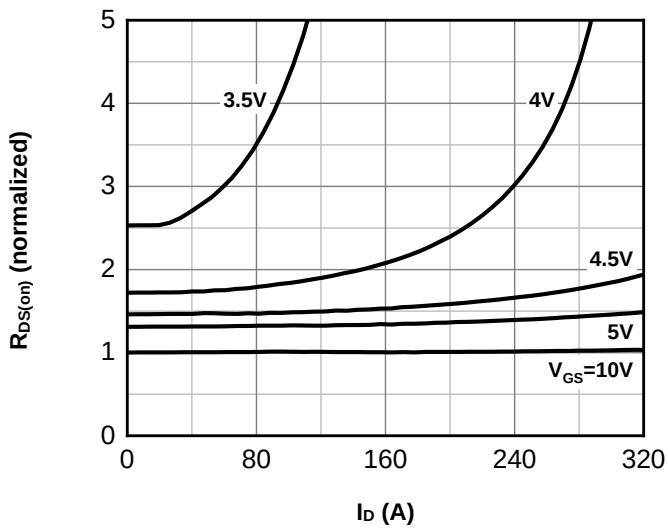


Fig.4 Typ. on-resistance vs gate-source voltage

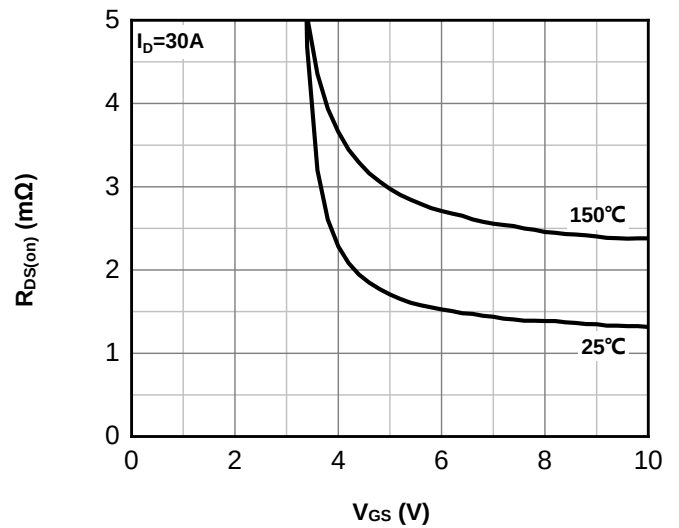


Fig.5 Normalized on-resistance vs junction temperature

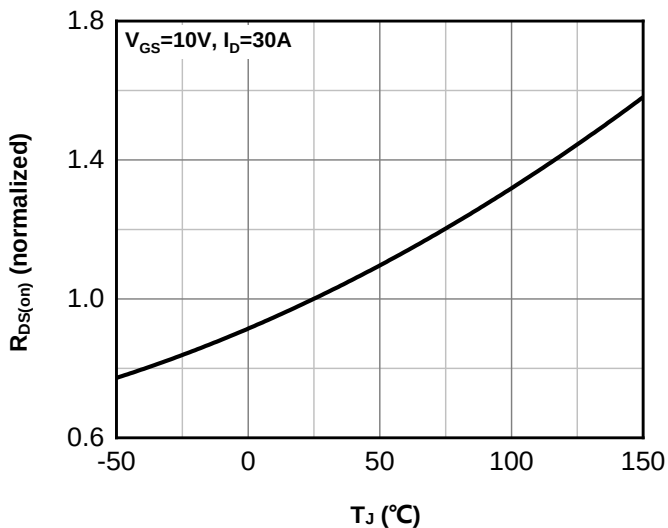


Fig.6 Typ. gate charge

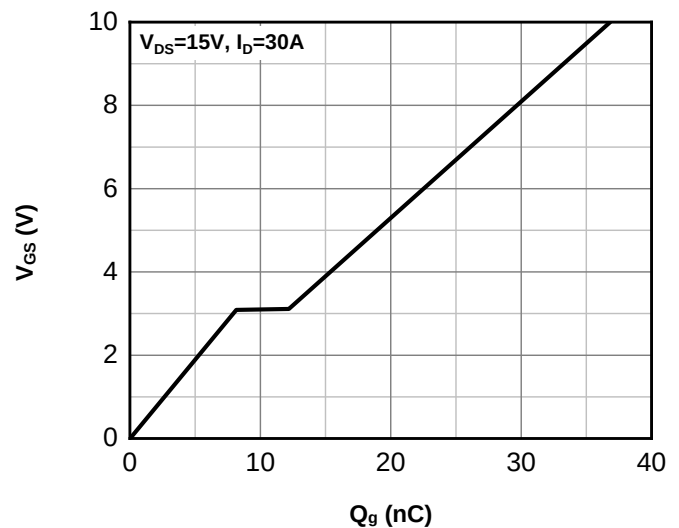


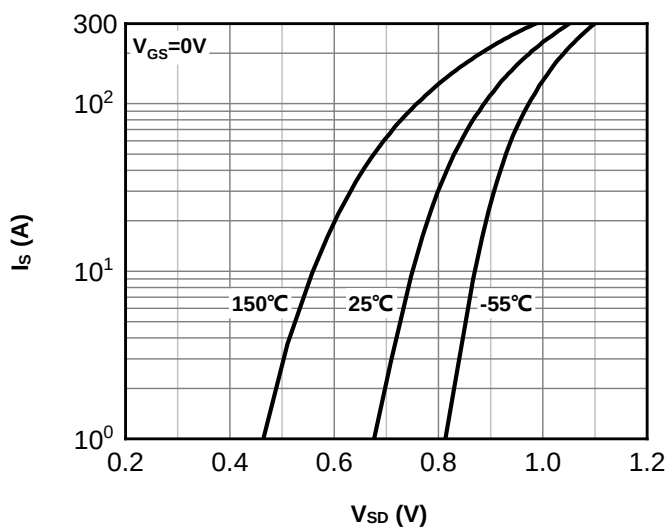
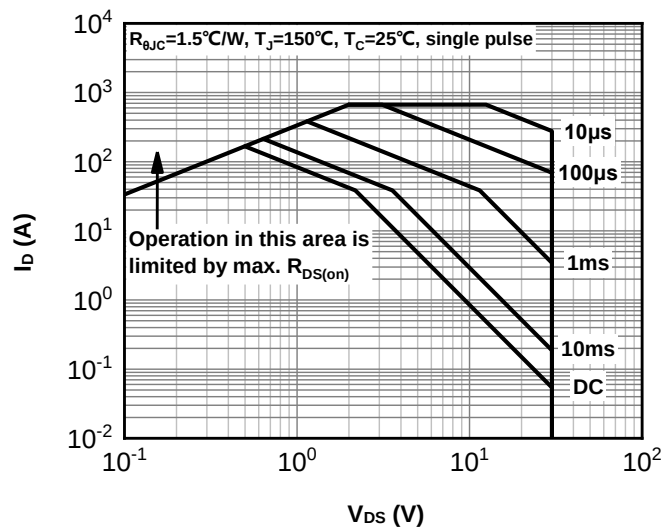
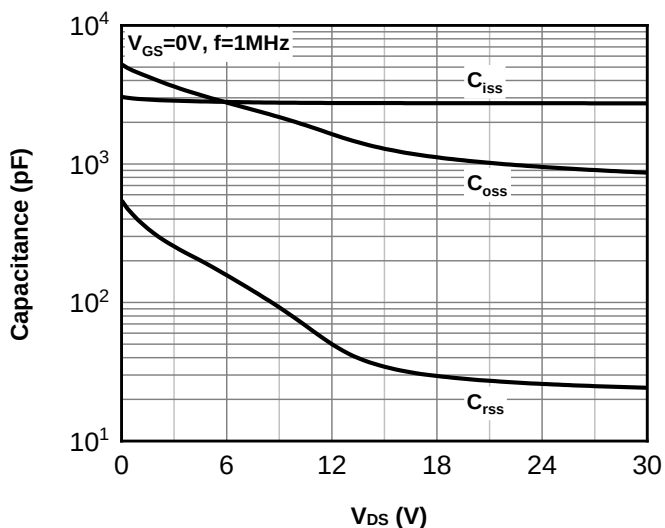
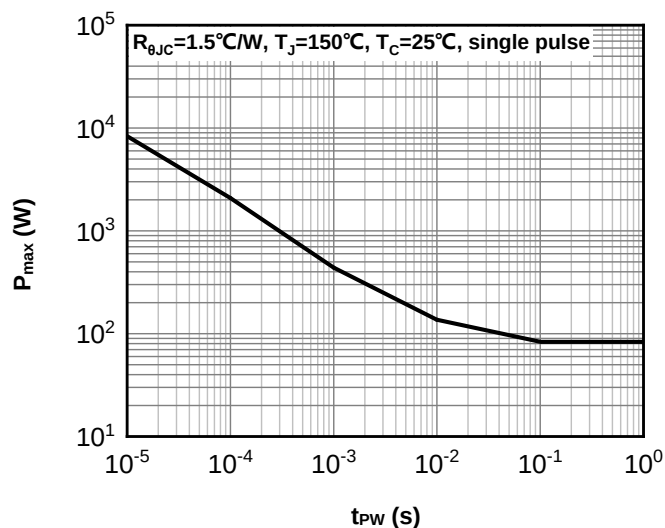
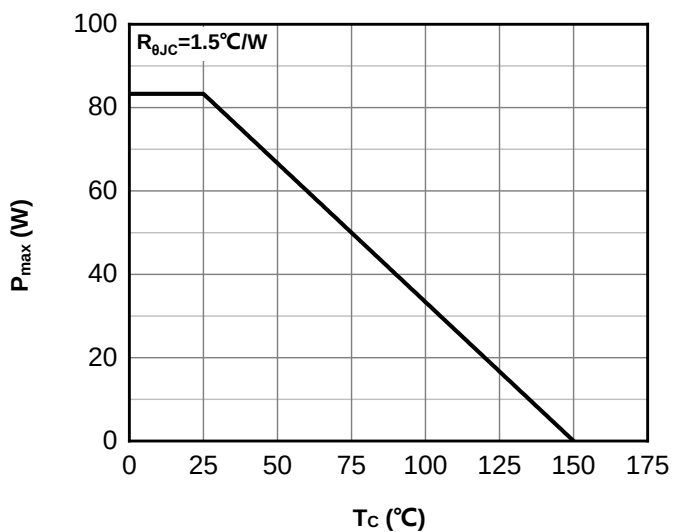
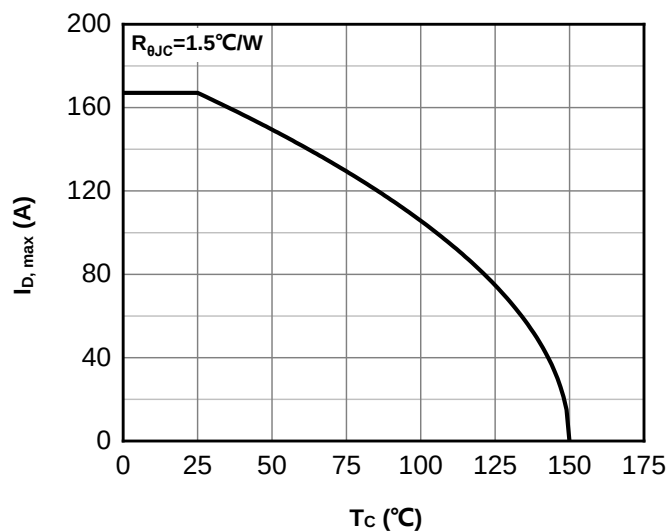
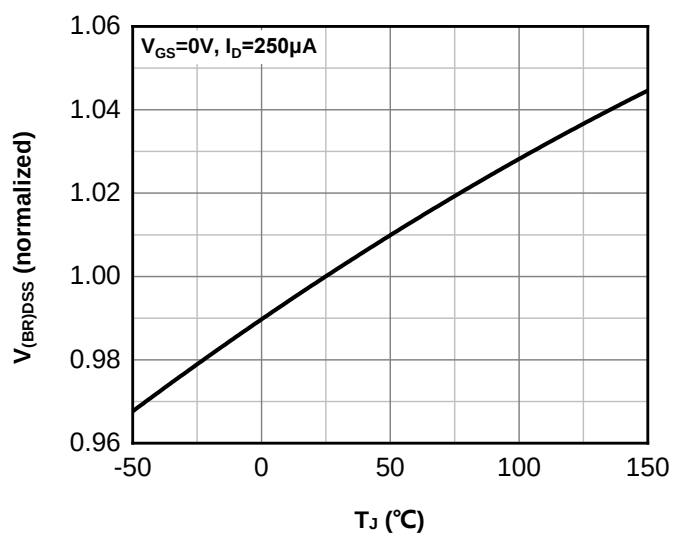
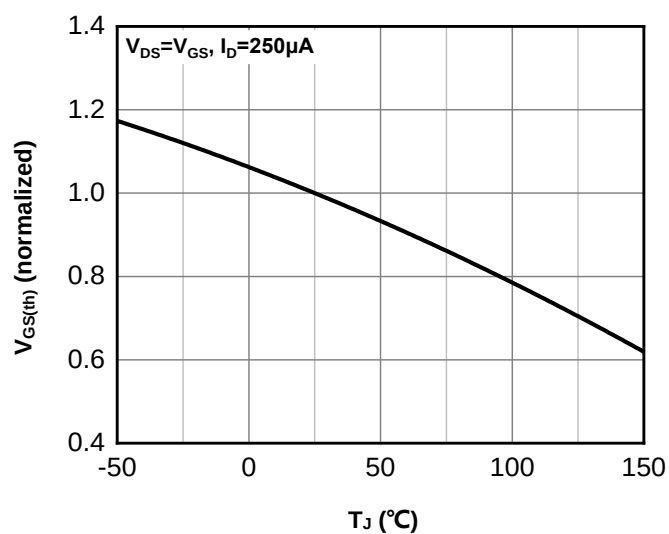
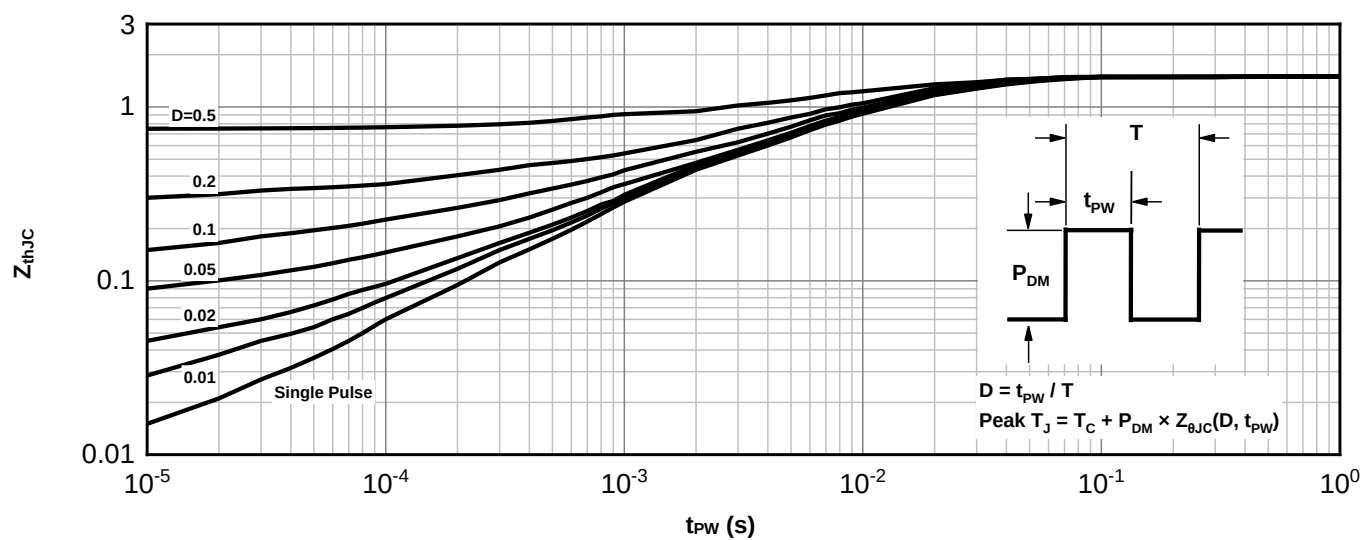
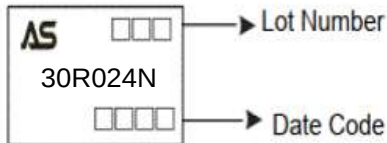
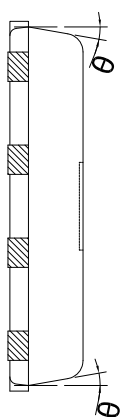
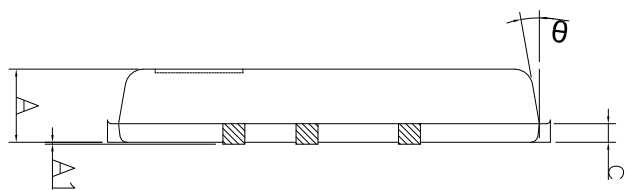
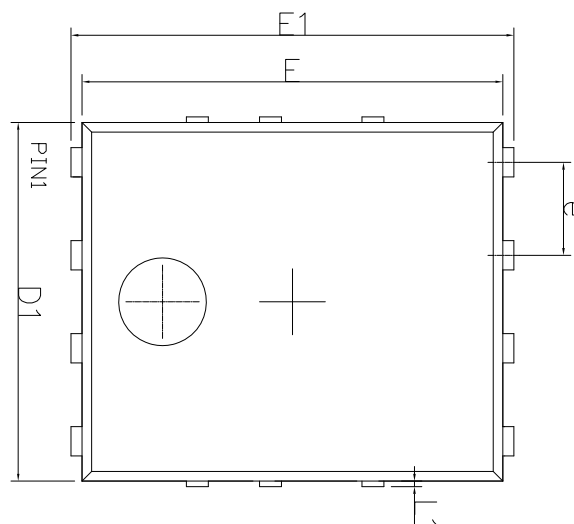
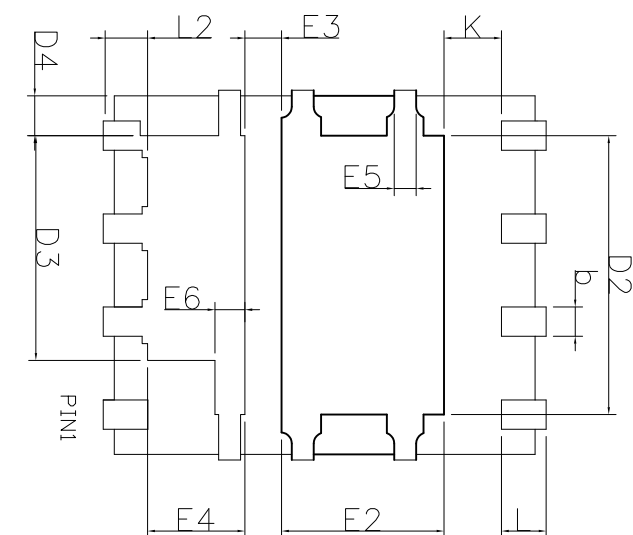
Fig.7 Typ. forward characteristics of body diode

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


Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM30R024NQ-R	30R024N	PDFN5*6-8	Tape&Reel	4000/Reel

PACKAGE	MARKING
PDFN5*6-8	 AS □□□□ → Lot Number 30R024N □□□□ → Date Code

PDFN5x6_P, 8 Leads


DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.00	/	0.05
b	0.33	0.40	0.51
c	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
D3	2.87	3.07	3.22
D4	0.445	0.545	0.645
E	5.70	5.75	5.80
E1	5.90	6.05	6.15
E2	2.02	2.22	2.32
E3	0.40	0.50	0.60
E4	1.22	1.32	1.42
E5	0.20	/	0.40
E6	0.31	/	0.51
e	1.27 BSC		
L	0.51	0.58	0.71
L1	0.00	/	0.20
L2	0.48	0.58	0.68
K	0.50	0.75	1.00
θ	0	10°	12°

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