

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	11mΩ@10V	30A
	17mΩ@4.5V	

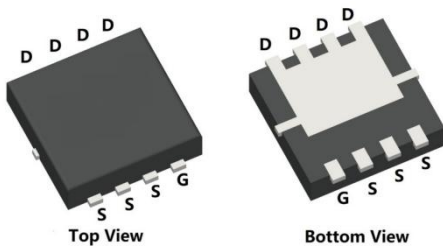
Feature

- Low $R_{DS(ON)}$
- Low gate charge
- Suffix "-Q1" for AEC-Q101

Application

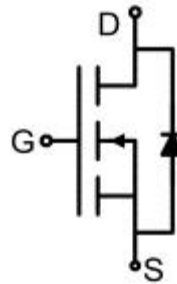
- Motor/Body load control
- Load switch
- DC-DC converter and off-line UPS

Package

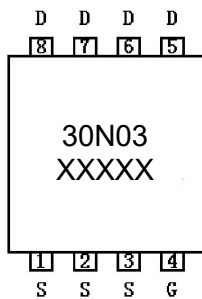


PDFN3*3-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^\circ\text{C}$)	I_D	30	A
Continuous Drain Current ($T_C=100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	19	A
Pulsed Drain Current ¹⁾	I_{DM}	120	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	22	mJ
Power Dissipation($T_C=25^\circ\text{C}$)	P_D	19	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	6.5	$^\circ\text{C/W}$
Operating Junction Temperature	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Electrical characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	30			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.2	1.4	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=7\text{A}$		7	11	m Ω
		$V_{GS}=4.5\text{V}, I_D=6\text{A}$			17	
Dynamic characteristics³⁾						
Input Capacitance	C_{iss}	$V_{DS}=15\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		1020		pF
Output Capacitance	C_{oss}			116		
Reverse Transfer Capacitance	C_{rss}			72		
Total Gate Charge	Q_g	$V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=7\text{A}$		19		nC
Gate-Source Charge	Q_{gs}			3.5		
Gate-Drain Charge	Q_{gd}			3		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=7\text{A}$ $R_G=3.3\Omega$		10		nS
Turn-on rise time	t_r			21		
Turn-off delay time	$t_{d(off)}$			10		
Turn-off fall time	t_f			2		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				30	A
Diode Forward voltage	V_{SD}	$V_{GS}=0\text{V}, I_S=1\text{A}$			1.3	V
Reverse Recovery Time	T_{rr}	$I_S=7\text{A}, di/dt=-100\text{A}/\mu\text{s}$		8		nS
Reverse Recovery Charge	Q_{rr}			3		nC

Notes:

- 1) Pulse Test: Pulse Width $\leq 100\mu\text{s}$, Duty Cycle $\leq 2\%$, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$.
- 2) Limited by $T_{J(MAX)}$, starting $T_J=25^\circ\text{C}$, $L=0.1\text{mH}$, $R_G=25\Omega$, $I_D=21\text{A}$, $V_{GS}=10\text{V}$.
- 3) Guaranteed by design, not subject to production.

Typical Characteristics

Fig. 1 Typical Output Characteristics

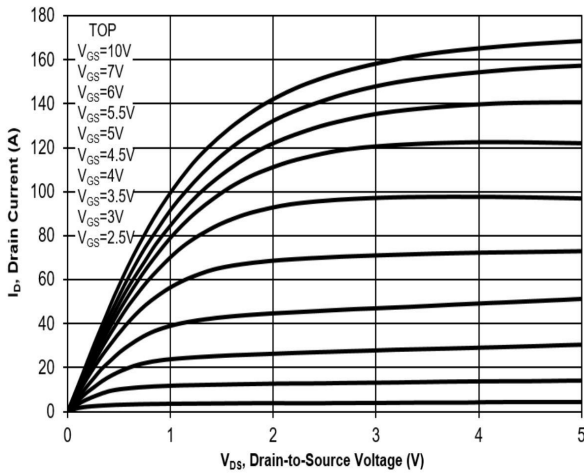


Fig. 2 Typical Transfer Characteristics

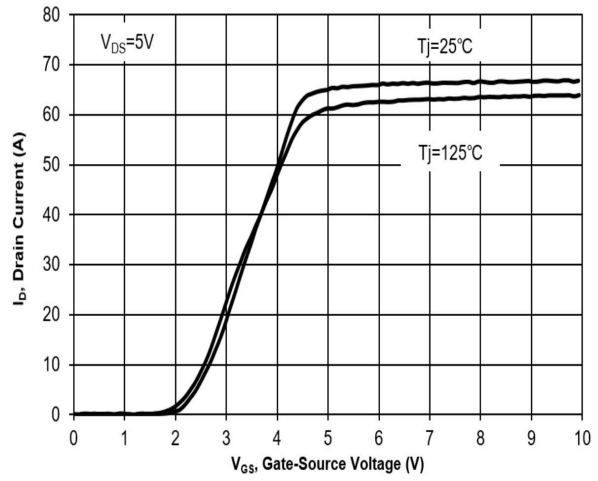


Fig. 3 On-Resistance vs. Drain Current

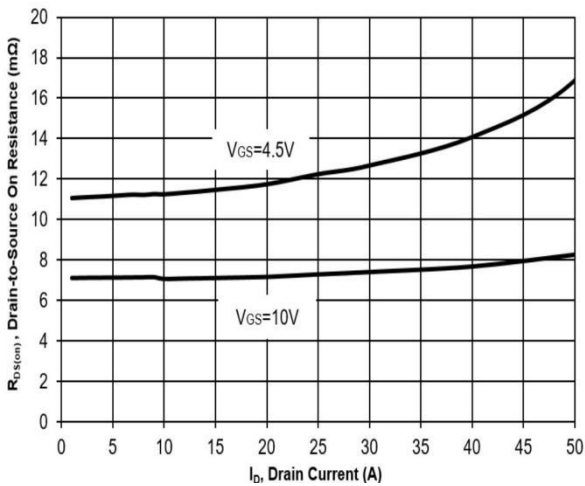


Fig. 4 On-Resistance vs. Gate to Source Voltage

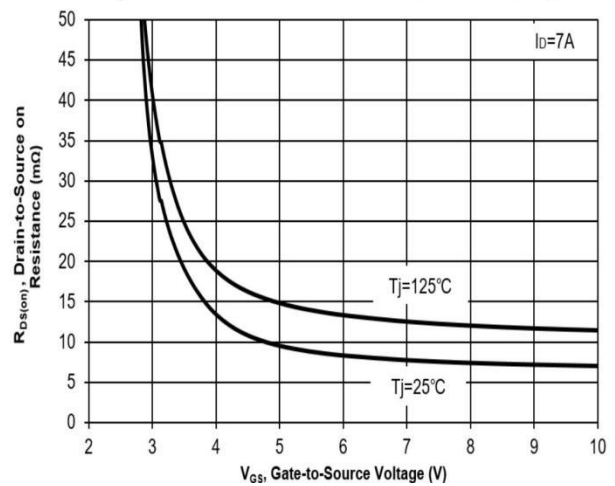


Fig. 5 On-Resistance vs. T_j

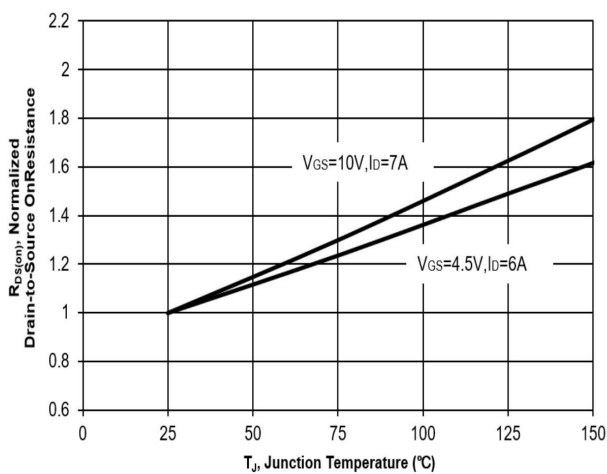
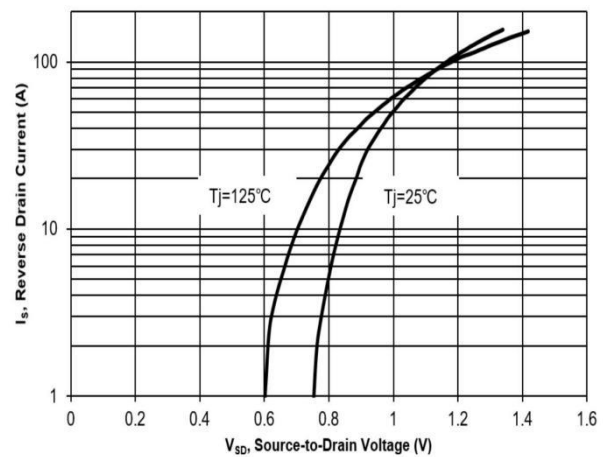


Fig. 6 Typical Body Diode Forward Characteristics



Typical Characteristics

Fig. 7 Typical Junction Capacitance

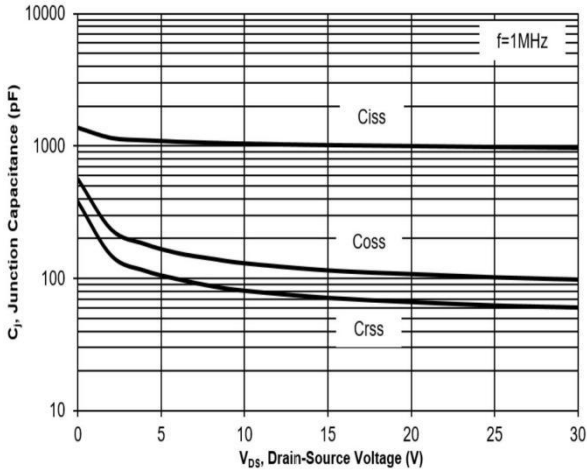


Fig. 8 Drain-Source Leakage Current vs. T_j

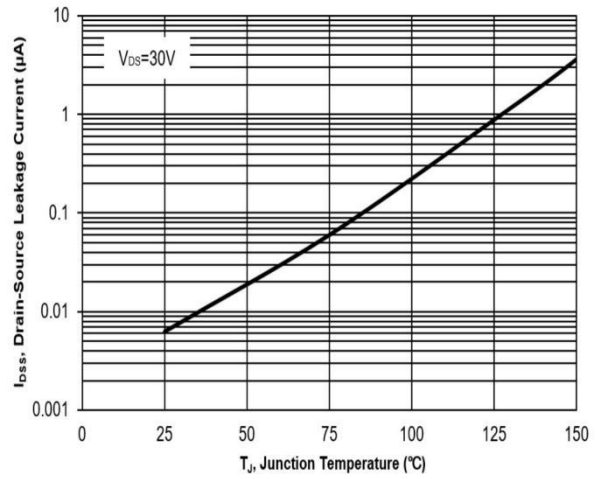


Fig. 9 $V_{(BR)DSS}$ vs. Junction Temperature

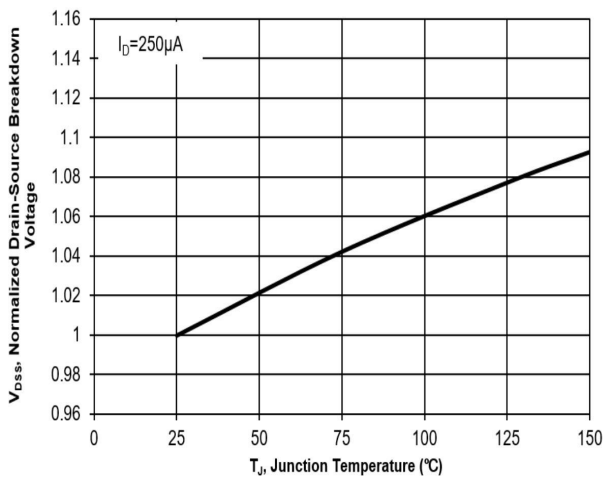


Fig. 10 Gate Threshold Variation vs. T_j

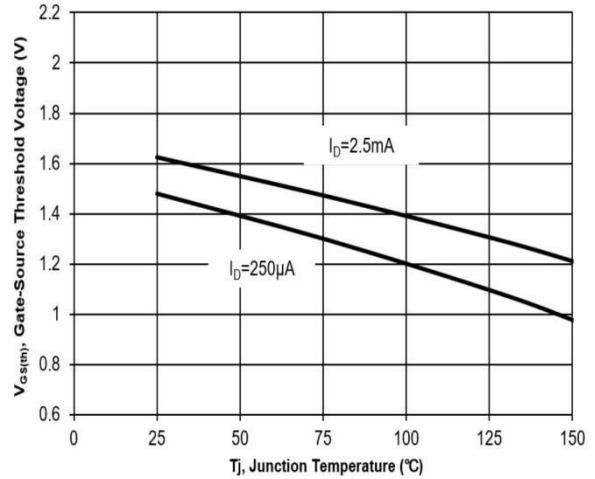


Fig. 11 Gate Charge

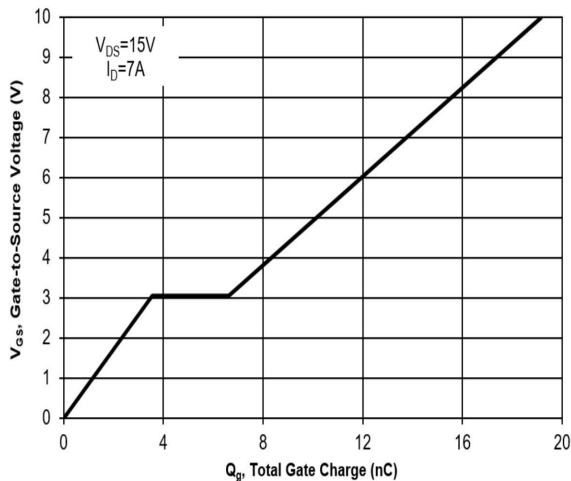
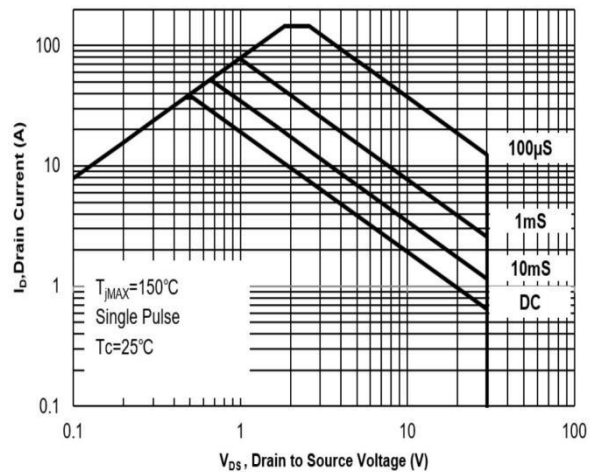


Fig. 12 Safe Operation Area



Typical Characteristics

Fig. 13 Normalized Maximum Transient Thermal Impedance($Z_{\theta JC}$)

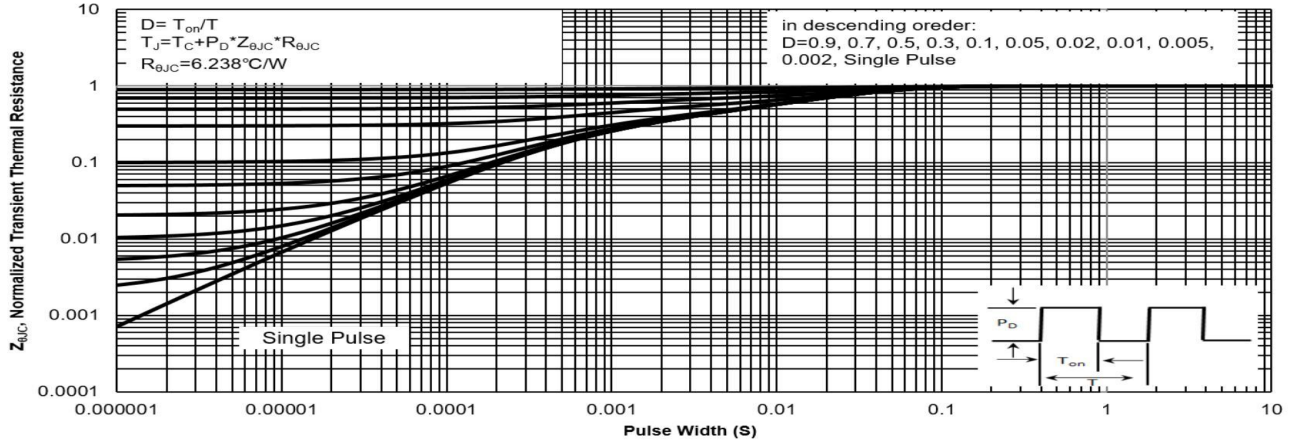
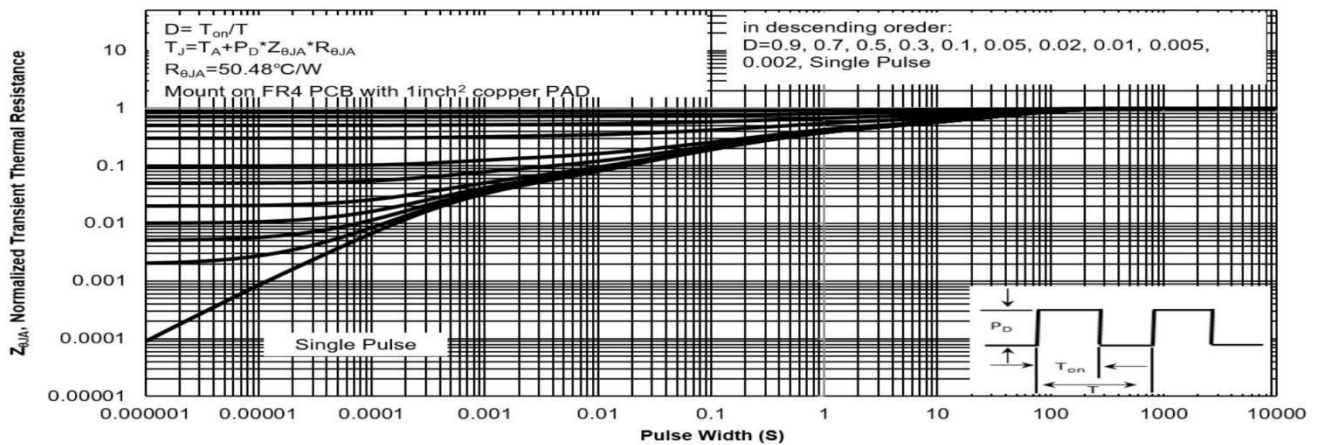
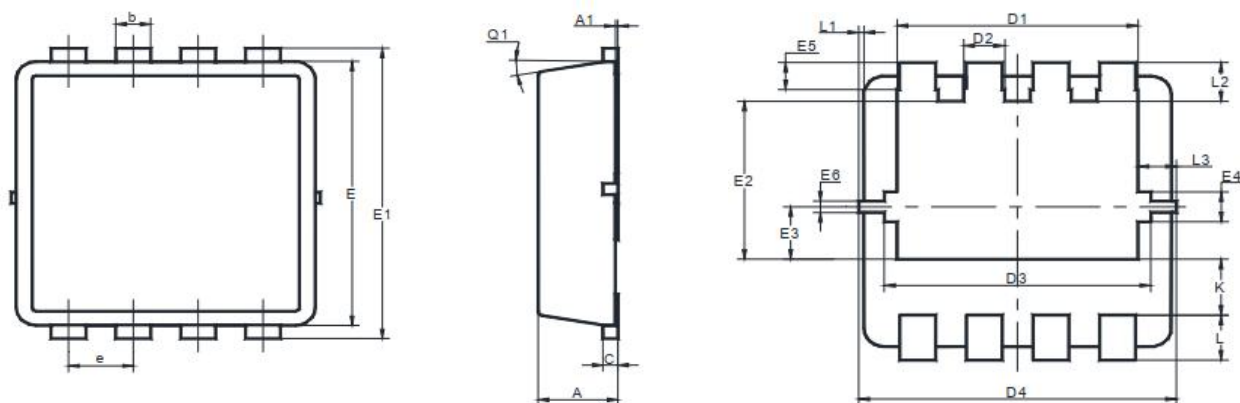


Fig. 14 Normalized Maximum Transient Thermal Impedance($Z_{\theta JA}$)



PDFN3*3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.050	0.000	0.002
b	0.240	0.350	0.009	0.014
c	0.100	0.250	0.004	0.010
D1	2.400	2.600	0.094	0.102
D2	0.300	0.500	0.012	0.020
D3	2.500	2.700	0.098	0.106
D4	3.000	3.200	0.118	0.126
E	2.900	3.100	0.114	0.122
E1	3.100	3.300	0.122	0.130
E2	1.650	1.850	0.065	0.073
E3	0.480	0.680	0.019	0.027
E4	0.230	0.430	0.009	0.017
E5	0.200	0.400	0.008	0.016
E6	0.150	0.250	0.006	0.010
e	0.600	0.700	0.024	0.028
K	0.520	0.720	0.020	0.028
L	0.300	0.500	0.012	0.020
L1	0.000	0.100	0.000	0.004
L2	0.330	0.530	0.013	0.021
L3	0.275	0.475	0.011	0.019
θ1	0°	12°	0°	12°