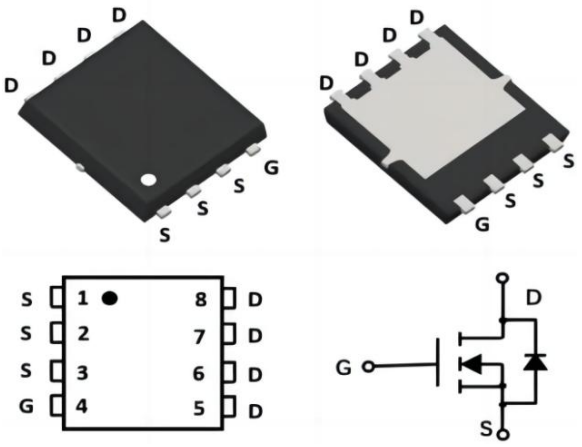
SKQ90N10AD

N-Channel Enhancement Mode MOSFET

BV_{DSS},T_A=25℃	$R_{DS(ON)}$,typ@10V	I_D,T_A=25℃
100	5mΩ	90A

Features

- $R_{DS(ON)}$@10V<7.5mΩ(Typ. 5mΩ)
- I_D = 90A
- Fast Switching Speed
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested



PDFN5x6-8L

Applications

- Power Management in DC/DC Converters
- USB Power Delivery(USB PD)

Absolute Maximum Ratings(T_J=25℃,unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current	T_C=25℃	I_D	90	A
	T_C=100℃		62	
Pulse Drain Current Tested	T_C=25℃	I_{DM}	360	A
Maximum Power Dissipation	T_C=25℃	P_D	89	W
	T_C=100℃		36	
Maximum Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55~+150	℃
Avalanche Current, Single Pulse(2)	L=0.1mH	I_{AS}	41	A
Avalanche Energy, Single Pulse(2)	L=0.1mH	E_{AS}	84	mJ

Thermal Characteristics

Parameter	Symbol	Limit	Unit
Thermal Resistance-Junction to Case	$R_{J\theta C}$	1.4	℃/W
Thermal Resistance-Junction to Ambient(3)	$R_{J\theta A}$	50	℃/W

Note(1):Max. Current is limited by binding wire

Note(2):UIS tested and pulse width are limited by maximum junction temperature 150℃

Note(3):Surface Mounted on 1in^2 FR-4 board with 1oz

Electrical Characteristics(T_A=25℃,unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_{DS}=250μA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V,V_{GS}=0V			1	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_{DS}=250μA	2	3	4	V
Gate Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
Drain-Source On-state Resistance(4)	$R_{DS(ON)}$	V_{GS}=10V,I_{DS}=20A		5	7.5	mΩ
Forward Trans conductance	g_{fs}	V_{DS}=5V,I_{DS}=10A		21.8		S
Dynamic Characteristics						
Gate Resistance	R_G	V_{GS}=0V,V_{DS}=0V, f=1MHz		0.5		Ω
Input Capacitance	C_{ISS}	V_{GS}=0V,V_{DS}=50V, f=1MHz		2867		pF
Output Capacitance	C_{OSS}			920		
Reverse Transfer Capacitance	C_{RSS}			57		
Turn-on Delay Time	$t_{d(ON)}$	V_{GS}=10V,V_{DS}=25V, ID=1A,R_G=3Ω		14.3		nS
Turn-on Rise Time	t_r			4.3		
Turn-off Delay Time	$t_{d(OFF)}$			32.1		
Turn-on Fall Time	t_f			90.7		
Total Gate Charge	Q_g	V_{GS}=6V,V_{DS}=50V, I_D=20A		35		nC
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=50V, I_D=20A		53.1		
Gate-Source Charge	Q_{gs}			15.8		
Gate-Drain Charge	Q_{gd}			15.1		
Source-Drain Characteristics						
Diode Forward Voltage(5)	V_{SD}	I_{SD}=2A,V_{GS}=0V		0.7	1.1	V
Reverse Recovery Time	t_{rr}	I_F=10A,V_R=50V, d_{IF}/dt=100A/μs		47.6		nS
Reverse Recovery Charge	Q_{rr}			66.6		nC

Note(4):Pulse test(pulse width≤300us, duty cycle≤2%)

Note(5):Guaranteed by design, not subject to production testing

Typical Characteristics

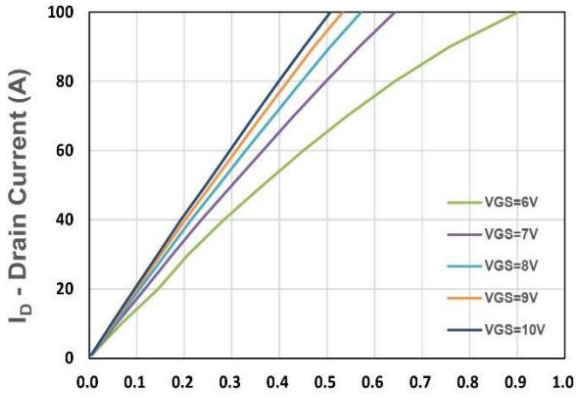


Figure 1. Output Characteristics

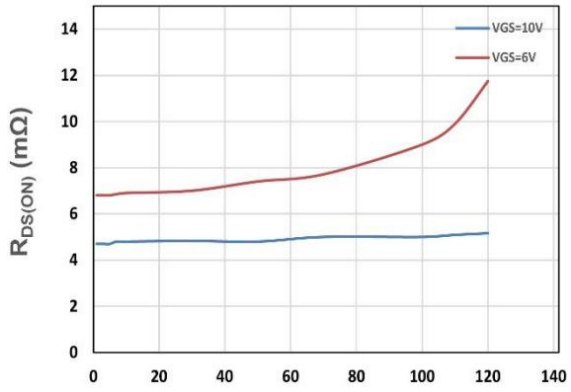


Figure 2. On-Resistance vs. ID

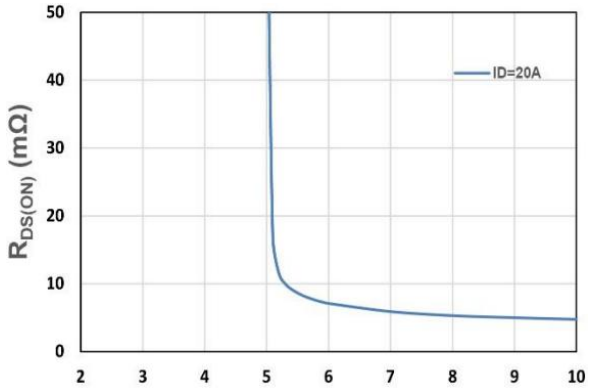


Figure 3. On-Resistance vs. VGS

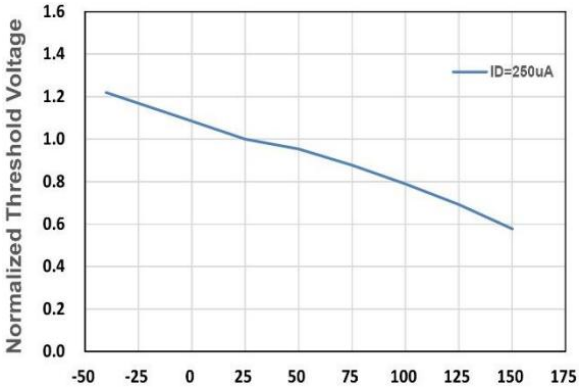


Figure 4. Gate Threshold Voltage

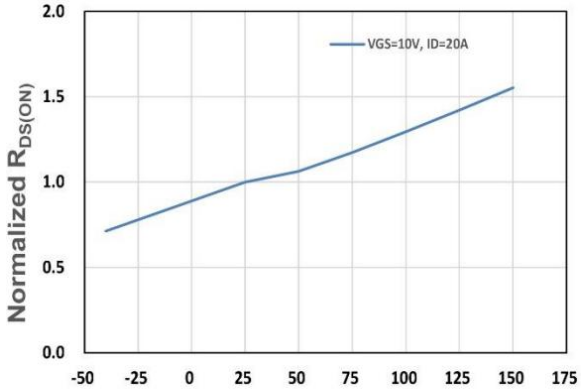


Figure 5. Drain-Source On Resistance

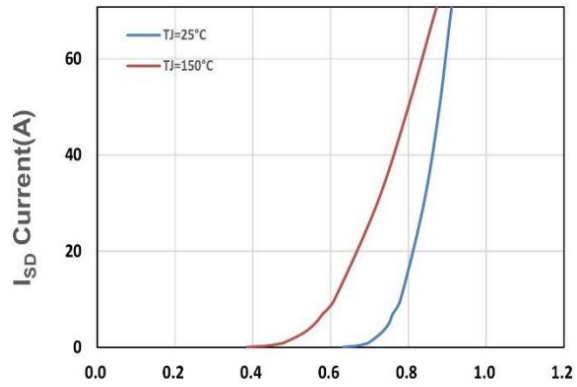
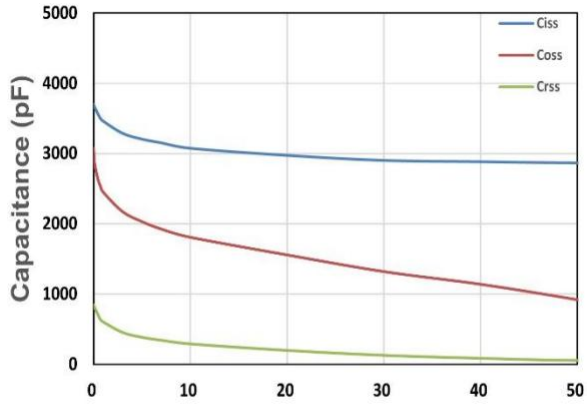
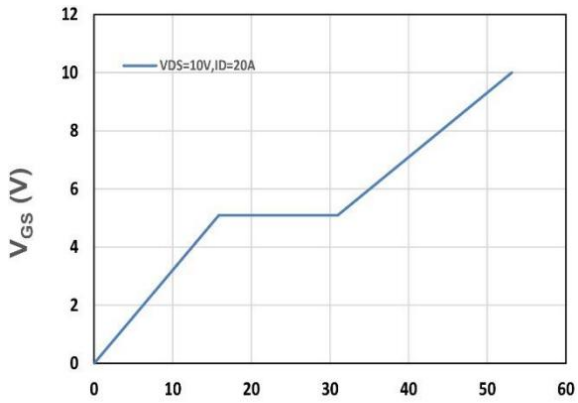


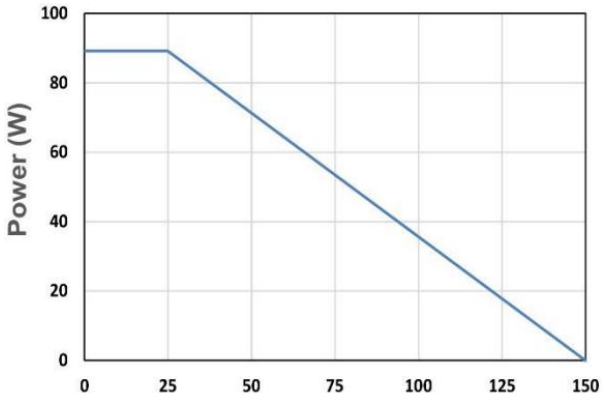
Figure 6. Source-Drain Diode Forward



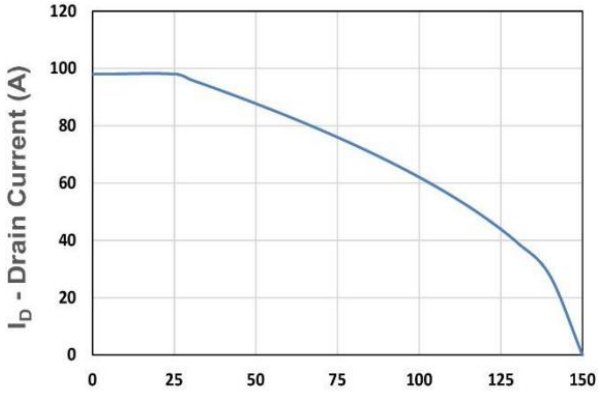
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



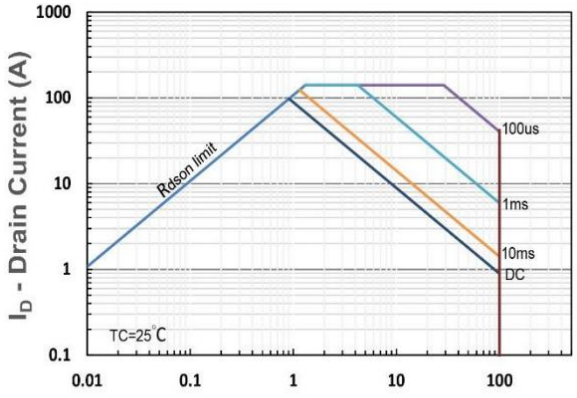
Qg, Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



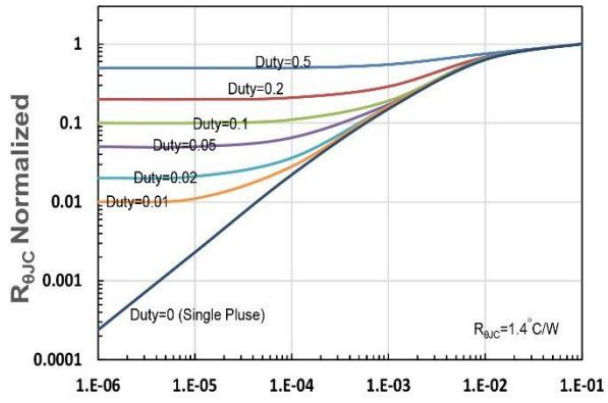
Tc - Case Temperature (°C)
Figure 9. Power Dissipation



Tc - Case Temperature (°C)
Figure 10. Drain Current



V_{DS} - Drain-Source Voltage (V)
Figure 11. Safe Operating Area

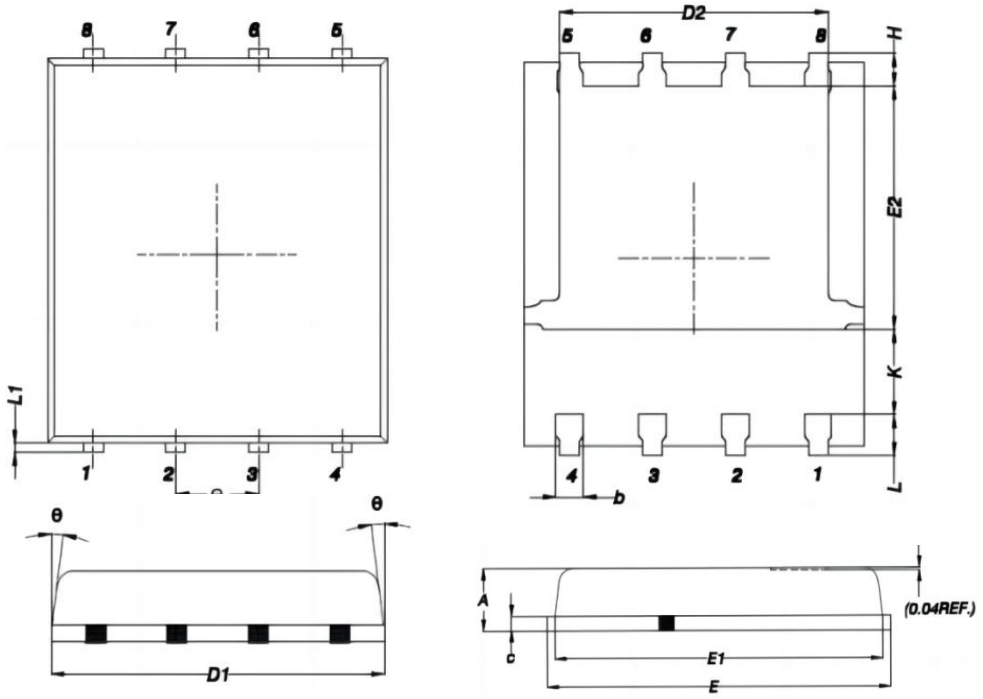


t_1,Square Wave Pulse Duration(s)
Figure 12. RθJC Transient Thermal Impedance

Package Information

PDFN5x6-8L

Dimensions in mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.200	0.850	0.047	0.031
b	0.510	0.300	0.020	0.012
C	0.300	0.200	0.012	0.008
D1	5.400	4.800	0.212	0.189
D2	4.310	3.610	0.170	0.142
E	6.300	5.850	0.248	0.230
E1	5.960	5.450	0.235	0.215
E2	3.920	3.300	0.154	0.130
e	1.27BSC		0.05BSC	
H	0.650	0.380	0.026	0.015
K	---	1.100	---	0.043
L	0.710	0.380	0.028	0.015
L1	0.250	0.050	0.009	0.002
θ	12°	0°	12°	0°

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