

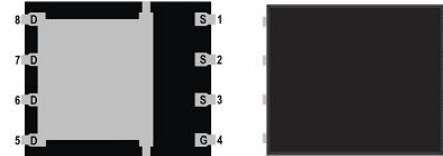
## 100V N-Channel MOSFET

### General Description

The SKQ48N10AD uses advanced Trench technology and designs to provide excellent  $R_{DS(ON)}$  with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.

### Product Summary

$V_{DSS}$	100	V
$R_{DS(ON)} @ V_{GS}=10V$	10(Max.)	mΩ
$R_{DS(ON)} @ V_{GS}=4.5V$	16(Max.)	mΩ
$I_D$	48	A



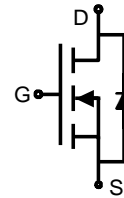
DFN5X6-8L

### Features

- Low On-Resistance
- Low Input Capacitance
- Low Miller Charge
- Low Input / Output Leakage

### Applications

- Lithium-Ion Secondary Batteries
- Load Switch
- DC-DC converters and Off-line UPS



Symbol

### Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	100V	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20V$	V
Drain Current-Continuous	$I_D$	$T_C=25^\circ\text{C}$ NOTE 3	48
		$T_C=70^\circ\text{C}$ NOTE 3	30
Drain Current-Pulsed NOTE 1	$I_{DM}$	145	A
Avalanche Current, $L=0.1\text{mH}$	$I_{AS}$	15	A
Avalanche Energy, $L=0.1\text{mH}$	$E_{AS}$	11.25	mJ
Maximum Power Dissipation @ $T_C=25^\circ\text{C}$	$P_D$	104	W
Storage Temperature Range	$T_{STG}$	-50 to $150^\circ\text{C}$	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-50 to $150^\circ\text{C}$	$^\circ\text{C}$

Parameter	Symbol	Conditions	Min.	Typ	Max	Unit
Maximum Junction-to-Ambient NOTE 2	$R_{\theta JA}$	Steady State	-	-	55	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Case	$R_{\theta JC}$	Steady State	-	-	1.2	$^\circ\text{C}/\text{W}$

## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

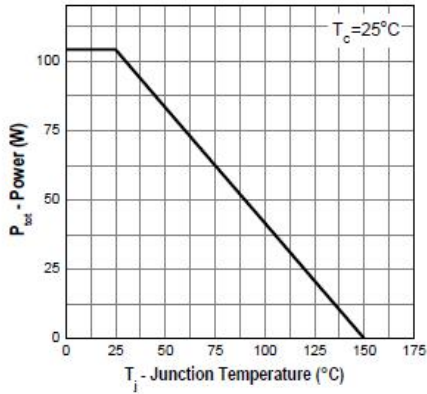
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>DS</sub> =250uA	100	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V	-	-	10	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>DS</sub> =250uA	1.2	1.7	2.5	V
Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>DS</sub> =20A	-	8.5	10	mΩ
		V <sub>GS</sub> =4.5V, I <sub>DS</sub> =10A	-	13	16	
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz	-	2020	-	pF
Output Capacitance	C <sub>oss</sub>		-	685	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	7	-	
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =10A, R <sub>GEM</sub> =3Ω	-	7.6	-	ns
Rise Time	t <sub>r</sub>		-	2.8	-	
Turn-Off Delay Time	T <sub>d(off)</sub>		-	24	-	
Fall Time	t <sub>f</sub>		-	3.8	-	
Total Gate Charge at 4.5V	Q <sub>g</sub>	V <sub>DS</sub> =50V, I <sub>DS</sub> =13A, V <sub>GS</sub> =4.5V	-	13	-	nC
Gate to Source Gate Charge	Q <sub>gs</sub>		-	6	-	
Gate to Drain "Miller" Charge	Q <sub>gd</sub>		-	3	-	
<b>SWITCHING CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A	-	-	1.2	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	V <sub>DD</sub> =50V, I <sub>f</sub> =13A, di/dt=100A/μs, T <sub>J</sub> =25°C	-	-	23	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	-	105	nC

### Notes:

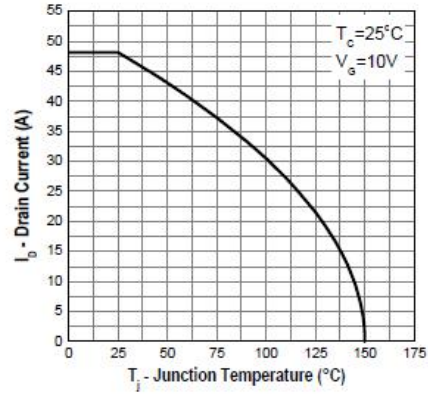
1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. R<sub>θJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R<sub>θJC</sub> is guaranteed by design while R<sub>θCA</sub> is determined by the user's board design. R<sub>θJA</sub> shown below for single device operation on FR-4 in still air.
3. The maximum current rating is limited by package.
4. Limited by T<sub>J</sub> Max., starting T<sub>J</sub>=25°C, L=0.1mH, R<sub>g</sub>=50Ω, I<sub>D</sub>=15A, V<sub>GS</sub>=10V.

## Typical Operating Characteristics (Cont.)

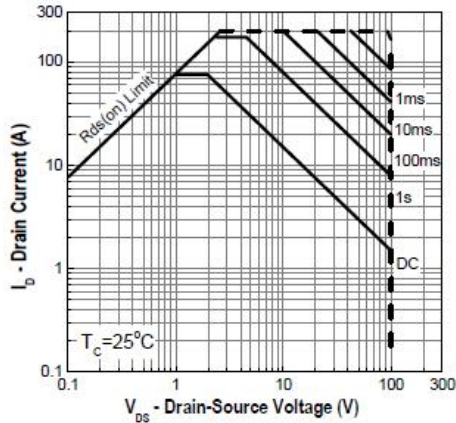
Power Dissipation



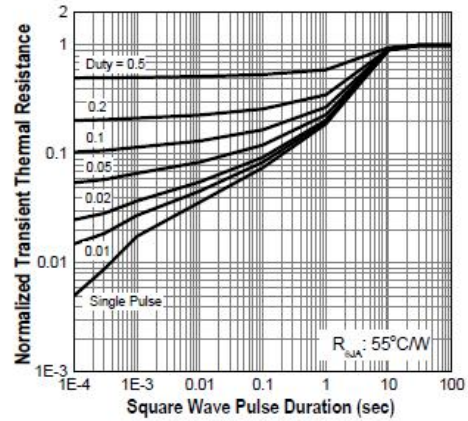
Drain Current



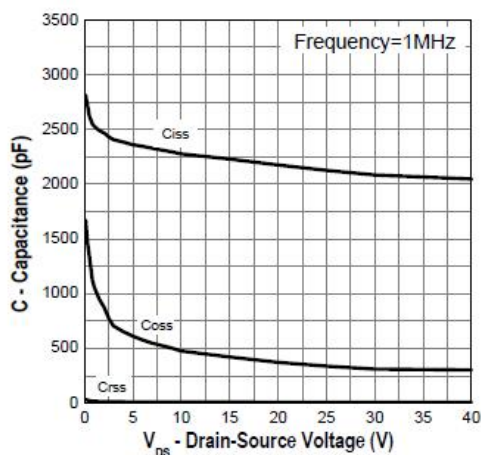
Safe Operation Area



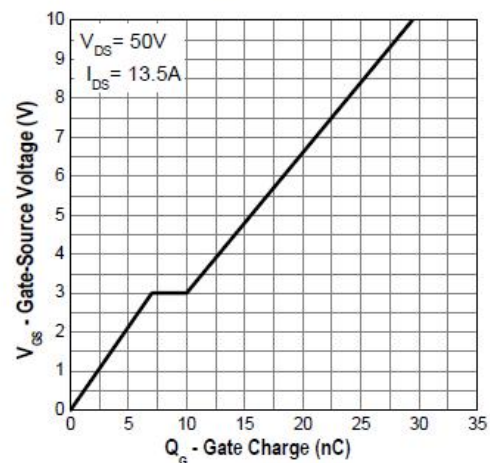
Transient Thermal Impedance



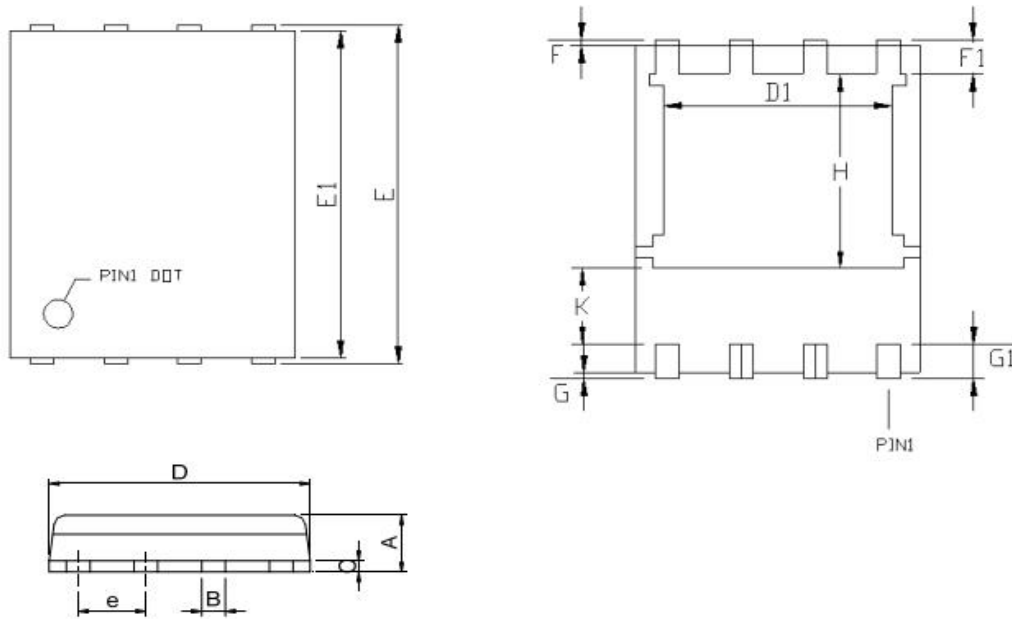
Capacitance



Gate Charge



## PACKAGE DIMENSION



Symbol	DFN5X6-8L			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.9	1.2	0.035	0.047
B	0.3	0.51	0.012	0.002
C	0.19	0.25	0.007	0.010
D	4.8	5.3	0.189	0.209
D1	3.6	4.4	0.141	0.173
E	5.9	6.2	0.232	0.244
E1	5.5	5.8	0.217	0.228
e	1.27 BSC		0.050 BSC	
F	0.05	0.3	0.002	0.012
F1	0.35	0.75	0.014	0.030
G	0.05	0.3	0.002	0.012
G1	0.35	0.75	0.014	0.030
H	3.34	3.9	0.131	0.154
K	0.762		0.03	