Elektronische Bauelemente

SSQF38N06-C

38A, 60V, $R_{DS(ON)}$ 12mΩ

N-Channel Enhancement Mode Power MOSFET

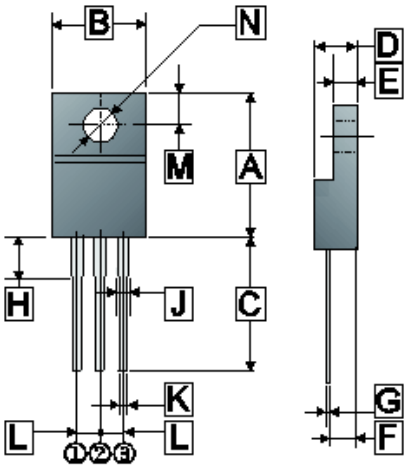
RoHS Compliant Product
A suffix of "-C" specifies halogen and lead-free

DESCRIPTION

The SSQF38N06-C is the highest performance N-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SSQF38N06-C meet the RoHS and Green Product requirement with full function reliability approved.

ITO-220

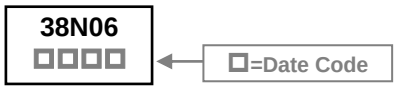


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	14.50	16.50	H	1.80	4.35
B	9.50	10.72	J	0.80	1.70
C	12.58	14.22	K	0.30	0.95
D	4.20	5.10	L	2.34	2.75
E	2.30	3.30	M	2.40	3.60
F	2.30	3.10	N	ϕ 3.0	ϕ 3.8
G	0.30	0.75			

FEATURES

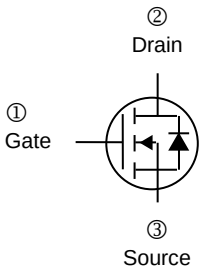
- High Speed Power Switching
- Super Gate Charge
- Green Device Available

MARKING



ORDER INFORMATION

Part Number	Type
SSQF38N06-C	Lead (Pb)-free and Halogen-free



ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1] @V_{GS}=10V	T_C=25°C	I_D	38	A
	T_C=100°C		26	
Pulsed Drain Current [2]		I_{DM}	95	A
Avalanche Current		I_{AS}	16	A
Avalanche energy [4]		E_{AS}	128	mJ
Total Power Dissipation [3]	T_C=25°C	P_D	32	W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	°C
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	3.9	

ELECTRICAL CHARACTERISTICS (T_J=25°C unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test conditions
Drain-Source Breakdown Voltage		BV_{DSS}	60	-	-	V	V_{GS}=0V, I_D=250μA
Gate Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Forward Tranconductance		g_{fs}	-	42	-	S	V_{DS}=5V, I_D=30A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}=±20V
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	-	-	1	μA	V_{DS}=48V, V_{GS}=0
	T_J=55°C		-	-	5		
Static Drain-Source On-Resistance [2]		$R_{DS(ON)}$	-	8.1	12	mΩ	V_{GS}=10V, I_D=20A
			-	10.2	15		V_{GS}=4.5V, I_D=15A
Total Gate Charge		Q_g	-	28.7	-	nC	I_D=15A V_{DS}=48V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	10.5	-		
Gate-Drain (“Miller”) Change		Q_{gd}	-	9.9	-		
Turn-on Delay Time		$T_{d(on)}$	-	10.4	-	nS	V_{DD}=30V I_D=15A V_{GS}=10V R_G=3.3Ω
Rise Time		T_r	-	9.2	-		
Turn-off Delay Time		$T_{d(off)}$	-	63	-		
Fall Time		T_f	-	4.8	-		
Input Capacitance		C_{iss}	-	3240	-	pF	V_{GS}=0V V_{DS}=15V f=1MHz
Output Capacitance		C_{oss}	-	210	-		
Reverse Transfer Capacitance		C_{rss}	-	146	-		
Source-Drain Diode							
Diode Forward Voltage [2]		V_{SD}	-	-	1.2	V	I_S=1A, V_{GS}=0V
Continuous Source Current [1]		I_S	-	-	38	A	V_G=V_D=0, Force Current
Pulsed Source Current [2]		I_{SM}	-	-	95		
Reverse Recovery Time		T_{rr}	-	18	-	nS	I_F=15A, dI/dt=100A/μs, T_J=25°C
Reverse Recovery Charge		Q_{rr}	-	14	-	nC	

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. The data tested by pulsed pulse width≦ 300us, duty cycle≦ 2%.
3. The power dissipation is limited by 150°C junction temperature.
4. The E_{AS} data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=1mH, I_{AS}=16A.

TYPICAL CHARACTERISTICS CURVE

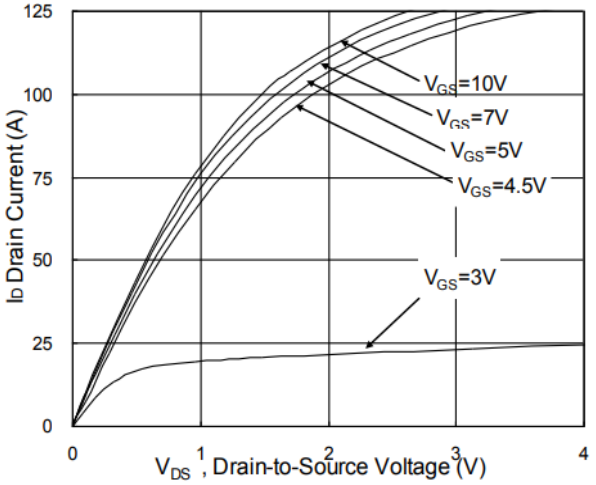


Fig.1 Typical Output Characteristics

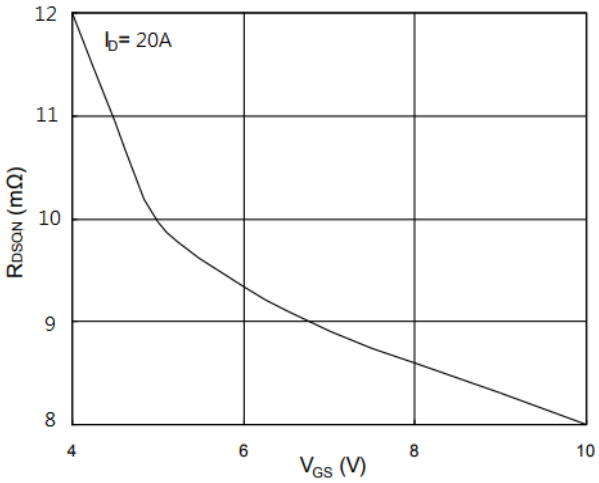


Fig.2 On-Resistance vs. Gate-Source Voltage

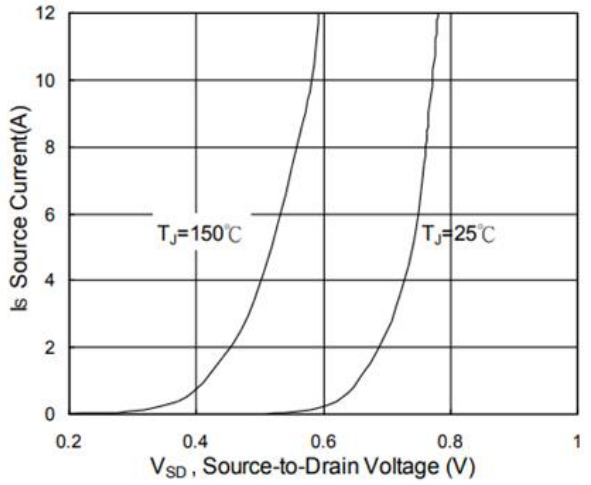


Fig.3 Forward Characteristics of Reverse

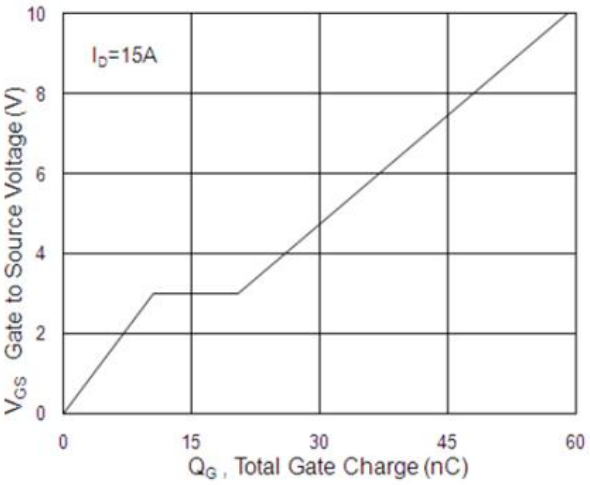


Fig.4 Gate-Charge Characteristics

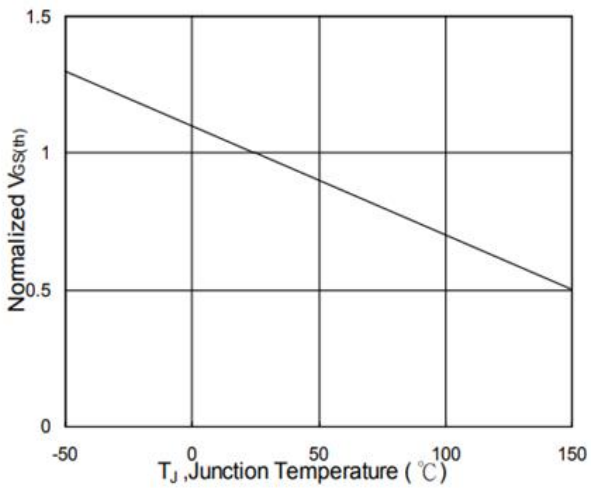


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

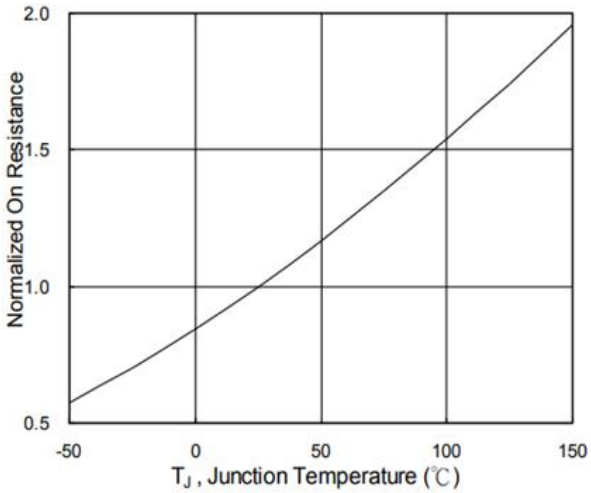


Fig.6 Normalized R_{DSON} vs. T_J

TYPICAL CHARACTERISTICS CURVE

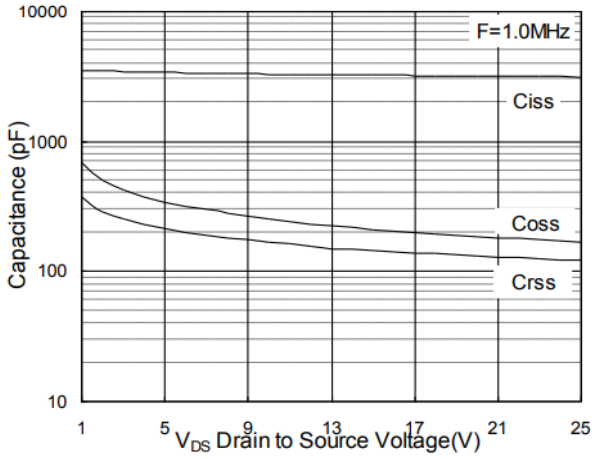


Fig.7 Capacitance

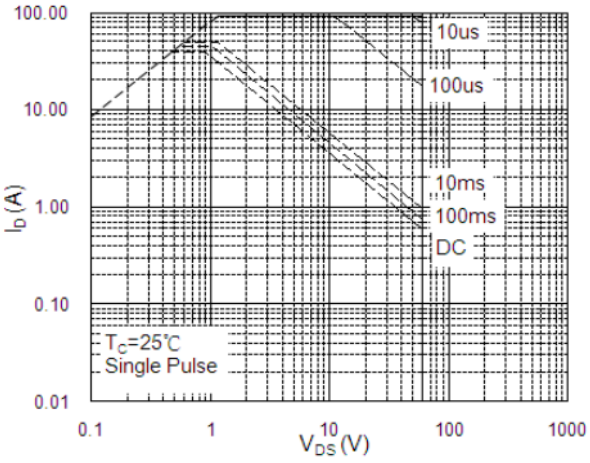


Fig.8 Safe Operating Area

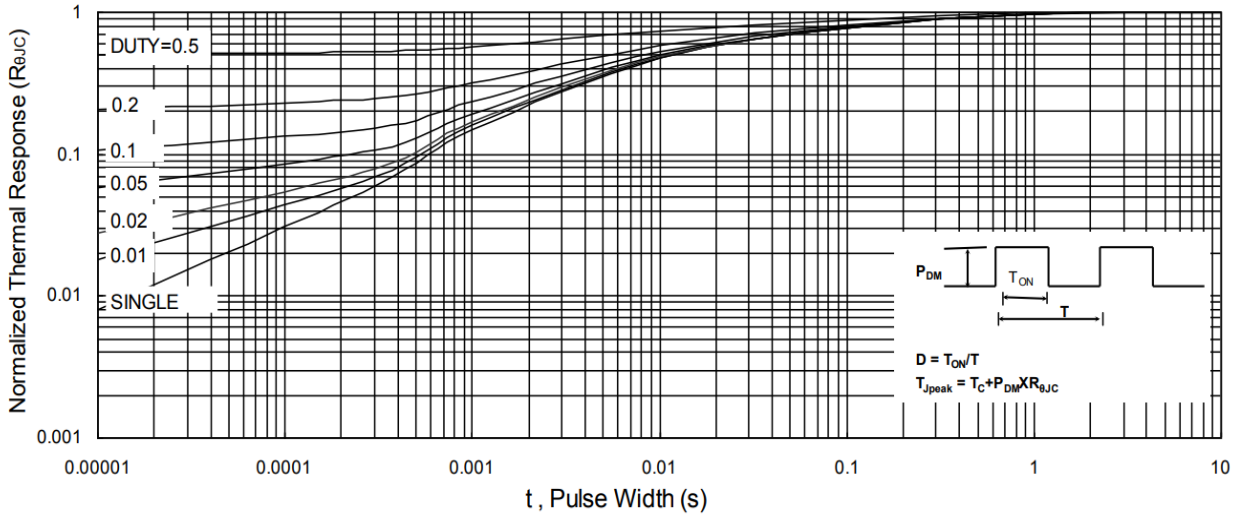


Fig.9 Normalized Maximum Transient Thermal Impedance

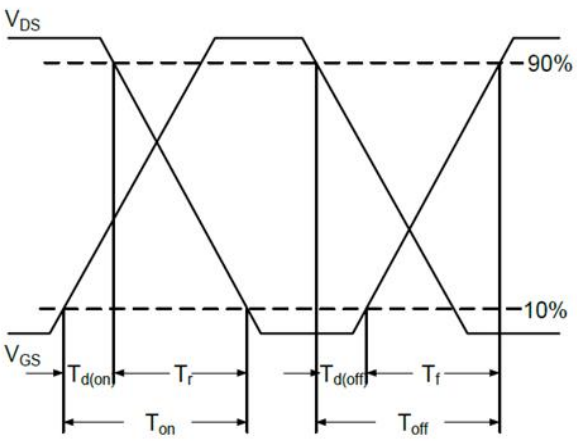


Fig.10 Switching Time Waveform

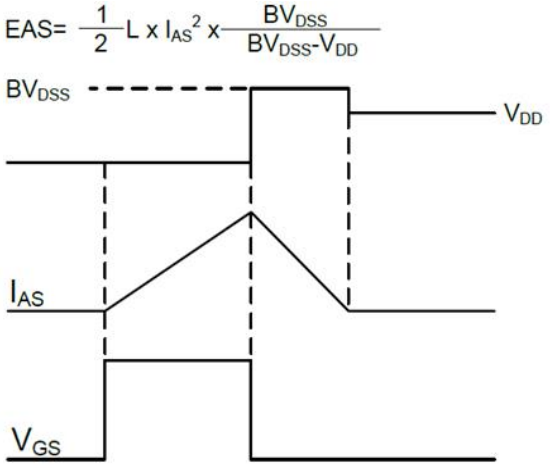


Fig.11 Unclamped Inductive Switching Waveform