

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

DESCRIPTION

The SSQF50N10S-C is the highest performance trench 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 SSQF50N10S-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

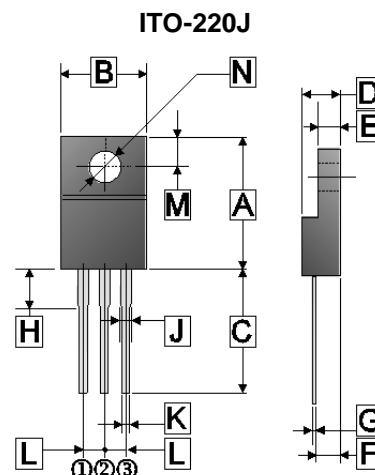
- High Speed Power Switching
- Super Low Gate Charge
- Green Device Available

MARKING

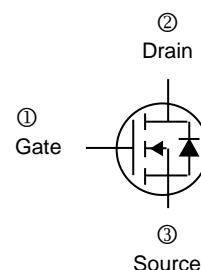


ORDER INFORMATION

Part Number	Type
SSQF50N10S-C	Lead (Pb)-free and Halogen-free



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	14.8	15.2	H	2.2 REF.	
B	9.96	10.36	J	0.9 REF.	
C	13.20 REF.		K	0.5	0.75
D	4.35	4.65	L	2.54 REF.	
E	2.85	3.15	M	2.70 REF.	
F	2.60	2.80	N	φ 3.5 REF.	
G	0.50	0.75			



ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current ¹ @ $V_{GS}=10\text{V}$	I_D	$T_C=25^\circ\text{C}$	50
		$T_C=100^\circ\text{C}$	32
Pulsed Drain Current ²	I_{DM}	120	A
Power Dissipation ³	P_D	29.7	W
Operating Junction and 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	$R_{\theta JC}$	4.2	

ELECTRICAL CHARACTERISTICS ($T_J=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	100	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	1	-	2.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Forward Transconductance	g_{fs}	-	85	-	S	$V_{DS}=5V, I_D=20A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20V$
Drain-Source Leakage Current	I_{DSS}	-	-	1	μA	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ C$
		-	-	5		$V_{DS}=80V, V_{GS}=0V, T_J=100^\circ C$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	5.8	9	m Ω	$V_{GS}=10V, I_D=13.5A$
		-	7	11		$V_{GS}=4.5V, I_D=11.5A$
Total Gate Charge	Q_g	-	45	-	nC	$I_D=13.5A$ $V_{DS}=50V$ $V_{GS}=10V$
Gate-Source Charge	Q_{gs}	-	9.5	-		
Gate-Drain Change	Q_{gd}	-	4.8	-		
Turn-on Delay Time	$T_{d(on)}$	-	10	-	nS	$V_{DD}=50V$ $I_D=13.5A$ $V_{GS}=10V$ $R_G=3\Omega$
Rise Time	T_r	-	6.5	-		
Turn-off Delay Time	$T_{d(off)}$	-	45	-		
Fall Time	T_f	-	7.5	-		
Input Capacitance	C_{iss}	-	3320	-	pF	$V_{GS}=0V$ $V_{DS}=50V$ $f=1MHz$
Output Capacitance	C_{oss}	-	605	-		
Reverse Transfer Capacitance	C_{rss}	-	20	-		
Source-Drain Diode						
Diode Forward Voltage ²	V_{SD}	-	-	1.2	V	$I_S=1A, V_{GS}=0V$
Continuous Source Current ¹	I_S	-	-	50	A	$V_{DS}=V_{GS}=0V, \text{Force Current}$
Reverse Recovery Time	t_{rr}	-	33	-	nS	$I_F=13.5A, di/dt=100A/\mu s, T_J=25^\circ C$
Reverse Recovery Charge	Q_{rr}	-	150	-	nC	

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
2. The data tested by pulsed pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. The power dissipation is limited by 150°C junction temperature.

TYPICAL CHARACTERISTIC

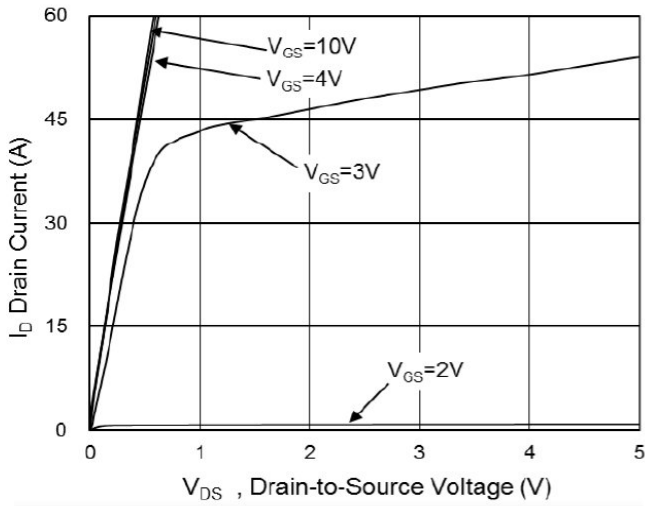


Fig.1 Typical Output Characteristics

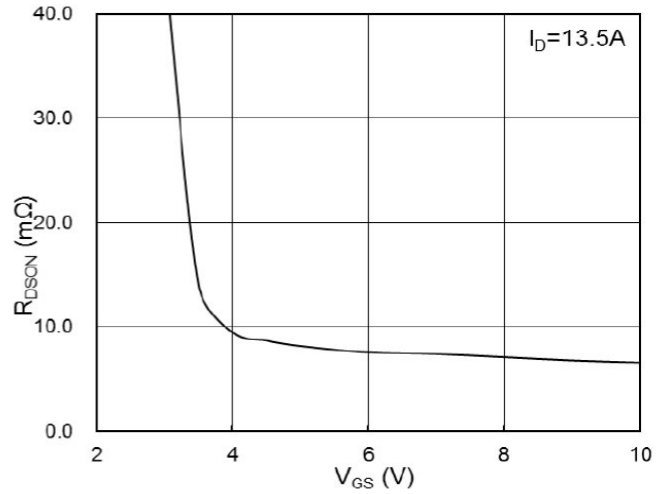


Fig.2 On-Resistance vs G-S Voltage

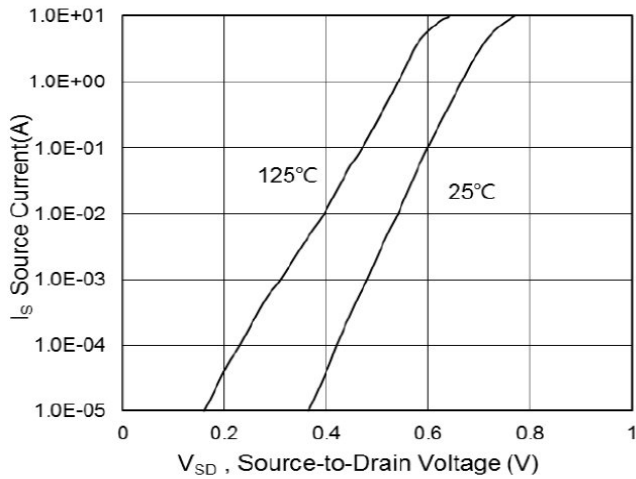


Fig.3 Source-Drain Forward Characteristics

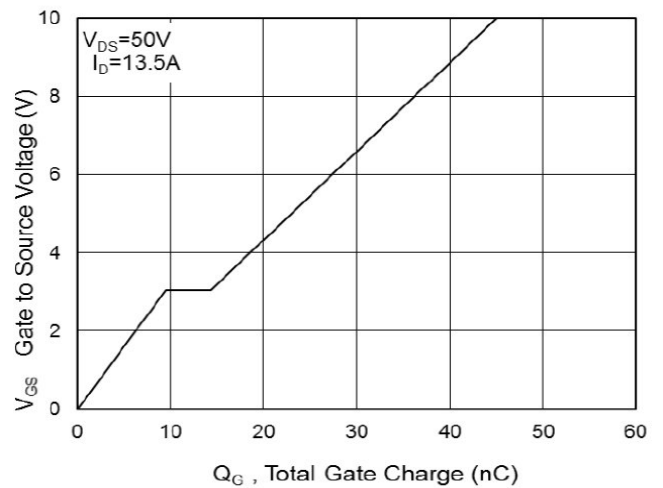


Fig.4 Gate-Charge Characteristics

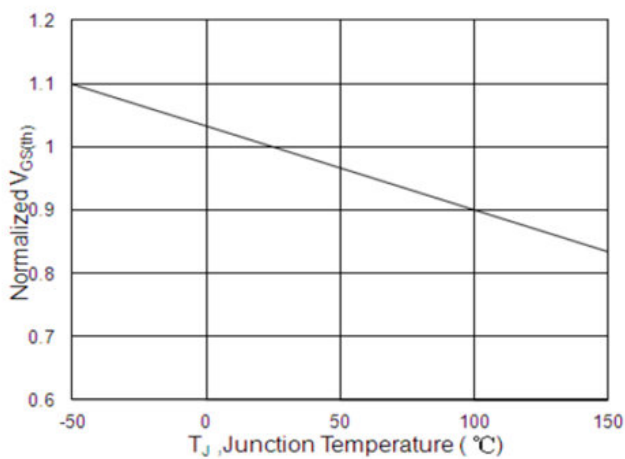


Fig.5 Normalized $V_{GS(th)}$ vs T_J

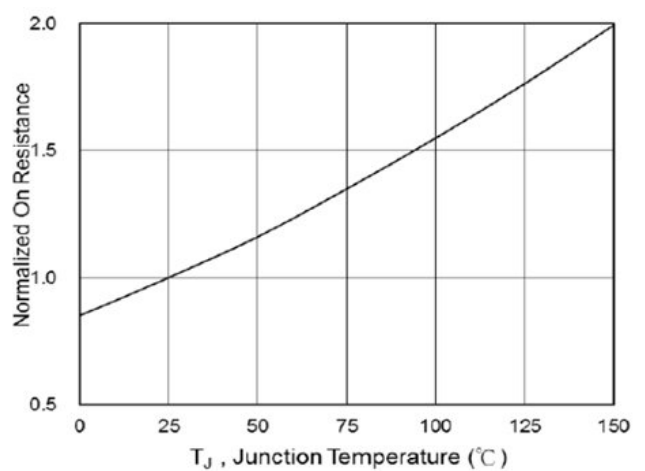


Fig.6 Normalized $R_{DS(on)}$ vs T_J

TYPICAL CHARACTERISTIC

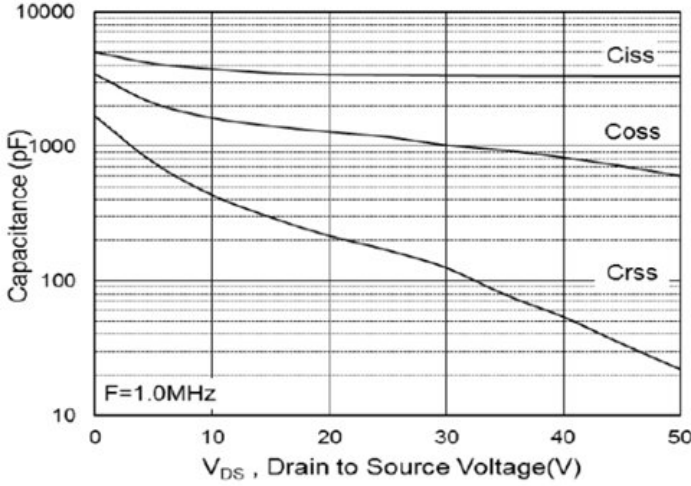


Fig.7 Capacitance

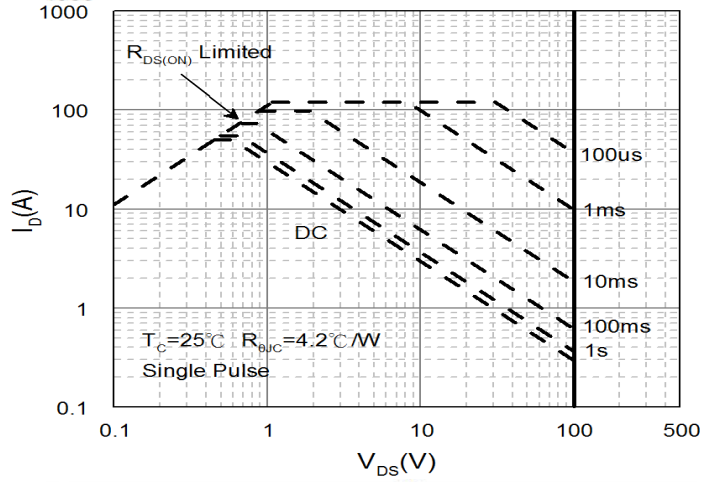


Fig.8 Safe Operating Area

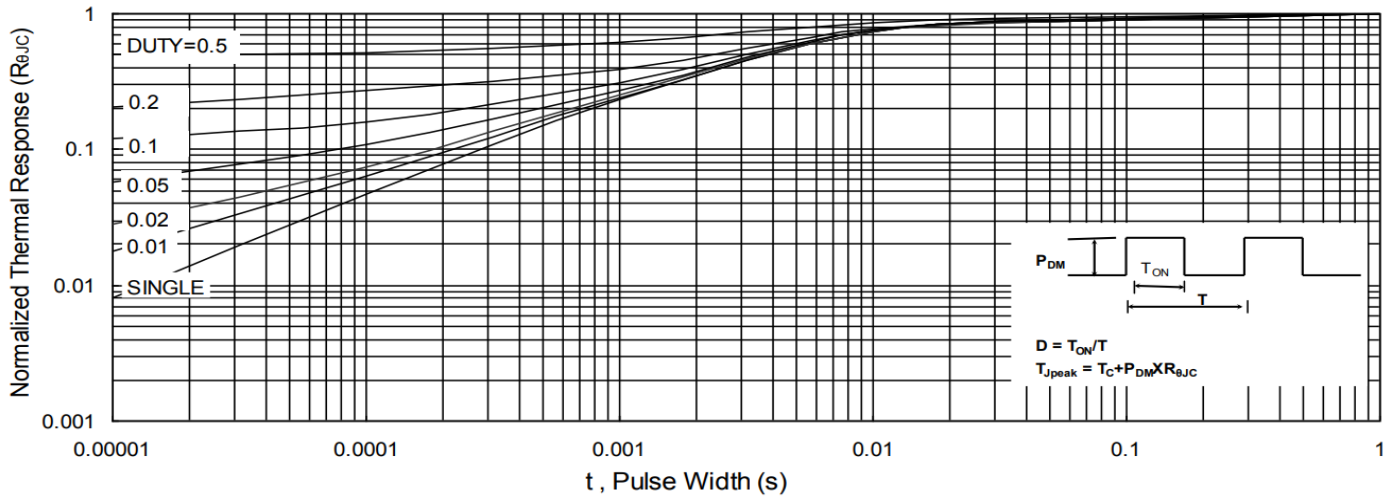


Fig.9 Normalized Maximum Transient Thermal Impedance

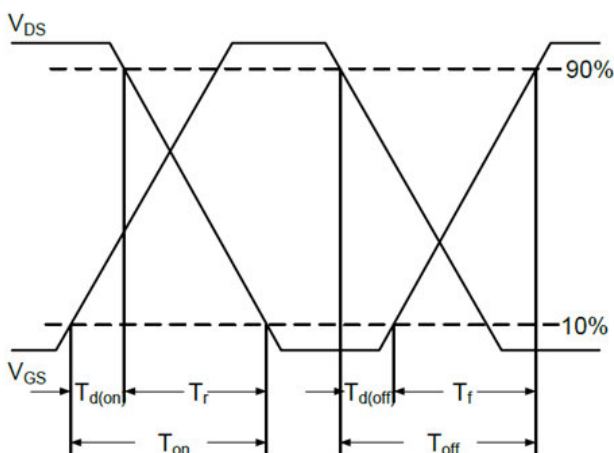


Fig.10 Switching Time Waveform

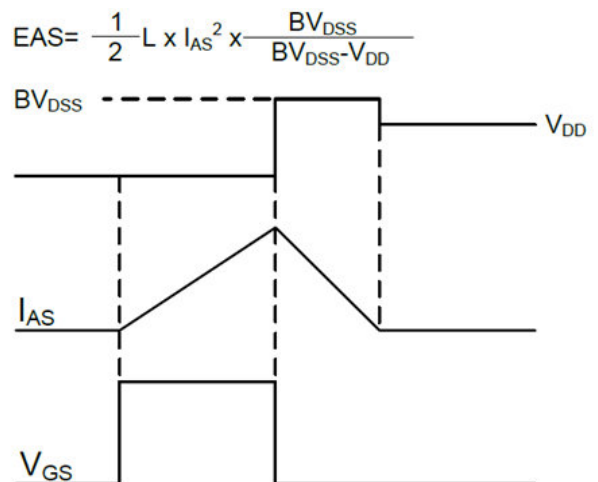


Fig.11 Unclamped Inductive Switching Waveform