

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

DESCRIPTION

The SSQF60N12SV-C is the Shielded Gate Technology 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 SSQF60N12SV-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

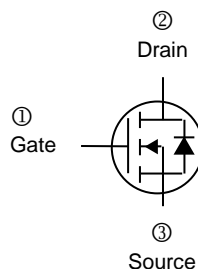
- Shielded Gate Trench Technology
- Super Low Gate Charge
- Green Device Available

MARKING

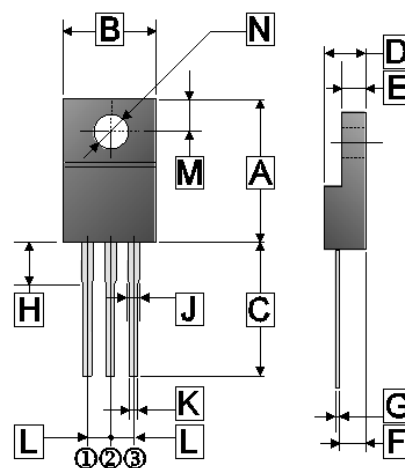


ORDER INFORMATION

Part Number	Type
SSQF60N12SV-C	Lead (Pb)-free and Halogen-free



ITO-220J



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	14.50	15.50	H	3.80 TYP.	
B	9.50	10.50	J	1.30 REF.	
C	13.20 REF.		K	0.30	0.90
D	4.24	4.84	L	2.54 REF.	
E	2.52	3.20	M	2.70 REF.	
F	2.50	2.90	N	ϕ 3.50 REF.	
G	0.47	0.75			

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹ @ $V_{GS}=10\text{V}$	I_D	$T_C=25^\circ\text{C}$	60
		$T_C=100^\circ\text{C}$	43
Pulsed Drain Current ²	I_{DM}	320	A
Total Power Dissipation	P_D	47	W
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55~175	$^\circ\text{C}$
Thermal Resistance Ratings			
Maximum Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Maximum Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	3.2	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions	
Drain-Source Breakdown Voltage	BV_{DSS}	120	-	-	V	$V_{GS}=0V, I_D=250\mu A$	
Gate Threshold Voltage	$V_{GS(th)}$	2	-	4	V	$V_{DS}=V_{GS}, I_D=250\mu A$	
Forward Transfer Conductance ²	g_{fs}	-	80	-	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}	$T_J=25^\circ\text{C}$	-	-	1	μA	$V_{DS}=96V, V_{GS}=0$
		$T_J=55^\circ\text{C}$	-	-	100		$V_{DS}=96V, V_{GS}=0$
Static Drain-Source On-Resistance ³	$R_{DS(ON)}$	-	6	7	m Ω	$V_{GS}=10V, I_D=20A$	
Gate Resistance	R_g	-	2.5	-	Ω	$f=1\text{MHz}$	
Total Gate Charge	Q_g	-	38	-	nC	$I_D=20A$ $V_{DD}=60V$ $V_{GS}=10V$	
Gate-Source Charge	Q_{gs}	-	12	-			
Gate-Drain ("Miller") Charge	Q_{gd}	-	5	-			
Turn-on Delay Time	$T_{d(on)}$	-	16	-	nS	$V_{DD}=60V$ $I_D=20A$ $V_{GS}=10V$ $R_G=10\Omega$	
Rise Time	T_r	-	9	-			
Turn-off Delay Time	$T_{d(off)}$	-	27	-			
Fall Time	T_f	-	12	-			
Input Capacitance	C_{iss}	-	3382	-	pF	$V_{GS}=0V$ $V_{DS}=60V$ $f=1\text{MHz}$	
Output Capacitance	C_{oss}	-	438	-			
Reverse Transfer Capacitance	C_{rss}	-	8	-			
Source-Drain Diode							
Diode Forward Voltage ³	V_{SD}	-	0.9	1.2	V	$I_F=20A, V_{GS}=0V$	
Reverse Recovery Time	t_{rr}	-	50	-	nS	$I_F=20A, di/dt=500A/\mu s,$	
Reverse Recovery Charge	Q_{rr}	-	300	-	nC	$V_R=60V$	

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2oz copper.
2. The Pulse width limited by maximum junction temperature, Pulse Width $\leq 10\mu s$, Duty Cycle $\leq 2\%$.
3. The Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

TYPICAL CHARACTERISTICS CURVE

Fig 1. Typical Output Characteristics

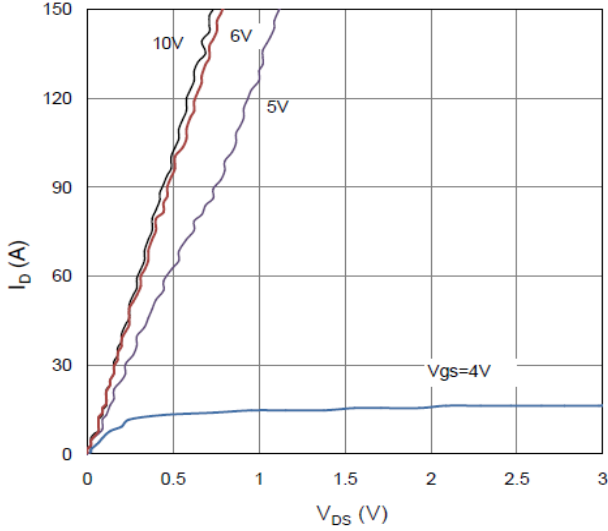


Figure 2. On-Resistance vs. Gate-Source Voltage

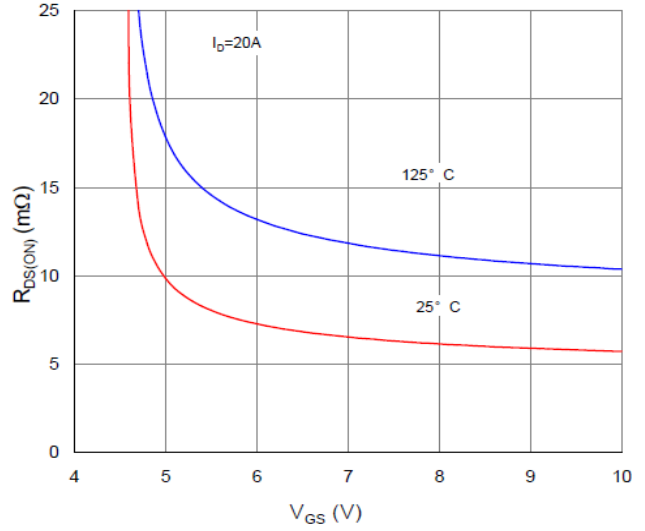


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

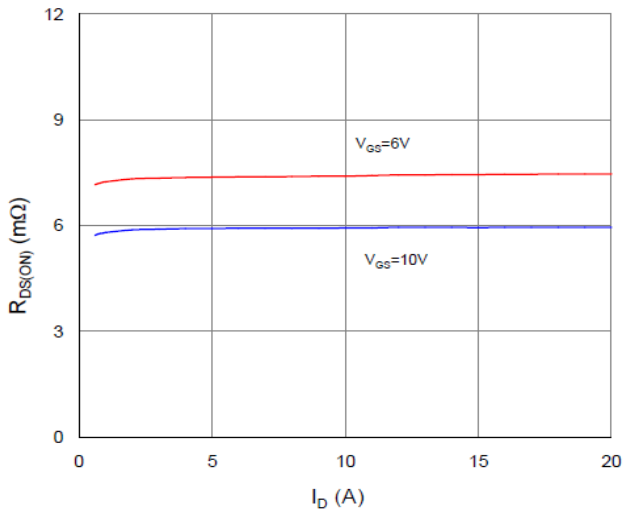


Figure 4. Normalized On-Resistance vs. Junction Temperature

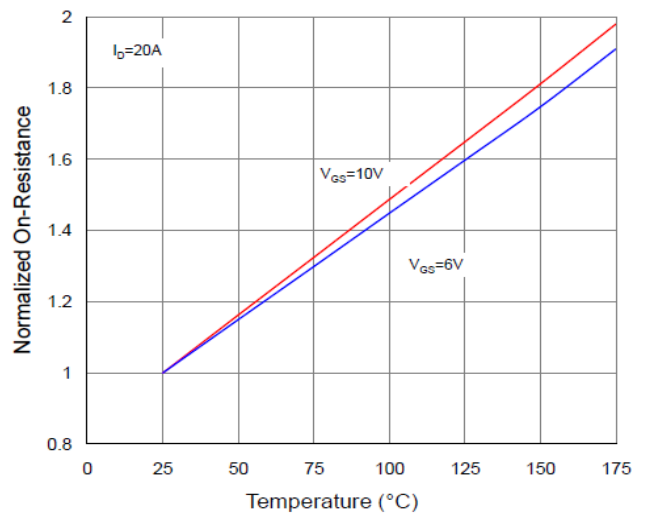


Figure 5. Typical Transfer Characteristics

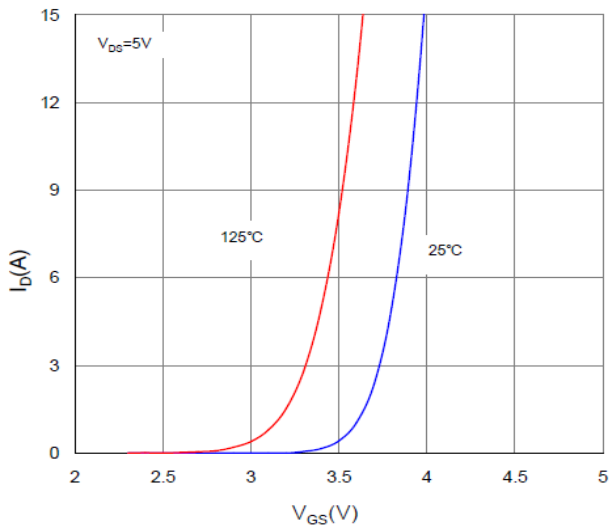
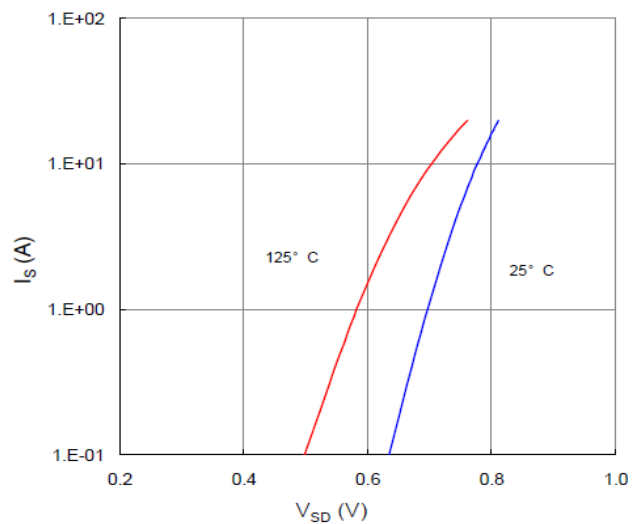


Figure 6. Typical Source-Drain Diode Forward Voltage



TYPICAL CHARACTERISTICS CURVE

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

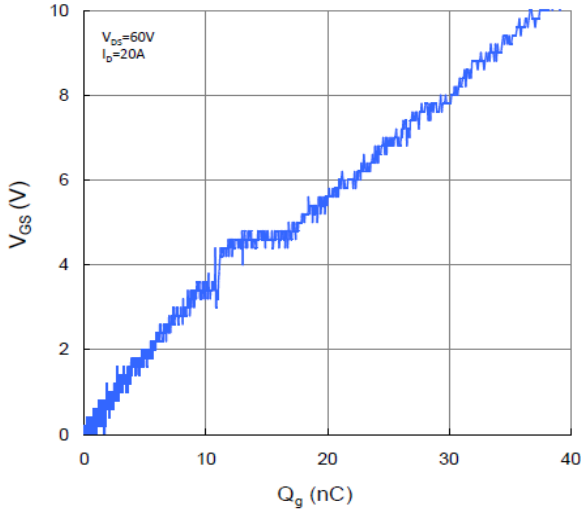


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

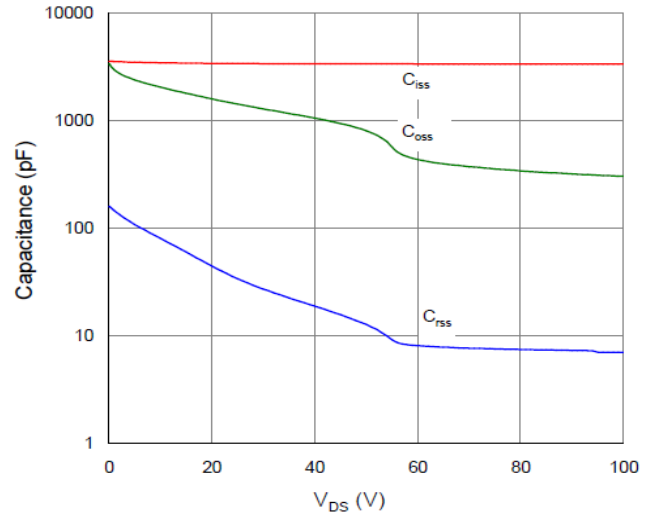


Figure 9. Maximum Safe Operating Area

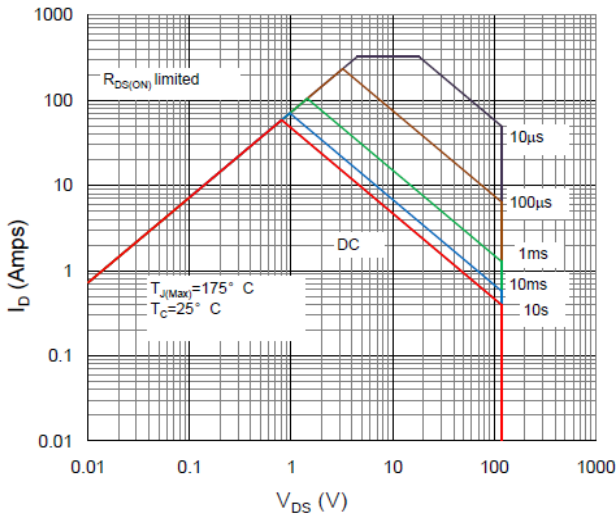


Figure 10. Maximum Drain Current vs. Case Temperature

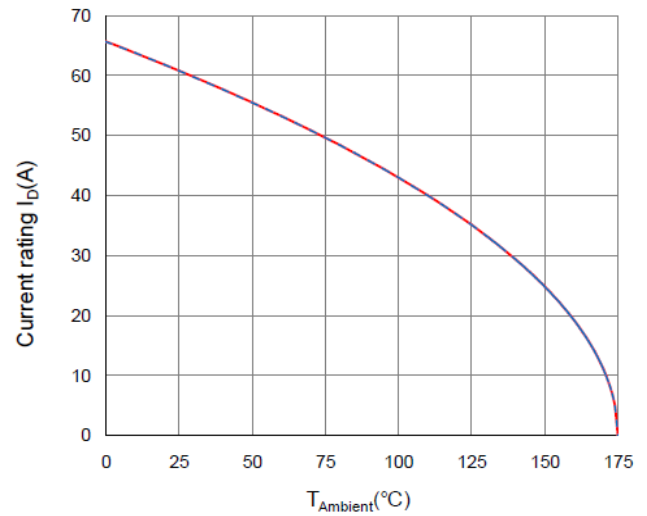


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient

