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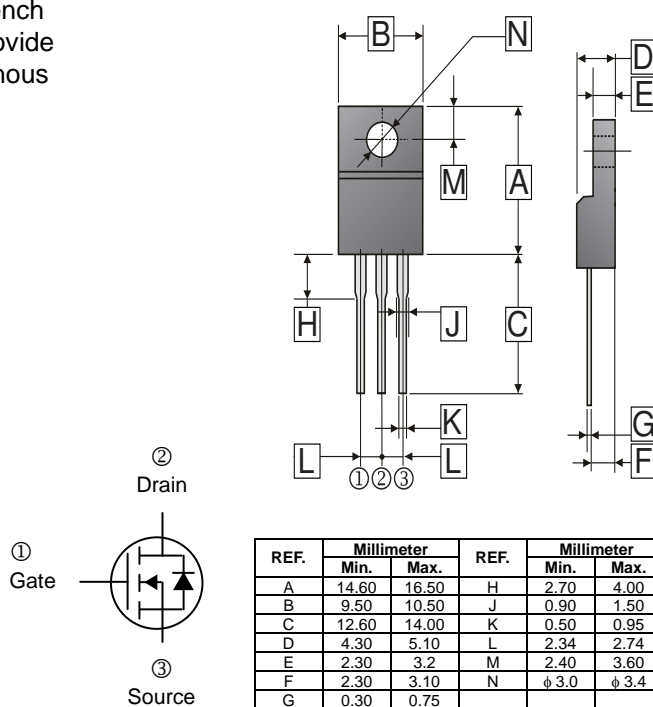A suffix of "-C" specifies halogen free

DESCRIPTION

The SSRF12N65SL 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 .

FEATURES

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

ITO-220

① Gate
② Drain
③ Source

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	14.60	16.50	H	2.70	4.00
B	9.50	10.50	J	0.90	1.50
C	12.60	14.00	K	0.50	0.95
D	4.30	5.10	L	2.34	2.74
E	2.30	3.2	M	2.40	3.60
F	2.30	3.10	N	φ 3.0	φ 3.4
G	0.30	0.75			

ABSOLUTE MAXIMUM RATINGS (T$_A$=25℃ unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	T$_C$=25℃	I_D	12	A
	T$_C$=100℃		9	A
Pulsed Drain Current		I_{DM}	48	A
Total Power Dissipation	T$_C$=25℃	P_D	51	W
	Derate above 25℃		0.41	
Single Pulse Avalanche Energy [1]		E_{AS}	786	mJ
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150	℃
Thermal Resistance Rating				
Maximum Thermal Resistance Junction-Ambient		$R_{\theta JA}$	120	℃ / W
Maximum Thermal Resistance Junction-Case		$R_{\theta JC}$	2.44	℃ / W

Notes:
1. L=30mH, I_{AS}=6.66A, V_{DD}=140V, R_G=25Ω, Starting T_J =25℃

ELECTRICAL CHARACTERISTICS (T$_J$ = 25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
Static						
Drain-Source Breakdown Voltage	BV$_{DSS}$	650	-	-	V	V$_{GS}$=0, I$_D$= 250µA
Gate-Threshold Voltage	V$_{GS(th)}$	2	-	4	V	V$_{DS}$=V$_{GS}$, I$_D$=250µA
Gate-Source Leakage Current	I$_{GSS}$	-	-	±100	nA	V$_{GS}$= ±30V
Drain-Source Leakage Current	I$_{DSS}$	-	-	1	µA	V$_{DS}$=650V, V$_{GS}$=0
Static Drain-Source On-Resistance	R$_{DS(ON)}$	-	0.64	0.8	Ω	V$_{GS}$=10V, I$_D$=6A
Total Gate Charge [1,2]	Q$_g$	-	24.15	-	nC	I$_D$=12A V$_{DS}$=520V V$_{GS}$=10V
Gate-Source Charge [1,2]	Q$_{gs}$	-	7.86	-		
Gate-Drain Change [1,2]	Q$_{gd}$	-	7.47	-		
Turn-on Delay Time [1,2]	T$_{d(on)}$	-	37.67	-	nS	V$_{DD}$=325V I$_D$=12A R$_G$=25 Ω
Rise Time [1,2]	T$_r$	-	61.67	-		
Turn-off Delay Time [1,2]	T$_{d(off)}$	-	80.33	-		
Fall Time [1,2]	T$_f$	-	46.67	-		
Input Capacitance	C$_{iss}$	-	1476	-	pF	V$_{GS}$=0 V$_{DS}$=25V f =1.0MHz
Output Capacitance	C$_{oss}$	-	152	-		
Reverse Transfer Capacitance	C$_{rss}$	-	4.5	-		
Source-Drain Diode						
Diode Forward Voltage	V$_{SD}$	-	-	1.4	V	I$_S$=12A, V$_{GS}$=0
Continuous Source Current	I$_S$	-	-	12	A	Integral Reverse P-N Junction Diode in the MOSFET
Pulsed Source Current	I$_{SM}$	-	-	48	A	
Reverse Recovery Time	T$_{rr}$	-	590.61	-	ns	I$_S$=12A,V$_{GS}$=0, dI$_F$/dt=100A/µS
Reverse Recovery Charge	Q$_{rr}$	-	5.62	-	µC	

Notes:
1. Pulse Test: Pulse width ≦300µS, Duty cycle≦2%
2. Essentially independent of operating temperature.

SeCoS
Elektronische Bauelemente

CHARACTERISTIC CURVES
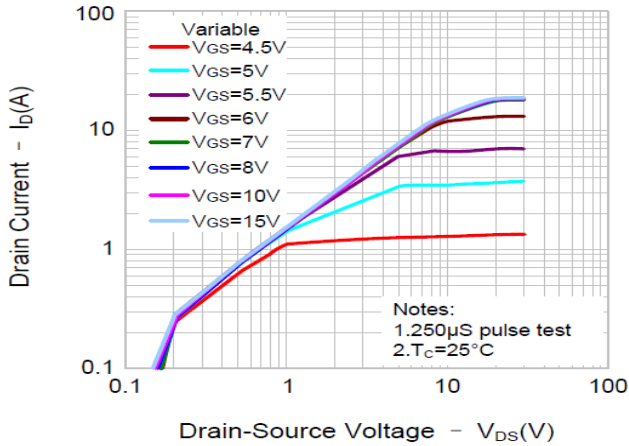

Figure 1. On-Region Characteristics
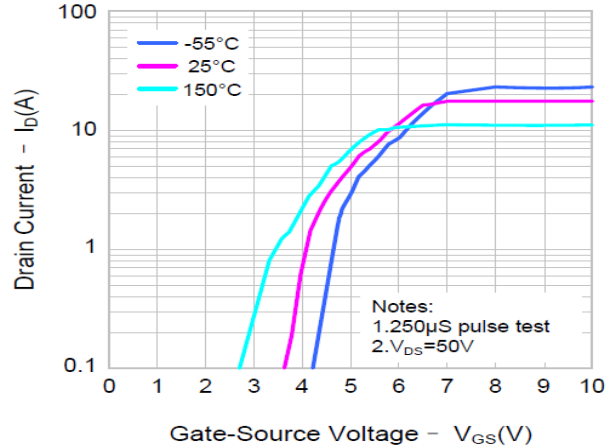

Figure 2. Transfer Characteristics

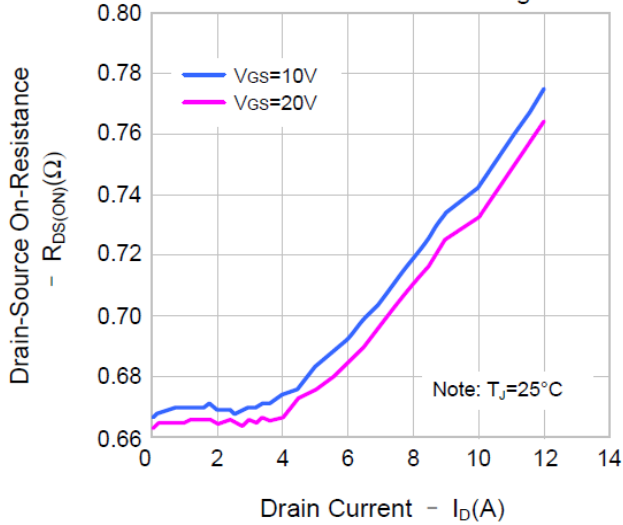Figure 3. On-Resitance Variation vs. Drain Current and Gate Voltage

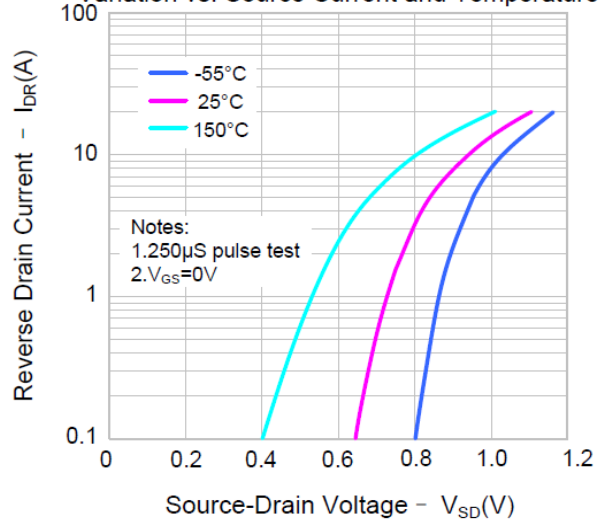Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature
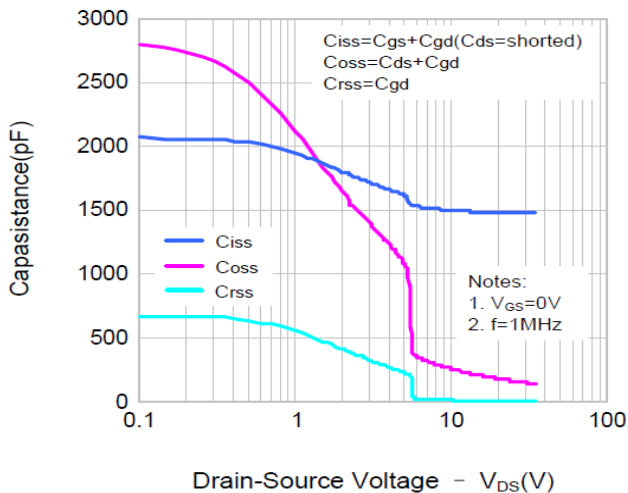

Figure 5. Capacitance Characteristics

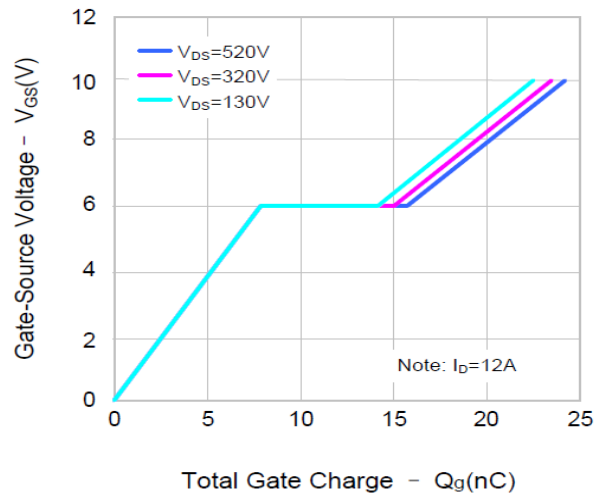Figure 6. Gate Charge Characteristics

CHARACTERISTIC CURVES
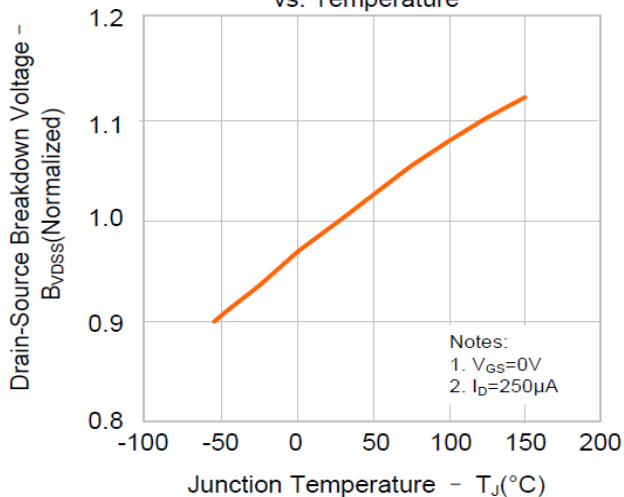

Figure 7. Breakdown Voltage Variation vs. Temperature

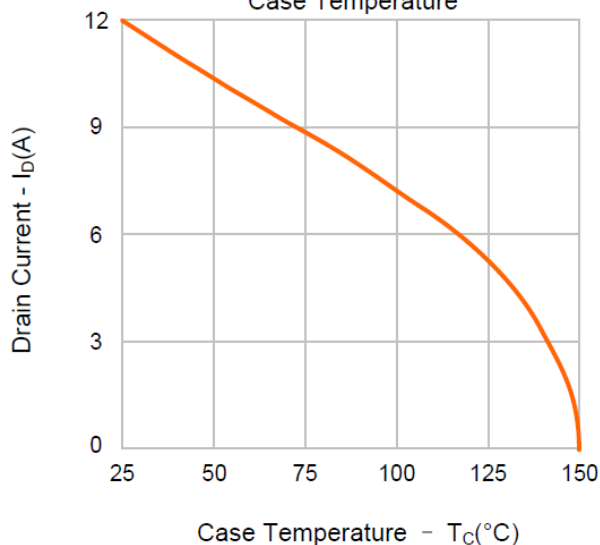Figure 8. On-resistance Variation vs. Temperature
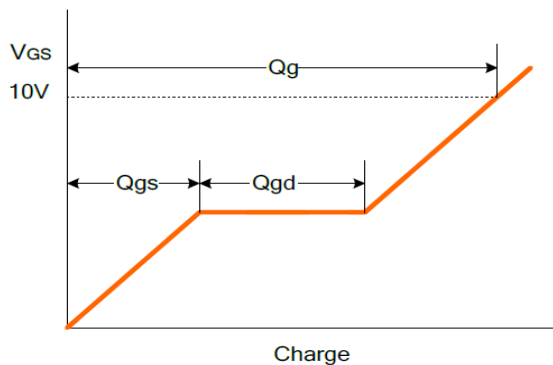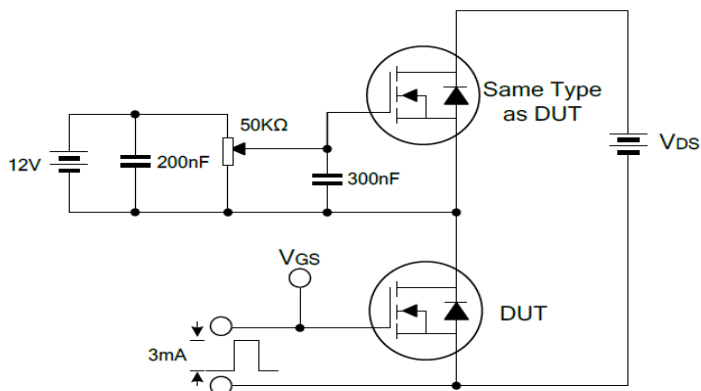

Figure 9 Max. Safe Operating Area

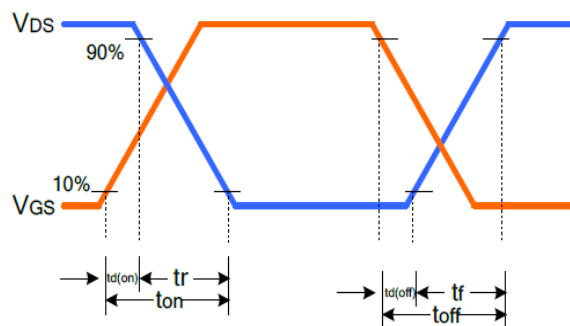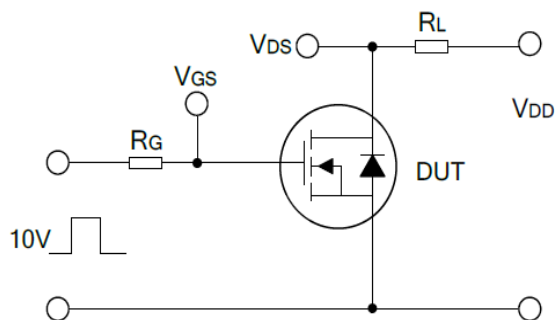Figure 10. Maximum Drain Current vs. Case Temperature

TYPICAL TEST CURVES

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveform

Unclamped Inductive Switching Test Circuit & Waveform

$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{B_{VDSS}}{B_{VDSS} - V_{DD}}$$