

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

## DESCRIPTION

The SSQF12N65J-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 SSQF12N65J-C meet the RoHS and Green Product requirement with full function reliability approved.

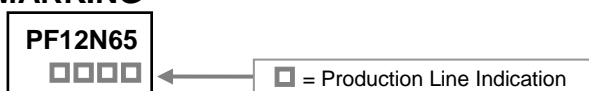
ITO-220J



## FEATURES

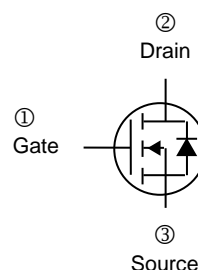
- High Current Rating
- Super Low Gate Charge
- Lower  $R_{DS(ON)}$
- Low Reverse Transfer Capacitance
- Fast Switching Capability

## MARKING



## ORDER INFORMATION

Part Number	Type
SSQF12N65J-C	Lead (Pb)-free and Halogen-free



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	650	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current <sup>1</sup>	$I_D$	12	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	48	A
Single Pulsed Avalanche Energy <sup>3</sup>	$E_{AS}$	540	mJ
Power Dissipation <sup>1</sup>	$P_D$	50	W
Maximum Lead Temperature for Soldering Purposes @1/8" from case for 5 seconds	$T_L$	260	$^\circ\text{C}$
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
Thermal Resistance Ratings			
Thermal Resistance from Junction-Ambient <sup>5</sup>	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Thermal Resistance from Junction-Case <sup>1</sup>	$R_{\theta JC}$	2.5	

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

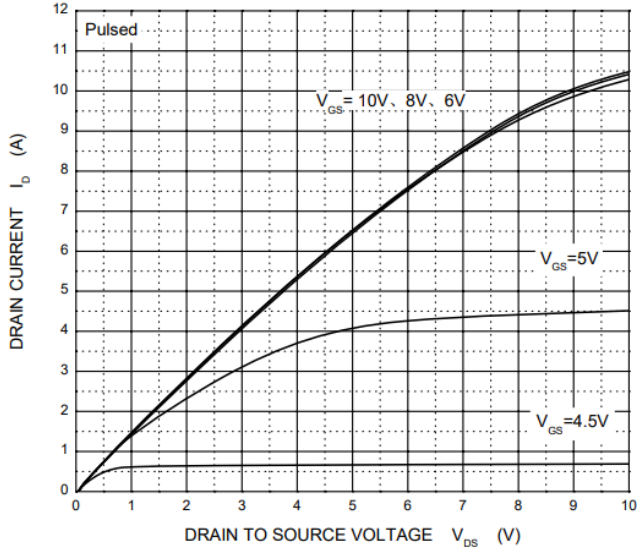
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	650	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate Threshold Voltage <sup>4</sup>	$V_{GS(th)}$	2	-	4	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Gate-Source Leakage Current <sup>4</sup>	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 30V$
Drain-Source Leakage Current	$I_{DSS}$	-	-	10	$\mu A$	$V_{DS}=650V, V_{GS}=0V$
Static Drain-Source On-Resistance <sup>4</sup>	$R_{DS(ON)}$	-	0.7	0.85	$\Omega$	$V_{GS}=10V, I_D=6A$
Total Gate Charge	$Q_g$	-	42	-	nC	$I_D=12A$ $V_{DS}=520V$ $V_{GS}=10V$
Gate-Source Charge	$Q_{gs}$	-	8.6	-		
Gate-Drain Charge	$Q_{gd}$	-	21	-		
Turn-on Delay Time	$T_{d(on)}$	-	30	-	nS	$V_{DD}=325V$ $I_D=12A$ $V_{GS}=10V$ $R_G=25\Omega$
Rise Time	$T_r$	-	90	-		
Turn-off Delay Time	$T_{d(off)}$	-	160	-		
Fall Time	$T_f$	-	90	-		
Input Capacitance	$C_{iss}$	-	1800	-	pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1MHz$
Output Capacitance	$C_{oss}$	-	200	-		
Reverse Transfer Capacitance	$C_{rss}$	-	25	-		
<b>Source-Drain Diode</b>						
Diode Forward Voltage <sup>4</sup>	$V_{SD}$	-	-	1.4	V	$I_S=12A, V_{GS}=0V$

Notes:

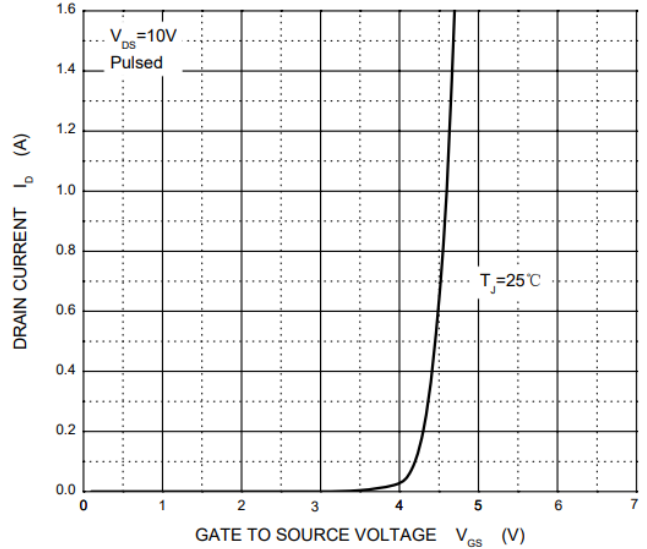
- $T_C=25^\circ\text{C}$  Limited only by maximum temperature allowed.
- Pulse Test: Pulse width $\leq 10\mu s$ , duty cycle $\leq 1\%$ .
- EAS condition:  $V_{DD}=50V, V_{GS}=10V, L=7.5mH, R_G=25\Omega$ .
- Pulse Test: Pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .
- The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$

**TYPICAL CHARACTERISTIC**

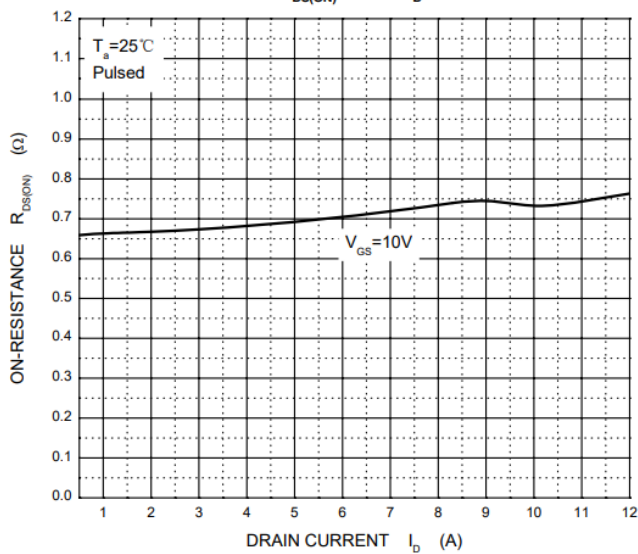
**Output Characteristics**



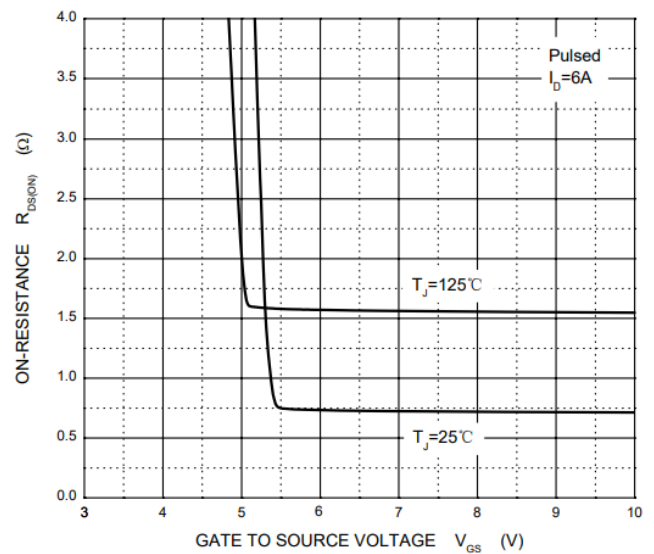
**Transfer Characteristics**



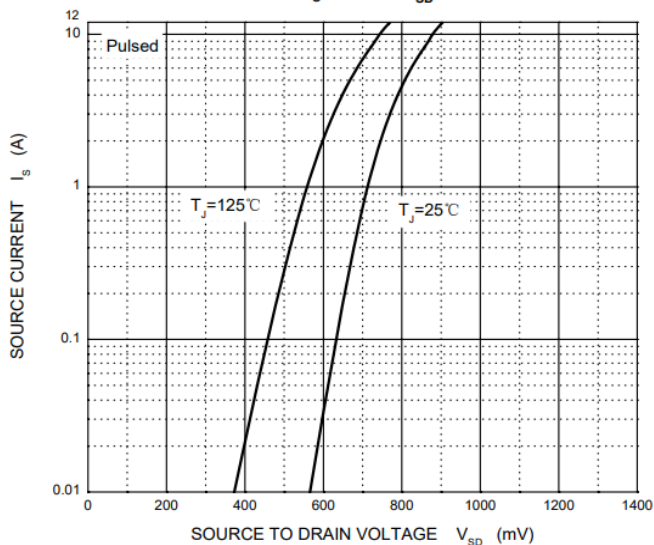
$R_{DS(ON)}$  —  $I_D$



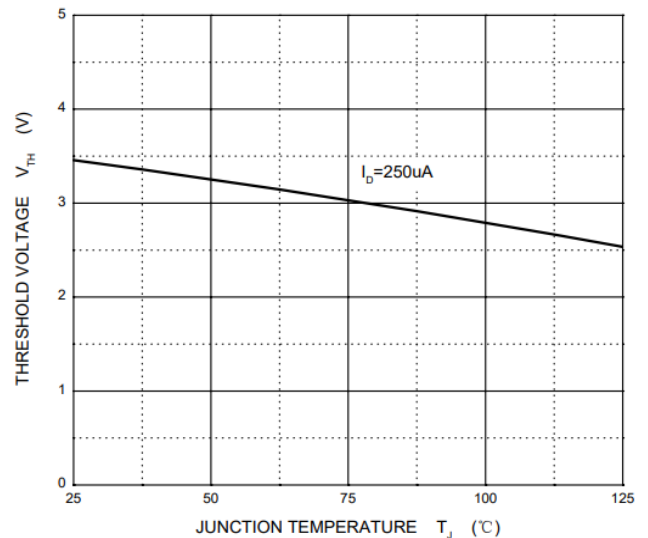
$R_{DS(ON)}$  —  $V_{GS}$



$I_S$  —  $V_{SD}$

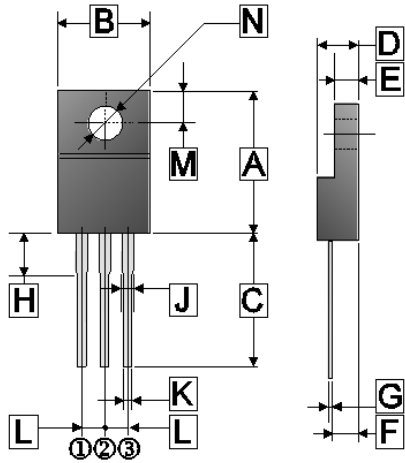


**Threshold Voltage**



**PACKAGE OUTLINE DIMENSIONS**

ITO-220J



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