

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

## DESCRIPTION

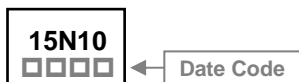
The SSD15N10J-C is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent  $R_{DS(ON)}$  and gate charge for most of the synchronous buck converter applications.

The SSD15N10J-C meet the RoHS and Green Product requirement with full function reliability approved.

## FEATURES

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Green Device Available

## MARKING



## PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-252	2.5K	13 inch

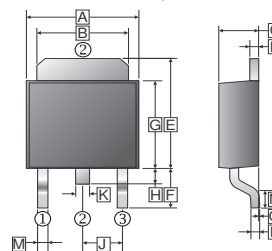
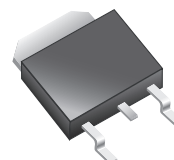
## ORDER INFORMATION

Part Number	Type
SSD15N10J-C	Lead (Pb)-free and Halogen-free

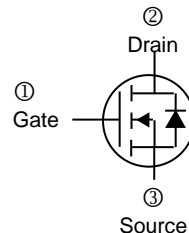
## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current @ $V_{GS}=10V$ <sup>1</sup>	$I_D$	$T_C=25^\circ C$	15
		$T_C=100^\circ C$	10.5
Pulsed Drain Current <sup>3</sup>	$I_{DM}$	30	A
Power Dissipation	$P_D$	$T_C=25^\circ C$	44.6
		$T_A=25^\circ C$	2
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 ~ 150	$^\circ C$
<b>Thermal Resistance Ratings</b>			
Maximum Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	62.5	$^\circ C / W$
Maximum Thermal Resistance Junction-Ambient <sup>2</sup>		110	
Maximum Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	2.8	

## TO-252(D-Pack)



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.3	6.9	J	2.3 REF.	
B	4.95	5.53	K	0.89 REF.	
C	2.1	2.5	M	0.45	1.14
D	0.4	0.9	N	1.55 Typ.	
E	6	7.7	O	0	0.15
F	2.90 REF.		P	0.58 REF.	
G	5.4	6.4			
H	0.6	1.2			



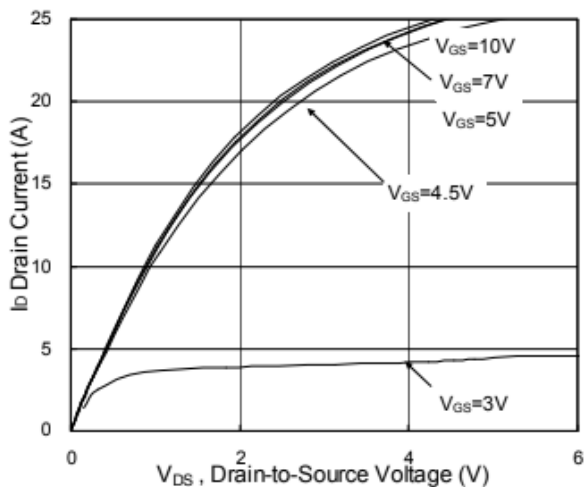
**ELECTRICAL CHARACTERISTICS** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Drain-Source Breakdown Voltage	$BV_{DSS}$	100	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	1.0	-	2.5	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 20\text{V}$
Drain-Source Leakage Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=80\text{V}, V_{GS}=0, T_J=25^\circ\text{C}$
		-	-	5		$V_{DS}=80\text{V}, V_{GS}=0, T_J=55^\circ\text{C}$
Static Drain-Source On-Resistance <sup>4</sup>	$R_{DS(ON)}$	-	-	110	m $\Omega$	$V_{GS}=10\text{V}, I_D=8\text{A}$
		-	-	120		$V_{GS}=4.5\text{V}, I_D=6\text{A}$
Total Gate Charge	$Q_g$	-	26.2	-	nC	$I_D=10\text{A}$ $V_{DS}=80\text{V}$ $V_{GS}=10\text{V}$
Gate-Source Charge	$Q_{gs}$	-	4.6	-		
Gate-Drain ("Miller") Charge	$Q_{gd}$	-	5.1	-		
Turn-on Delay Time	$T_{d(on)}$	-	4.2	-	nS	$V_{DD}=50\text{V}$ $I_D=10\text{A}$ $V_{GS}=10\text{V}$ $R_G=3.3\Omega$
Rise Time	$T_r$	-	8.2	-		
Turn-off Delay Time	$T_{d(off)}$	-	35.6	-		
Fall Time	$T_f$	-	9.6	-		
Input Capacitance	$C_{iss}$	-	1535	-	pF	$V_{GS}=0$ $V_{DS}=15\text{V}$ $f=1\text{MHz}$
Output Capacitance	$C_{oss}$	-	60	-		
Reverse Transfer Capacitance	$C_{rss}$	-	37	-		
Gate Resistance	$R_g$	-	2	-	$\Omega$	$f=1\text{MHz}$
<b>Source-Drain Diode</b>						
Continuous Source Current <sup>1</sup>	$I_S$	-	-	15	A	
Pulsed Source Current <sup>3</sup>	$I_{SM}$	-	-	30	A	
Forward On Voltage <sup>2</sup>	$V_{SD}$	-	-	1.2	V	$V_{GS}=0\text{V}, I_S=8\text{A}, T_J=25^\circ\text{C}$
Reverse Recovery Time	$t_{rr}$	-	37	-	nS	$I_F=10\text{A}, di/dt=100\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$
Reverse Recovery Charge	$Q_{rr}$	-	27.3	-	nC	$T_J=25^\circ\text{C}$

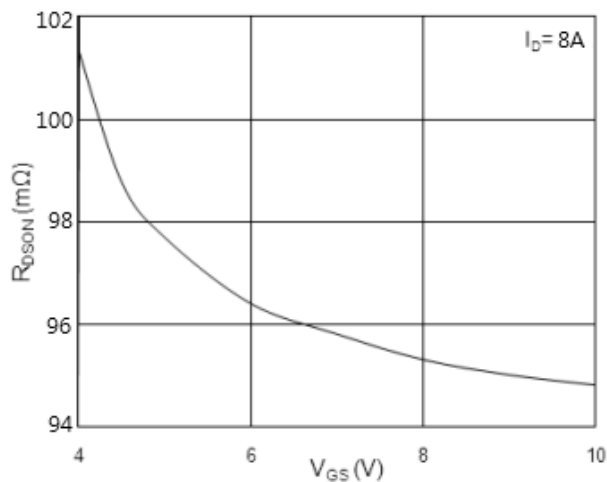
Notes:

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
2. When mounted on minimum pad of copper.
3. The power dissipation is limited by 150°C junction temperature.
4. The data tested by pulsed, pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$

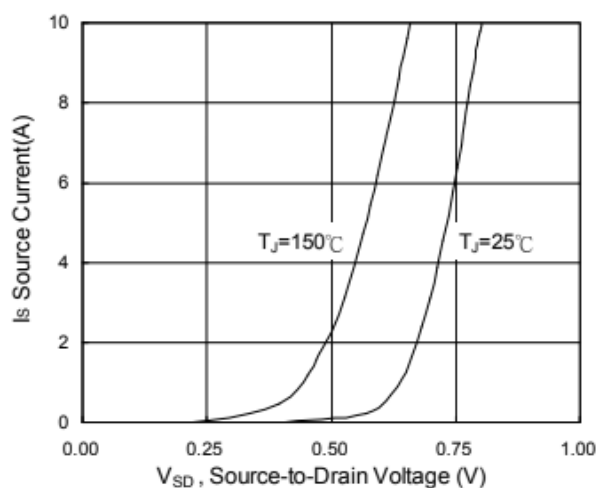
**CHARACTERISTICS CURVE**



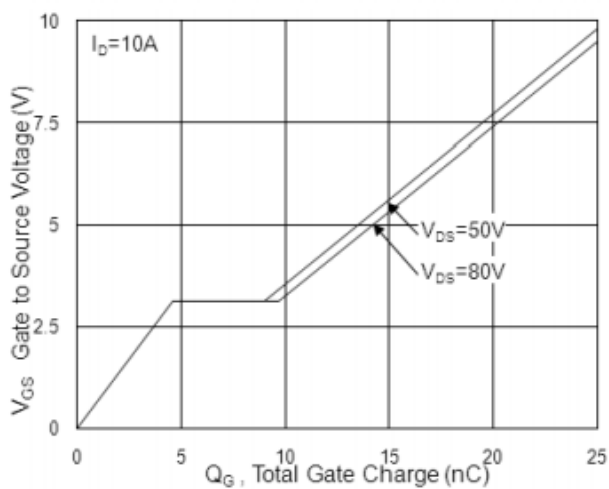
**Fig.1 Typical Output Characteristics**



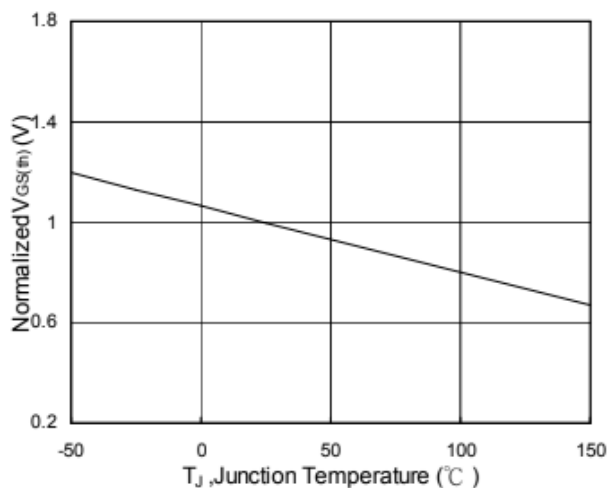
**Fig.2 On-Resistance vs. Gate-Source**



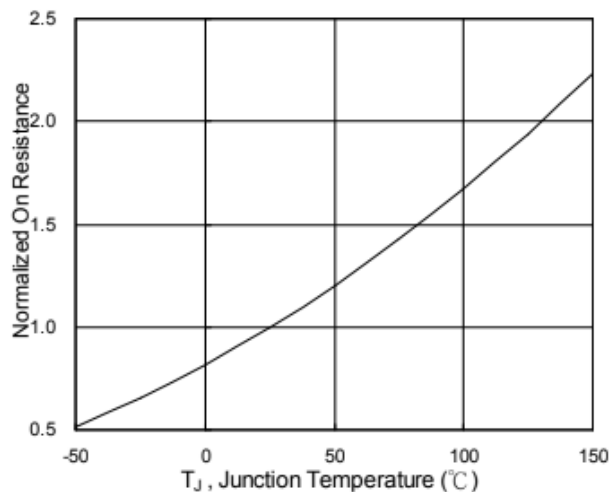
**Fig.3 Forward Characteristics Of Reverse**



**Fig.4 Gate-Charge Characteristics**



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



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

**CHARACTERISTICS CURVE**

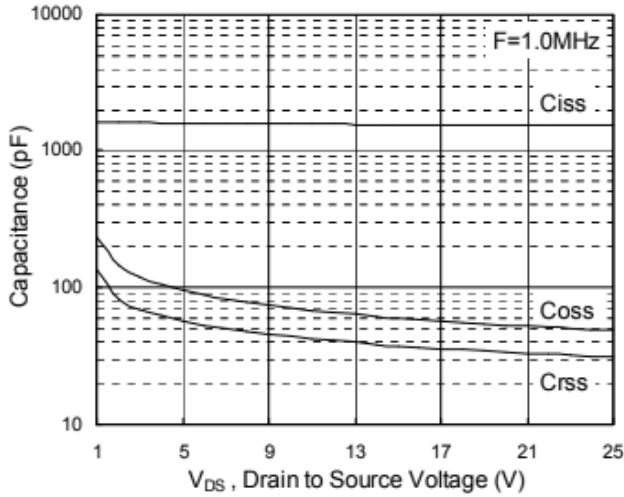


Fig.7 Capacitance

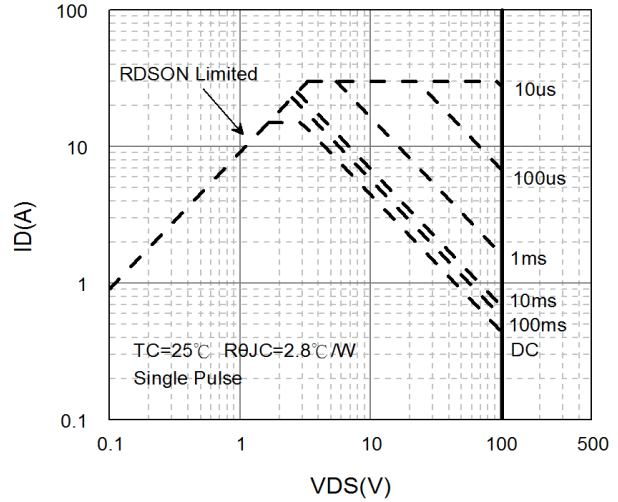


Fig.8 Safe Operating Area

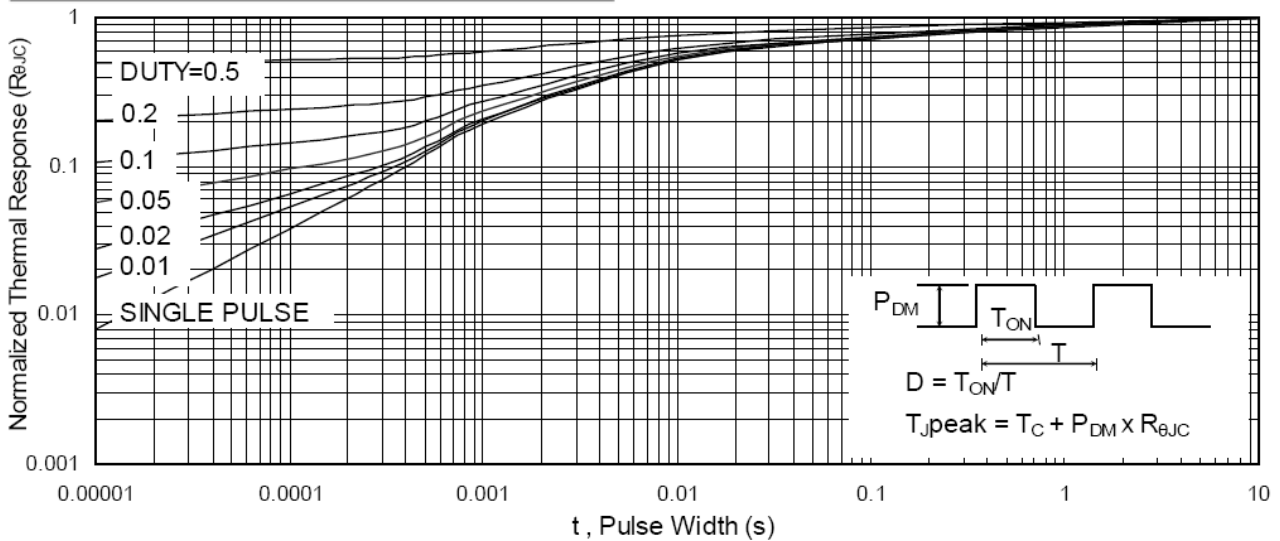


Fig.9 Normalized Maximum Transient Thermal Impedance

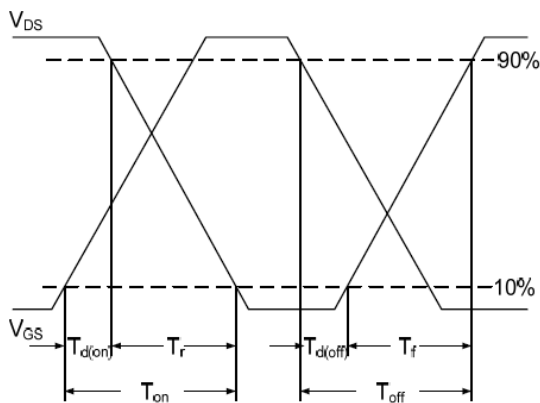


Fig.10 Switching Time Waveform

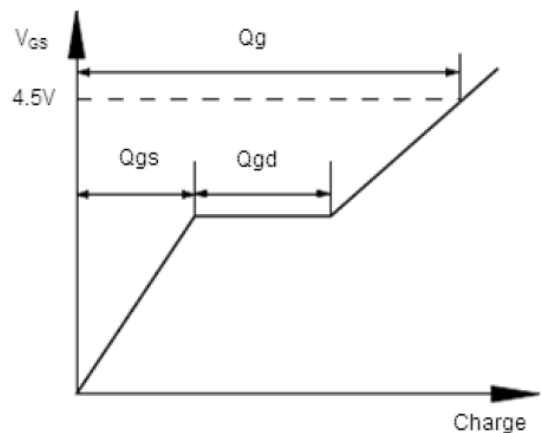


Fig.11 Gate Charge Waveform