

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

## DESCRIPTION

The SSU12N70H-C is power MOSFET using Super Junction Technology that can realize very low on-resistance and gate charge. It will provide much high efficiency by using optimized charge coupling technology. These user friendly devices give an advantage of low EMI to designers as well as low switching loss, which provide excellent  $R_{DS(ON)}$  and gate charge for most of the synchronous buck converter applications.

The SSU12N70H-C meet the RoHS and Green Product requirement with full function reliability approved.

## FEATURES

- Advanced Super Junction Technology
- Super Low Gate Charge
- Green Device Available

## MARKING



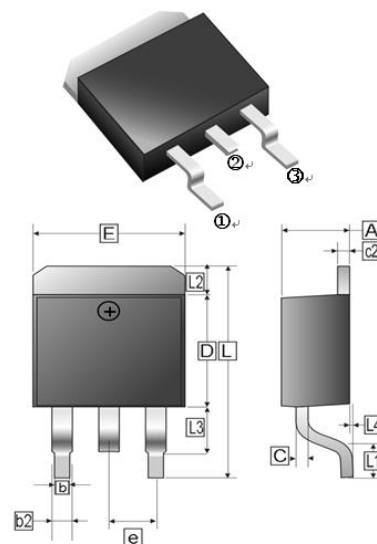
## PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-263	0.8K	13 inch

## ORDER INFORMATION

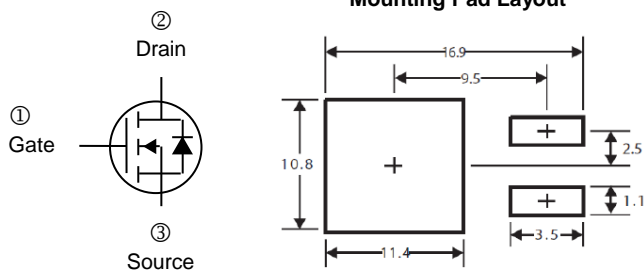
Part Number	Type
SSU12N70H-C	Lead (Pb)-free and Halogen-free

## TO-263



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.00	4.87	c2	1.07	1.65
b	0.51	1.01	b2	1.34	REF
L4	0.00	0.30	D	8.0	9.65
C	0.30	0.74	e	2.54	REF
L3	1.50	REF	L	14.6	16.1
L1	2.5	REF	L2	1.27	REF
E	9.60	10.67			

## Mounting Pad Layout



\*Dimensions in millimeters

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

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	700	V	
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V	
Continuous Drain Current <sup>1,4</sup> @ $V_{GS}=10\text{V}$	$T_C=25^\circ\text{C}$	12	A	
	$T_C=100^\circ\text{C}$	7.6		
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	36	A	
Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	100.8	W
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$	
Thermal Resistance Rating				
Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$	
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	1.24		

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	700	-	-	V	$V_{GS}=0V, I_D=250\mu A$	
Gate-Threshold Voltage	$V_{GS(th)}$	2	-	4	V	$V_{DS}=V_{GS}, I_D=250\mu A$	
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 30V$	
Drain-Source Leakage Current	$I_{DSS}$	$T_J=25^\circ\text{C}$	-	-	1	$\mu A$	$V_{DS}=560V, V_{GS}=0V$
		$T_J=55^\circ\text{C}$	-	-	5		
Static Drain-Source On-Resistance <sup>3</sup>	$R_{DS(ON)}$	-	0.39	0.44	$\Omega$	$V_{GS}=10V, I_D=3.2A$	
Total Gate Charge	$Q_g$	-	34	-	nC	$I_D=12A$ $V_{DS}=480V$ $V_{GS}=10V$	
Gate-Source Charge	$Q_{gs}$	-	6.7	-			
Gate-Drain Charge	$Q_{gd}$	-	15.8	-			
Turn-on Delay Time	$T_{d(on)}$	-	20	-	nS	$V_{DD}=350V$ $I_D=12A$ $V_{GS}=10V$ $R_G=25\Omega$	
Rise Time	$T_r$	-	38	-			
Turn-off Delay Time	$T_{d(off)}$	-	101	-			
Fall Time	$T_f$	-	38	-			
Input Capacitance	$C_{iss}$	-	1061	-	pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1\text{MHz}$	
Output Capacitance	$C_{oss}$	-	823	-			
Reverse Transfer Capacitance	$C_{rss}$	-	50	-			
<b>Source-Drain Diode</b>							
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	-	-	1.4	V	$I_S=10A, V_{GS}=0V$	
Continuous Source Current <sup>1 4</sup>	$I_S$	-	-	12	A	$V_G=V_D=0$ , Force Current	
Pulsed Source Current <sup>2</sup>	$I_{SM}$	-	-	36	A		
Reverse Recovery Time	$T_{rr}$	-	385	-	nS	$V_{DD}=100V, I_F=12A,$ $dI/dt=100A/\mu s$	
Reverse Recovery Charge	$Q_{rr}$	-	4.8	-	$\mu C$		

Notes:

1. Surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2oz copper.
2. Pulse width limited by maximum junction temperature, pulse width  $\leq 10\mu s$ , duty cycle  $\leq 2\%$ .
3. The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
4. Silicon limitation current is 11A.

**CHARACTERISTIC CURVES**

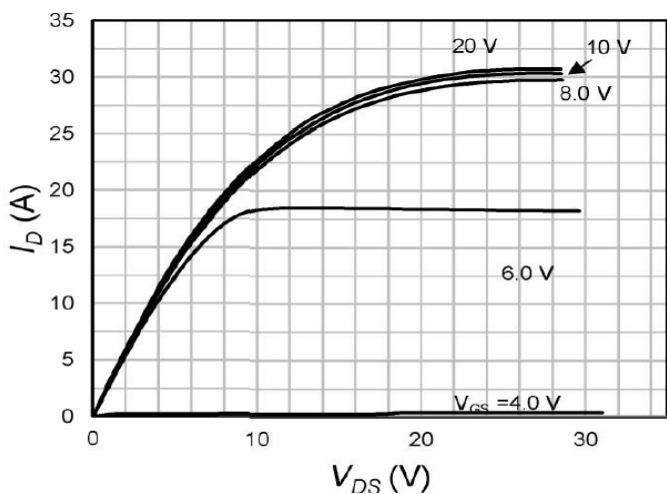


Fig.1 Typical Output Characteristics

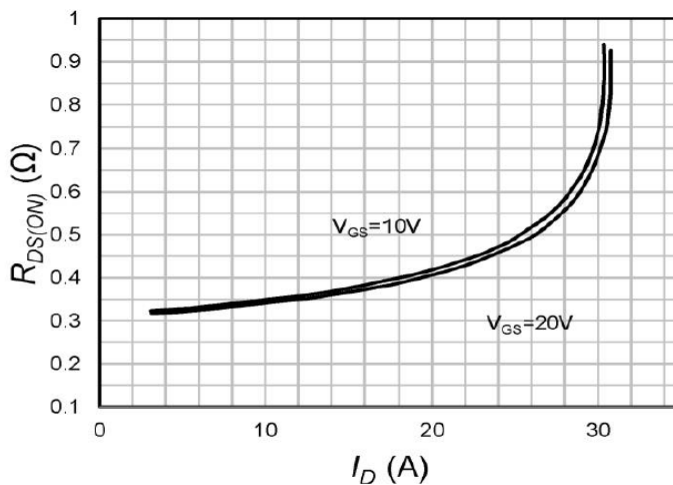


Fig.2 On-Resistance vs. Drain Current

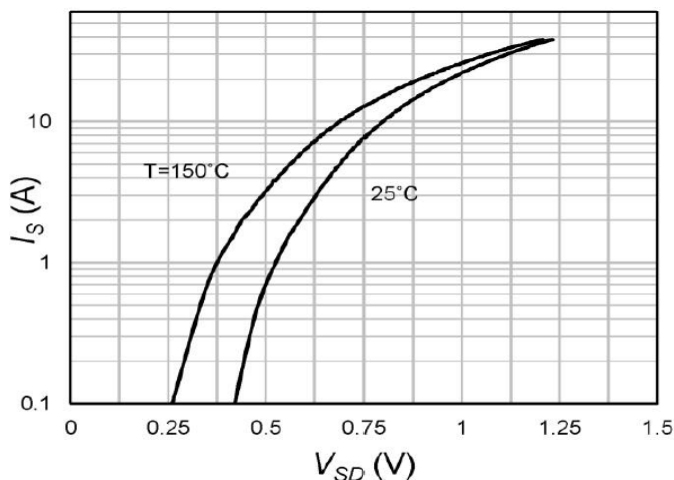


Fig.3 Forward Characteristics of Reverse

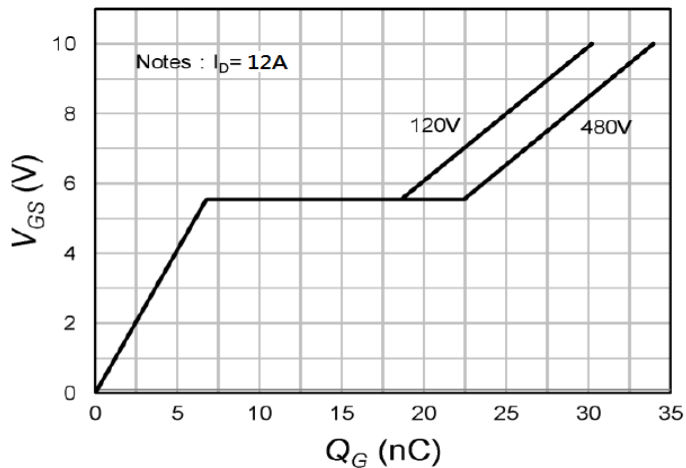


Fig.4 Gate-Charge Characteristics

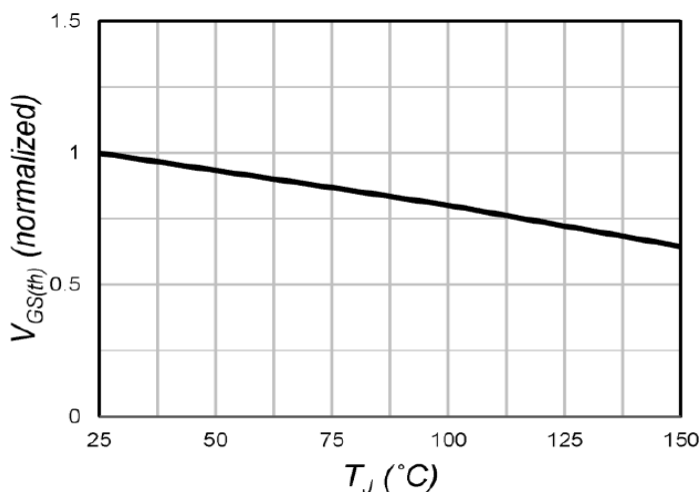


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

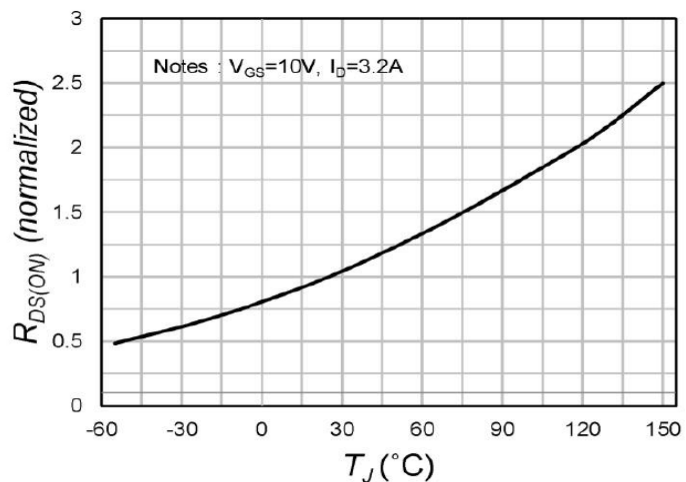


Fig.6 Normalized  $R_{DS(ON)}$  vs.  $T_J$

**CHARACTERISTIC CURVES**

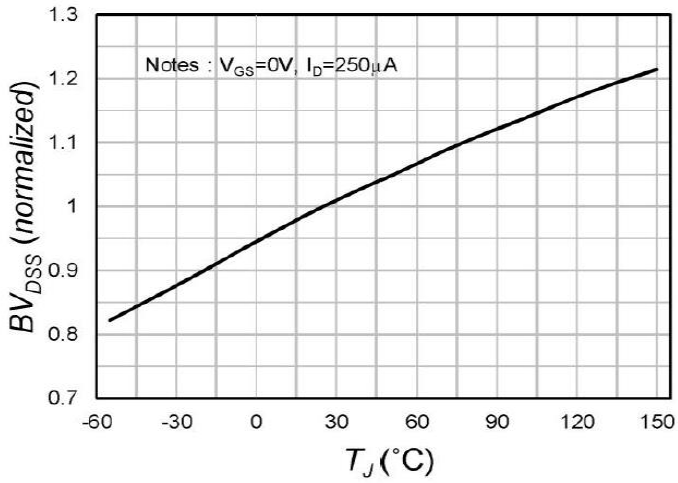


Fig.7 Drain-Source Breakdown Voltage(Normaized)

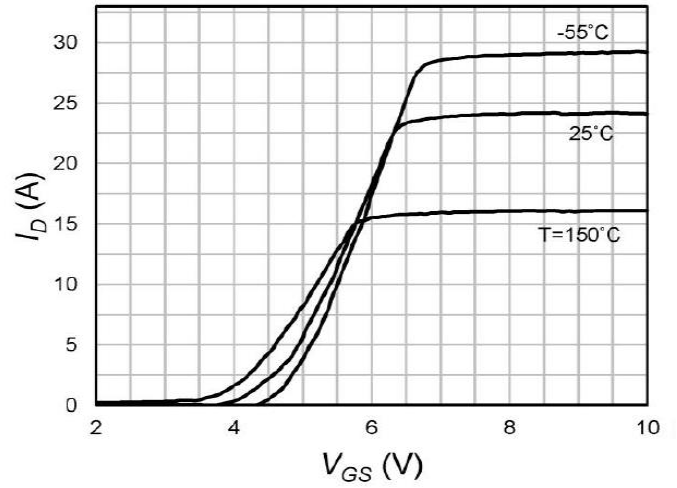


Fig.8 Transfer Characteristics

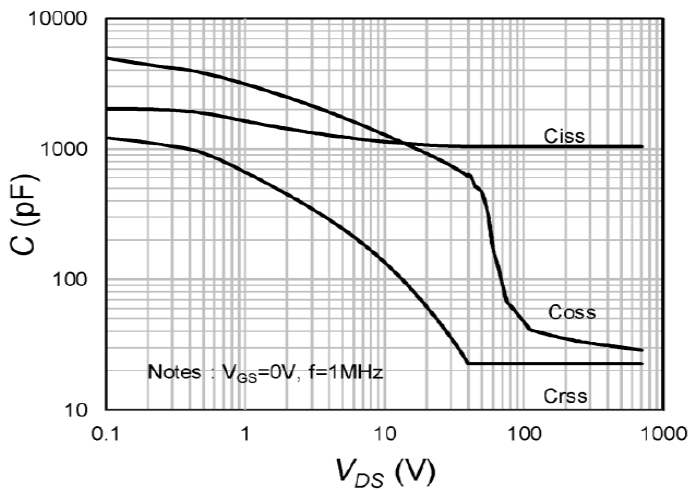


Fig.9 Capacitances

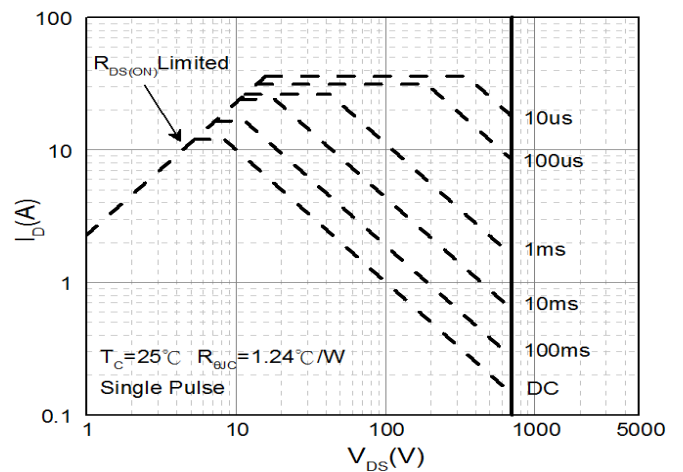


Fig.10 Safe Operating Area

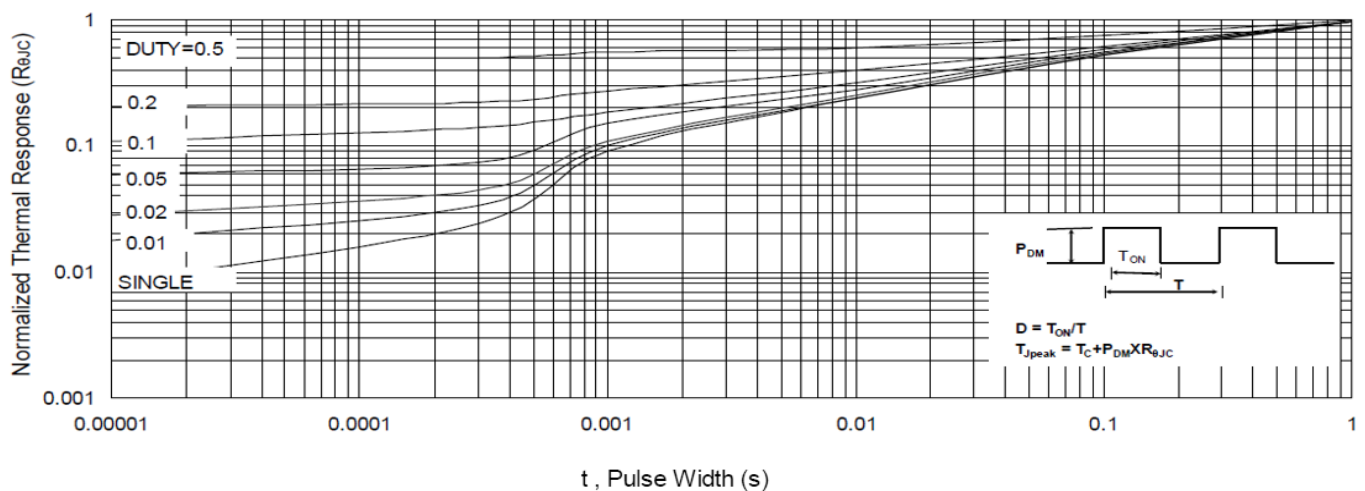


Fig.11 Normalized Maximum Transient Thermal Impedance