

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

## DESCRIPTION

The SSD04N65H-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 SSD04N65H-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



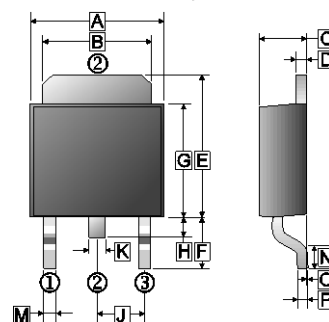
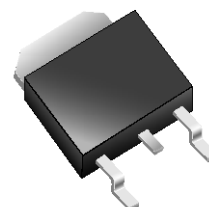
## PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-252	2.5K	13 inch

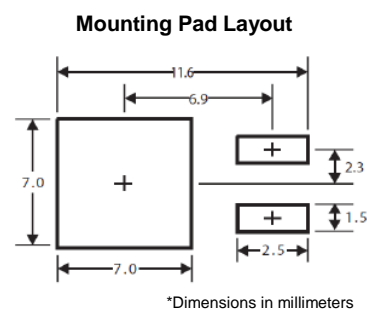
## ORDER INFORMATION

Part Number	Type
SSD04N65H-C	Lead (Pb)-free and Halogen-free

## TO-252(D-Pack)



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.30	6.90	J	2.30 REF.	
B	4.95	5.53	K	0.89 REF.	
C	2.10	2.50	M	0.45	1.14
D	0.40	0.90	N	1.55 TYP.	
E	6.00	7.70	O	0	0.15
F	2.90 REF.		P	0.58 REF.	
G	5.40	6.40			
H	0.60	1.20			



## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	650	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current <sup>1 4</sup> @ $V_{GS}=10V$	$I_D$	$T_C=25^\circ C$	4.4
		$T_C=100^\circ C$	2.8
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	14	A
Total Power Dissipation	$P_D$	34.7	W
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	150, -55~150	$^\circ C$
Thermal Resistance Ratings			
Maximum Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	62	$^\circ C/W$
Maximum Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	3.4	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$BV_{DSS}$	650	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	2	-	4	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 30\text{V}, V_{DS}=0$
Drain-Source Leakage Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=650\text{V}, V_{GS}=0$
Static Drain-Source On-Resistance <sup>3</sup>	$R_{DS(ON)}$	-	0.8	0.9	$\Omega$	$V_{GS}=10\text{V}, I_D=1.5\text{A}$
Gate Resistance	$R_g$	-	20	-	$\Omega$	$V_{GS}=0, f=1\text{MHz}$
Total Gate Charge	$Q_g$	-	11.1	-	nC	$I_D=4.4\text{A}$ $V_{DS}=520\text{V}$ $V_{GS}=10\text{V}$
Gate-Source Charge	$Q_{gs}$	-	4.5	-		
Gate-Drain Charge	$Q_{gd}$	-	2.6	-		
Turn-on Delay Time	$T_{d(on)}$	-	13.5	-	nS	$V_{DS}=325\text{V}$ $I_D=4.4\text{A}$ $V_{GS}=10\text{V}$ $R_G=25\Omega$
Rise Time	$T_r$	-	24	-		
Turn-off Delay Time	$T_{d(off)}$	-	56	-		
Fall Time	$T_f$	-	23.5	-		
Input Capacitance	$C_{iss}$	-	384	-	pF	$V_{GS}=0\text{V}$ $V_{DS}=25\text{V}$ $f=1\text{MHz}$
Output Capacitance	$C_{oss}$	-	439	-		
Reverse Transfer Capacitance	$C_{rss}$	-	19.5	-		
<b>Source-Drain Diode</b>						
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	-	-	1.4	V	$V_{GS}=0, I_S=4.4\text{A}$
Continuous Source Current <sup>1 4</sup>	$I_S$	-	-	4.4	A	
Reverse Recovery Time	$T_{rr}$	-	263	-	nS	$I_S=4.4\text{A}$
Reverse Recovery Charge	$Q_{rr}$	-	1.9	-	$\mu\text{C}$	$di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Current	$I_{rrm}$	-	14.4	-	A	$V_{DD}=100\text{V}$

Notes:

1. Surface Mounted on 1inch<sup>2</sup> FR-4 Board with 2oz copper.
2. Pulse Width limited by maximum junction temperature, pulse width  $\leq 10\mu\text{s}$ , duty cycle  $\leq 2\%$ .
3. The data tested by pulsed, Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
4.  $I_D$  limited by maximum junction temperature.

**TYPICAL CHARACTERISTICS CURVE**

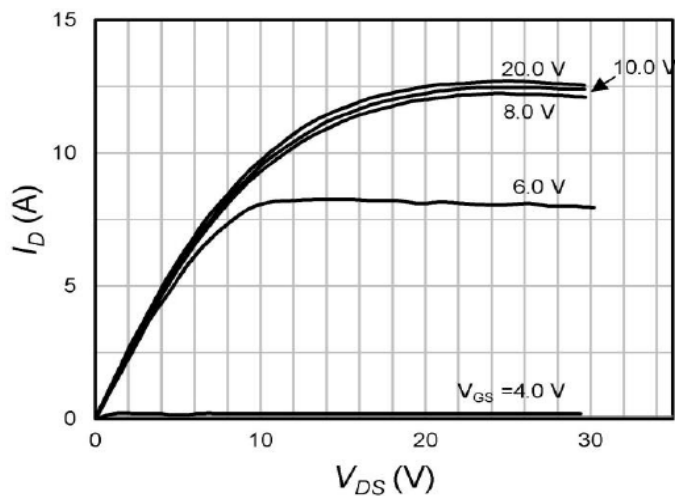


Fig.1 Typical Output Characteristics

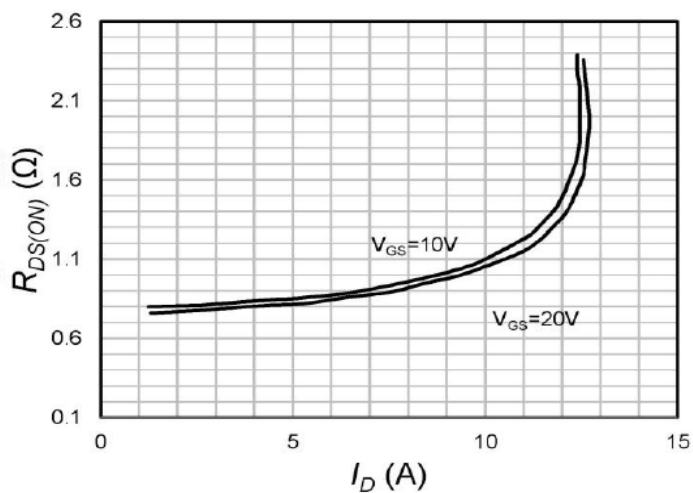


Fig.2 On-Resistance vs. Drain Current

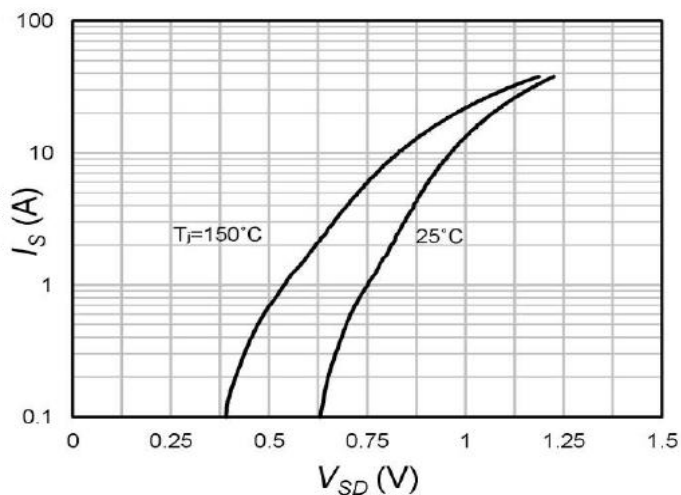


Fig.3 Forward Characteristics of Reverse

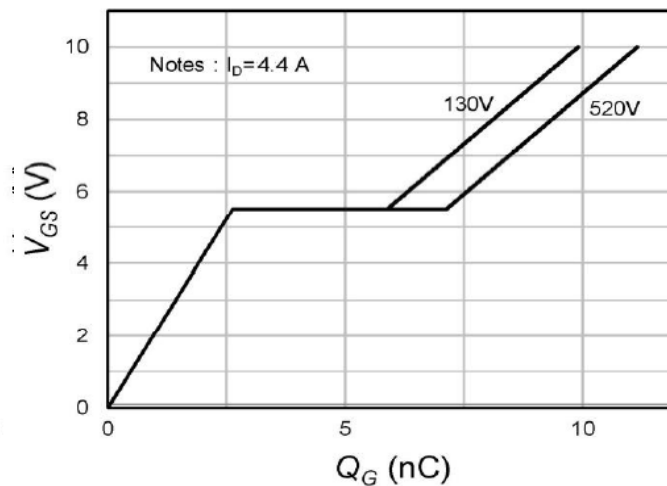


Fig.4 Gate-Charge Characteristics

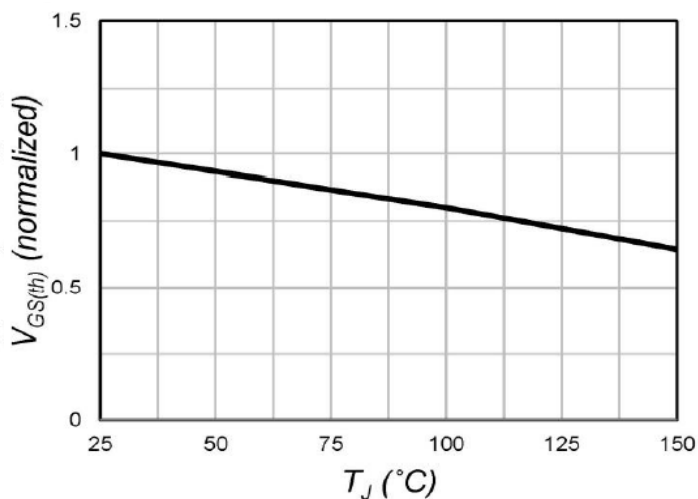


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

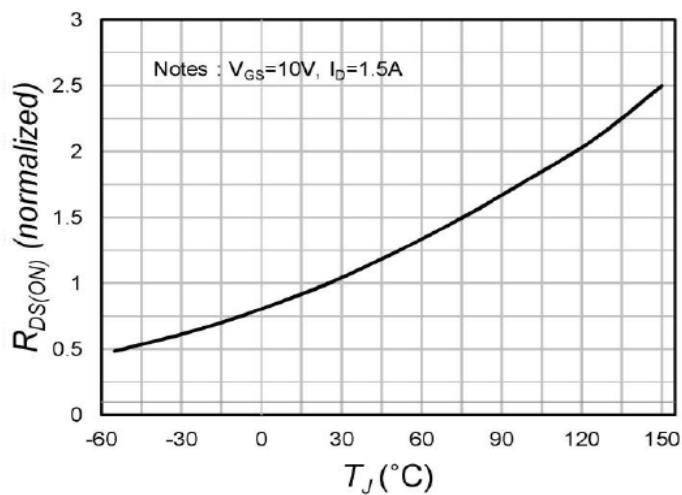


Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$

**TYPICAL CHARACTERISTICS CURVE**

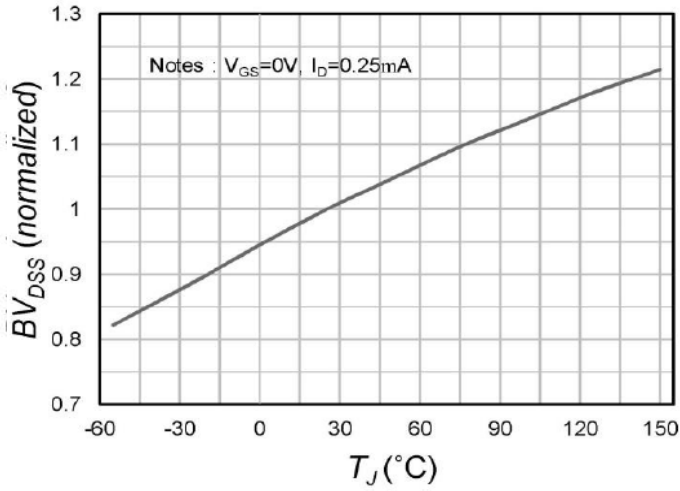


Fig.7 Drain-Source Breakdown Voltage(Normalized)

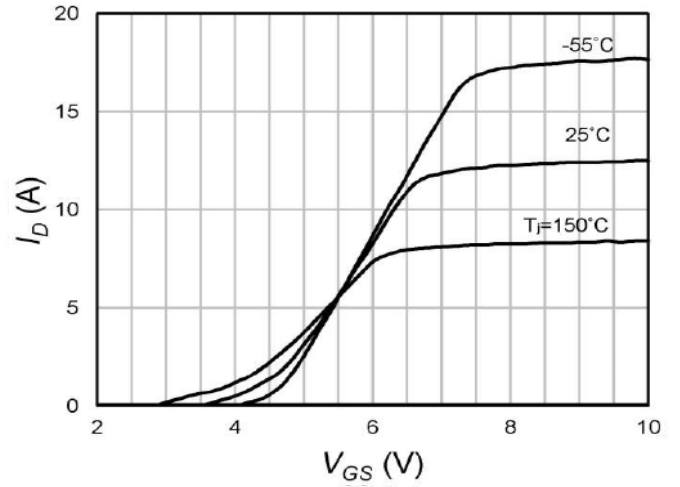


Fig.8 Transfer Characteristics

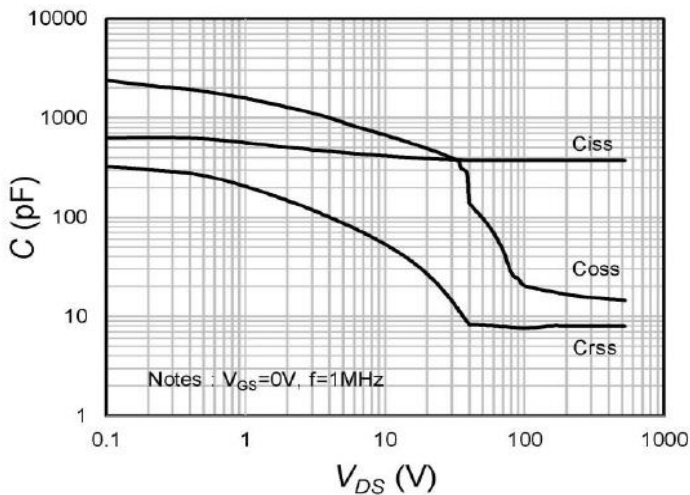


Fig.9 Capacitances

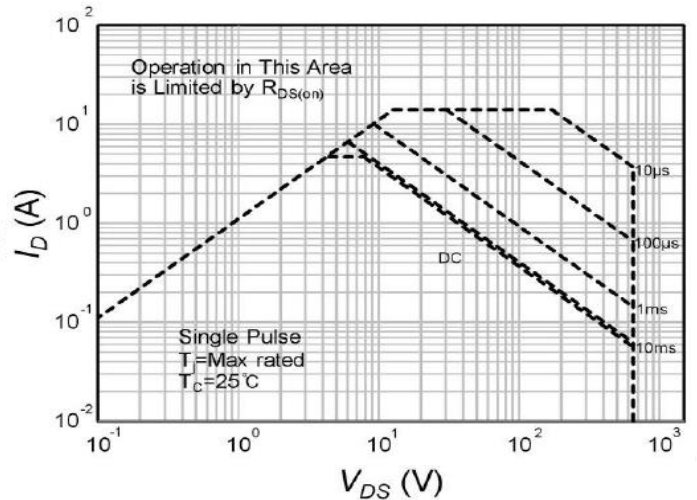


Fig.10 Safe Operating Area

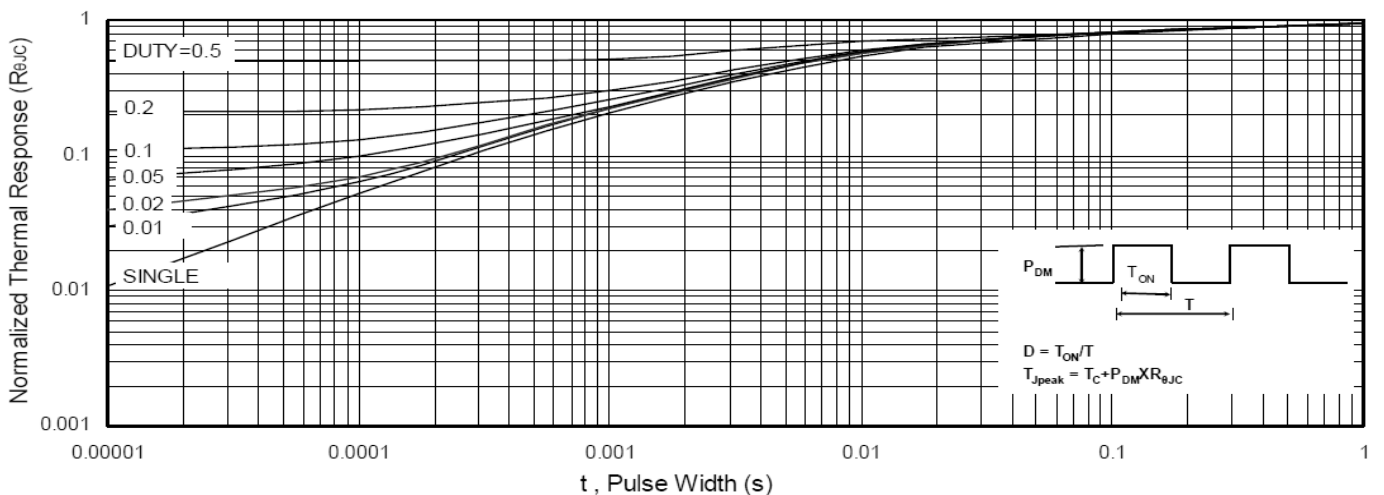


Fig.11 Normalized Maximum Transient Thermal Impedance