Elektronische Bauelemente

SSD42N04-C

42A, 40V, $R_{DS(ON)}$ 12mΩ

N-Ch Enhancement Mode Power MOSFET

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

DESCRIPTION

SSD42N04-C is the highest performance trench N-ch MOSFETs with extreme high cell density, which provides excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

SSD42N04-C meets 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

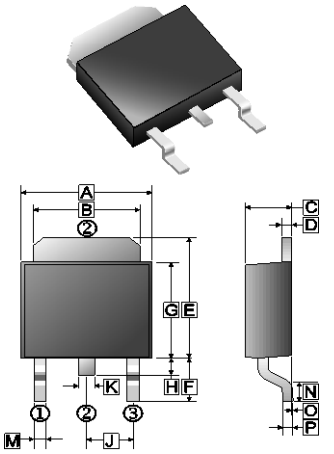
PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-252	2.5K	13 inch

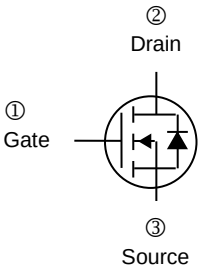
ORDER INFORMATION

Part Number	Type
SSD42N04-C	Lead (Pb)-free and Halogen-free

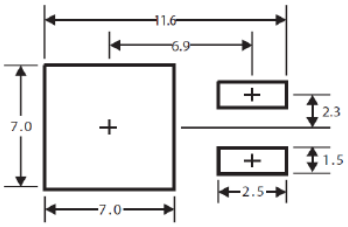
TO-252(D-Pack)



REF.	Millimeter Min.	Millimeter Max.	REF.	Millimeter Min.	Millimeter 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			



Mounting Pad Layout



*Dimensions in millimeters

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1] @V_{GS}=10V	T_C=25°C	I_D	42	A
	T_C=100°C		26	
Pulsed Drain Current [2]		I_{DM}	100	A
Total Power Dissipation [3]	T_C=25°C	P_D	34.7	W
	T_A=25°C		2	
Operating Junction & Storage Temperature		T_J, T_{STG}	-55~150	°C
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	Steady State, 62	°C/W
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	3.6	

ELECTRICAL CHARACTERISTICS (T_J=25°C unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	40	-	-	V	V_{GS}=0V, I_D=250μA
Gate-Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	-	-	1	uA	V_{DS}=32V, V_{GS}=0
	T_J=55°C		-	-	5		V_{DS}=32V, V_{GS}=0
Static Drain-Source On-Resistance [2]		$R_{DS(ON)}$	-	9.5	12	mΩ	V_{GS}=10V, I_D=20A
			-	13.5	17		V_{GS}=4.5V, I_D=10A
Forward Transconductance		g_{fs}	-	36	-	S	V_{DS}=5V, I_D=20A
Gate Resistance		R_g	-	2.1	-	Ω	V_{DS}=V_{GS}=0V, f=1MHz
Total Gate Charge		Q_g	-	10.7	-	nC	I_D=12A V_{DS}=20V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	3.3	-		
Gate-Drain Change		Q_{gd}	-	4.2	-		
Turn-on Delay Time		$T_{d(on)}$	-	8.6	-	nS	V_{DD}=12V I_D=6A V_{GS}=10V R_G=3.3Ω
Rise Time		T_r	-	3.4	-		
Turn-off Delay Time		$T_{d(off)}$	-	25	-		
Fall Time		T_f	-	2.2	-		
Input Capacitance		C_{iss}	-	1314	-	pF	V_{GS}=0V V_{DS}=15V f=1MHz
Output Capacitance		C_{oss}	-	120	-		
Reverse Transfer Capacitance		C_{rss}	-	88	-		
Source-Drain Diode							
Diode Forward Voltage [2]		V_{SD}	-	-	1.2	V	I_S=1A, V_{GS}=0V, T_J=25°C
Continuous Source Current [1]		I_S	-	-	42	A	V_G=V_D=0V, Force Current
Pulsed Source Current [2]		I_{SM}	-	-	100	A	

Notes:
1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. The data tested by pulsed, pulse width≤300us, duty cycle≤2%.
3. Pulse width limited by maximum junction temperature.

CHARACTERISTIC CURVES

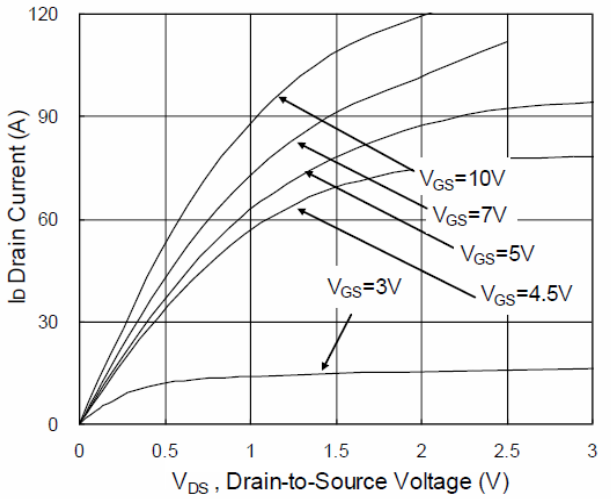


Fig.1 Typical Output Characteristics

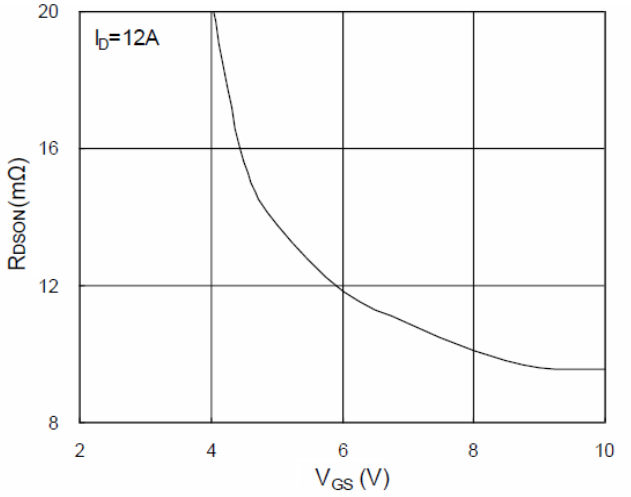


Fig.2 On-Resistance vs. G-S Voltage

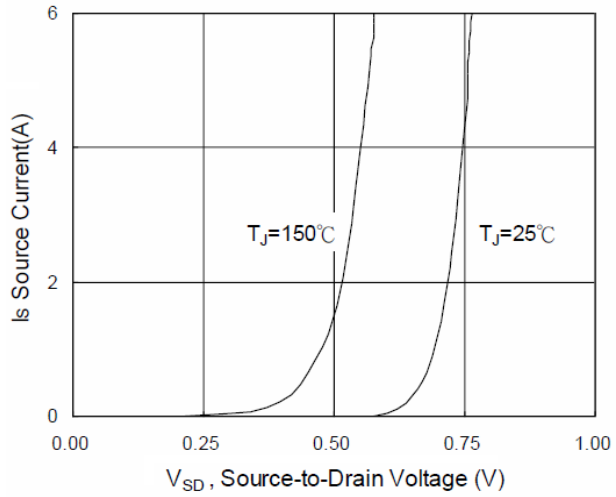


Fig.3 Forward Characteristics of Reverse

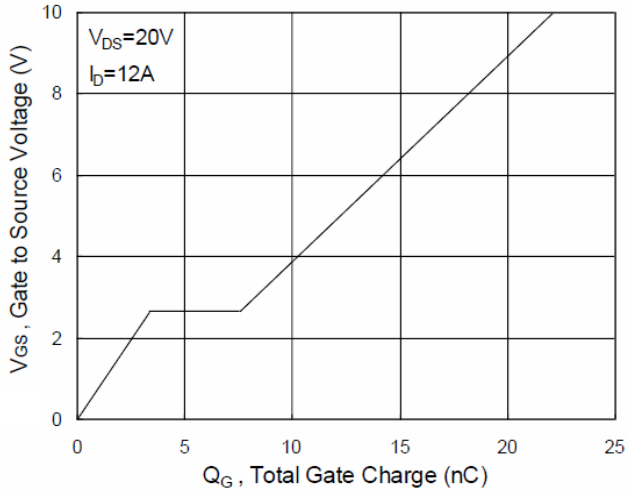


Fig.4 Gate-Charge Characteristics

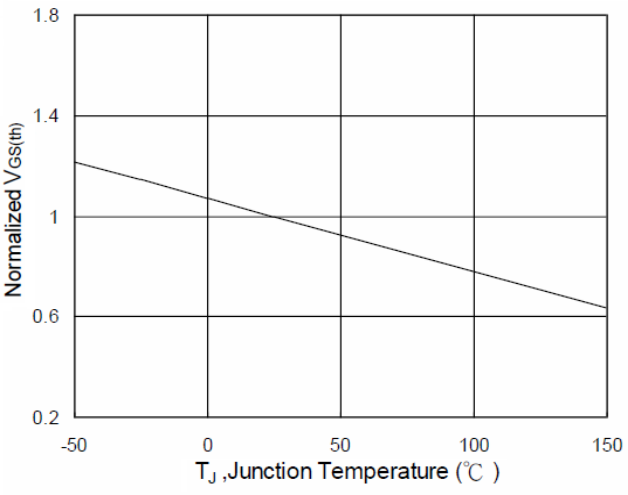


Fig.5 $V_{GS(th)}$ vs. T_J

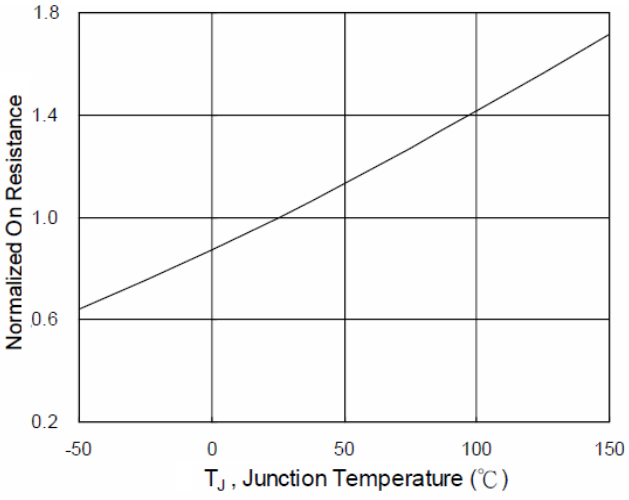


Fig.6 Normalized R_{DSON} vs. T_J

CHARACTERISTIC CURVES

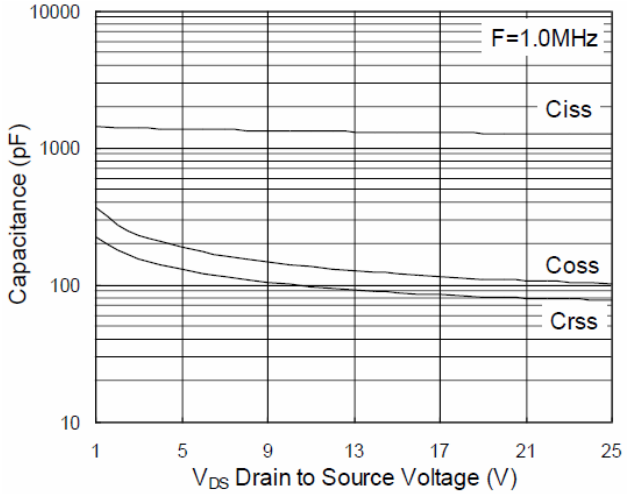


Fig.7 Capacitance

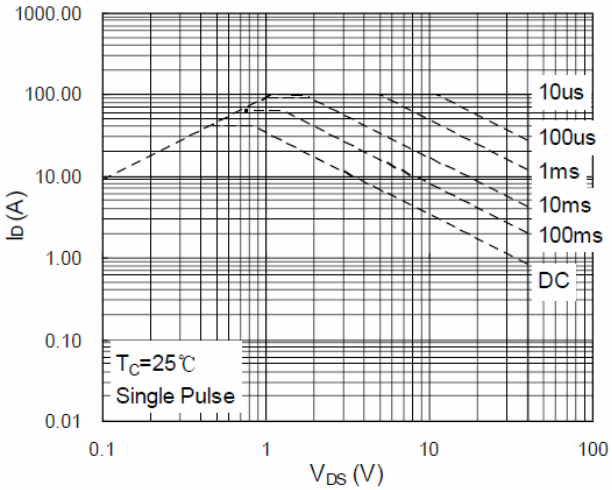


Fig.8 Safe Operating Area

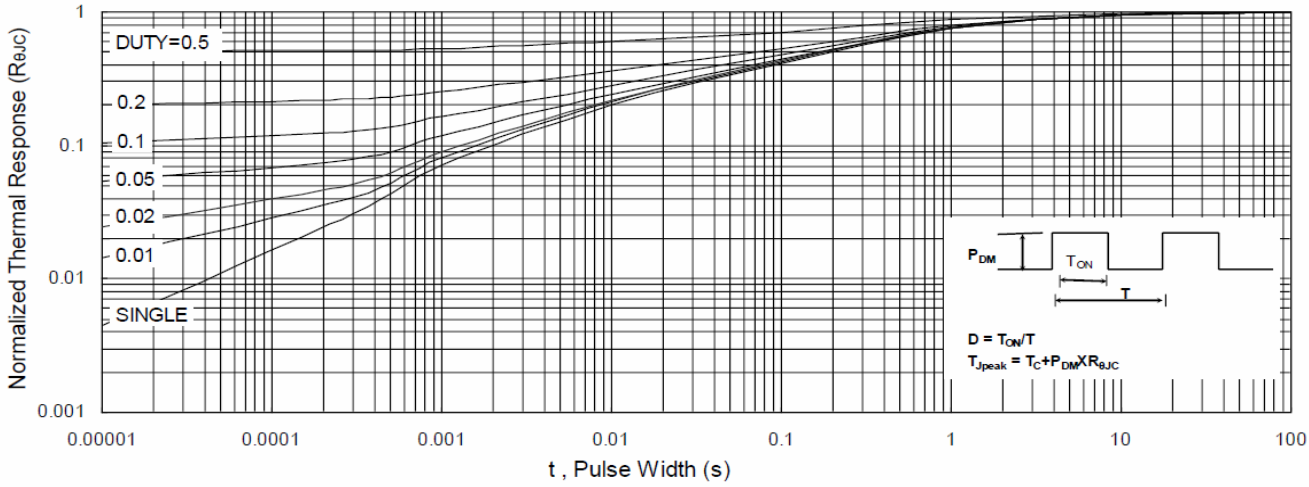


Fig.9 Normalized Maximum Transient Thermal Impedance

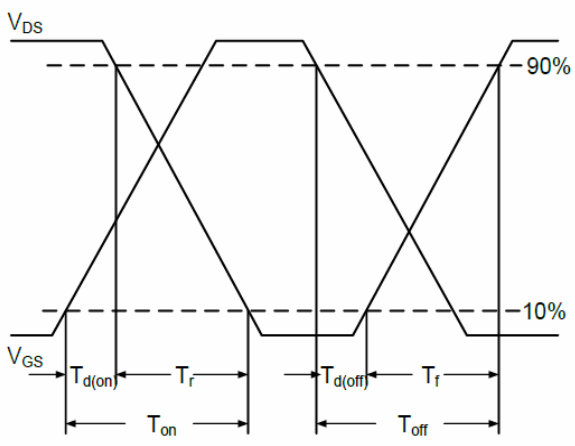


Fig.10 Switching Time Waveform

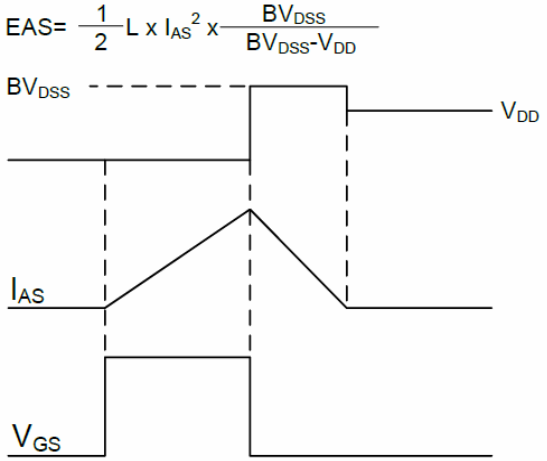


Fig.11 Unclamped Inductive Switching Waveform