Elektronische Bauelemente

SSD56N04-C

56A , 40V , $R_{DS(ON)}$ 8.5mΩ

N-Ch Enhancement Mode Power MOSFET

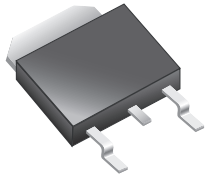
RoHS Compliant Product
A suffix of "-C" specifies halogen free

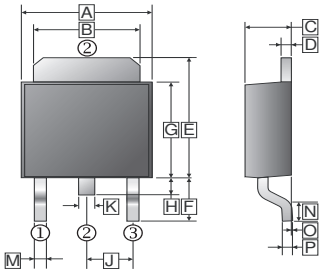
DESCRIPTION

The SSD56N04-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 SSD56N04-C meet the RoHS and Green Product requirement with full function reliability approved.

TO-252(D-Pack)



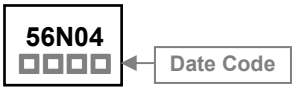


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.3	6.9	J	2.3 REF.	
B	4.95	5.53	K	0.89 REF.	
C	2.1	2.5	M	0.45	1.14
D	0.4	0.9	N	1.55 Typ.	
E	6	7.7	O	0	0.15
F	2.90 REF		P	0.58 REF.	
G	5.4	6.4			
H	0.6	1.2			

FEATURES

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

MARKING

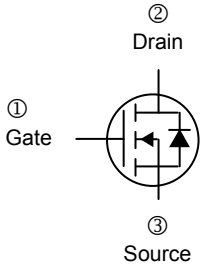


PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-252	2.5K	13 inch

ORDER INFORMATION

Part Number	Type
SSD56N04-C	Lead (Pb)-free and Halogen-free



ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current, @V_{GS}=10V [1]	T_C=25°C	I_D	56	A
	T_C=100°C		42	
	T_A=25°C		12	
	T_A=70°C		9.6	
Pulsed Drain Current [3]		I_{DM}	110	A
Total Power Dissipation	T_C=25°C	P_D	44.6	W
	T_A=25°C		2	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150	°C
Thermal Resistance Rating				
Maximum Thermal Resistance Junction-ambient [1]		$R_{\theta JA}$	62.5	°C/W
Maximum Thermal Resistance Junction-ambient [2]			110	
Maximum Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	2.8	

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV_{DSS}	40	-	-	V	V_{GS}=0, I_D=250μA
Gate-Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Forward Transconductance		g_{fS}	-	39	-	S	V_{DS}=5V, I_D=12A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	-	-	1	μA	V_{DS}=32V, V_{GS}=0
	T_J=55°C		-	-	5		
Static Drain-Source On-Resistance [4]		$R_{DS(ON)}$	-	-	8.5	mΩ	V_{GS}=10V, I_D=12A
			-	-	10		V_{GS}=4.5V, I_D=10A
Total Gate Charge		Q_g	-	18.8	-	nC	I_D=12A V_{DS}=20V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	4.7	-		
Gate-Drain (“Miller”) Change		Q_{gd}	-	8.2	-		
Turn-on Delay Time		$T_{d(on)}$	-	14.3	-	nS	V_{DD}=15V I_D=1A V_{GS}=10V R_D=3.3 Ω
Rise Time		T_r	-	2.6	-		
Turn-off Delay Time		$T_{d(off)}$	-	77	-		
Fall Time		T_f	-	4.8	-		
Input Capacitance		C_{iss}	-	2332	-	pF	V_{GS} =0 V_{DS}=15V f =1.0MHz
Output Capacitance		C_{oss}	-	193	-		
Reverse Transfer Capacitance		C_{rss}	-	138	-		
Source-Drain Diode							
Continuous Source Current [1]		I_S	-	-	56	A	
Pulsed Source Current [3]		I_{SM}	-	-	110		
Diode Forward Voltage [4]		V_{SD}	-	-	1.2	V	I_S=1A, V_{GS}=0

Notes:
1. Surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2. When mounted on Min. copper pad.
3. Pulse width limited by maximum junction temperature, pulse width ≦ 300us , duty cycle ≦ 2%.
4. The data tested by pulsed, pulse width ≦ 300us, duty cycle ≦ 2%.

CHARACTERISTIC CURVES

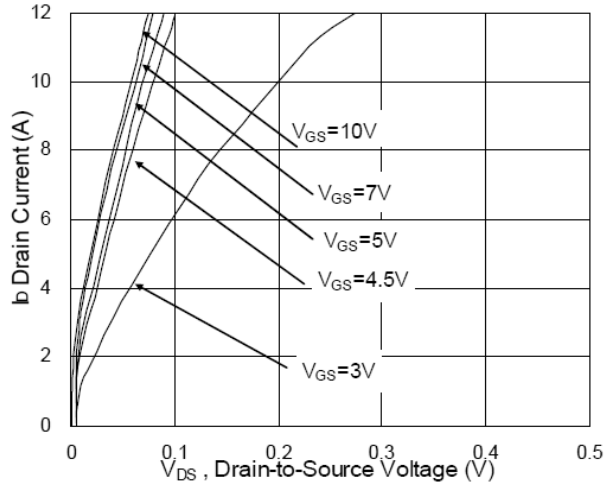


Fig.1 Typical Output Characteristics

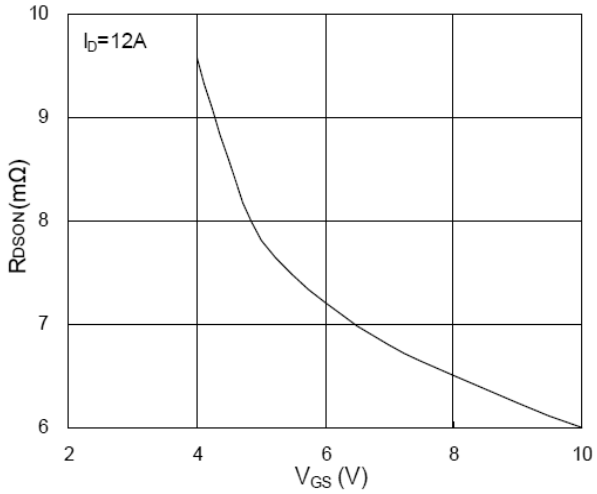


Fig.2 On-Resistance vs. G-S Voltage

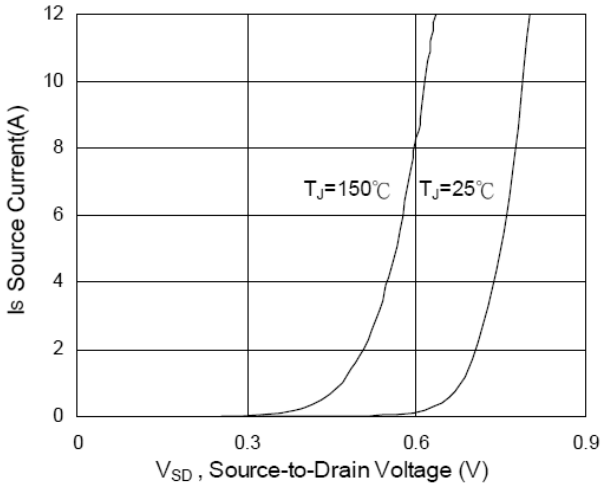


Fig.3 Forward Characteristics of Reverse

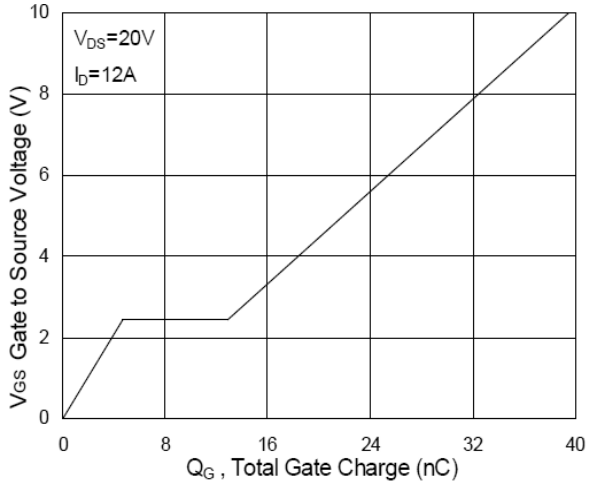


Fig.4 Gate-Charge Characteristics

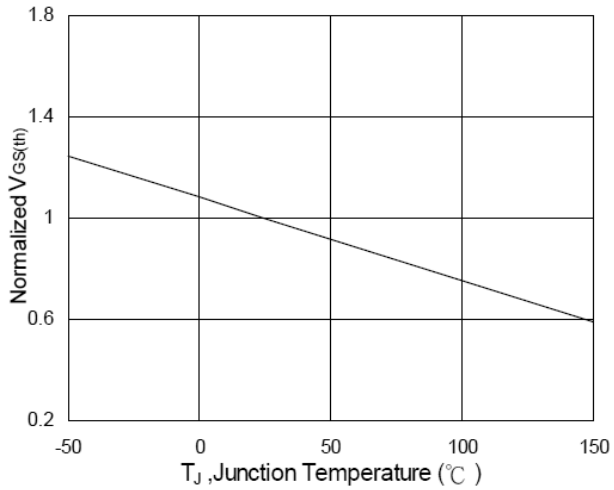


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

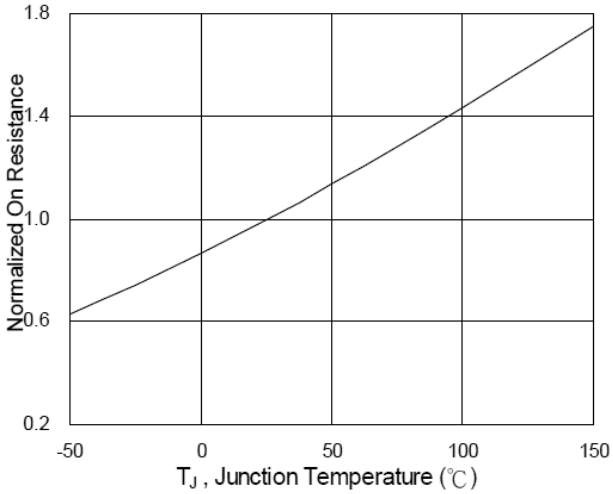


Fig.6 Normalized R_{DSON} vs. T_J

CHARACTERISTIC CURVES

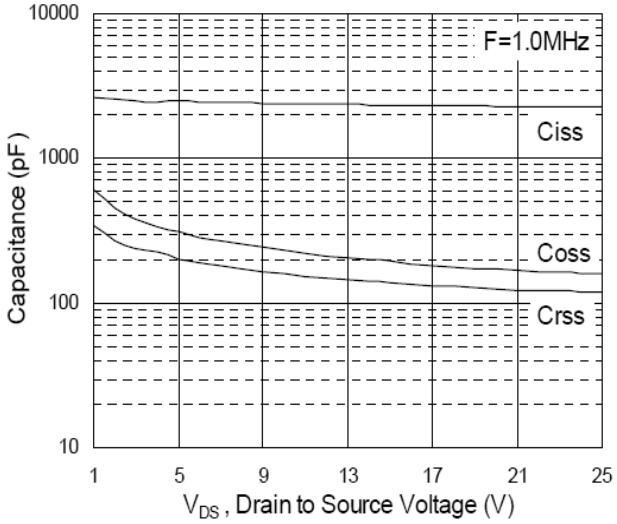


Fig.7 Capacitance

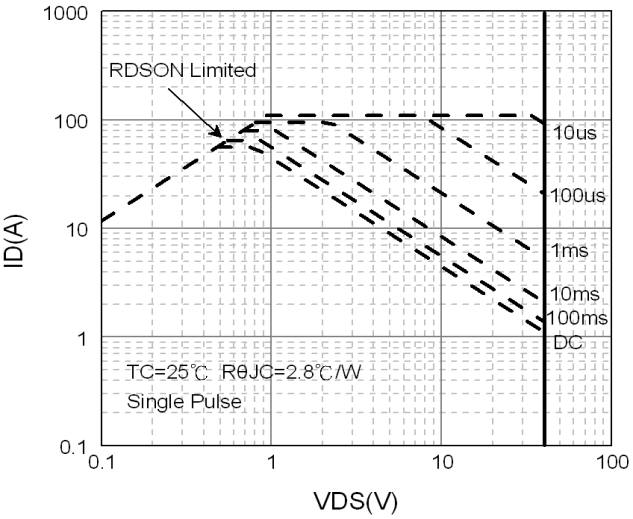


Fig.8 Safe Operating Area

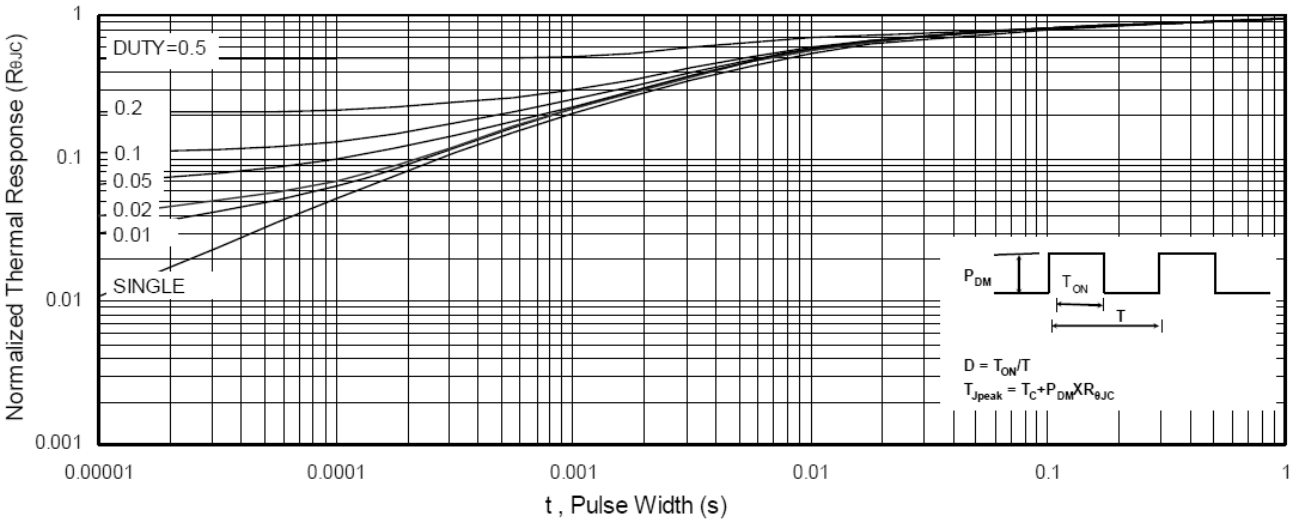


Fig.9 Normalized Maximum Transient Thermal Impedance

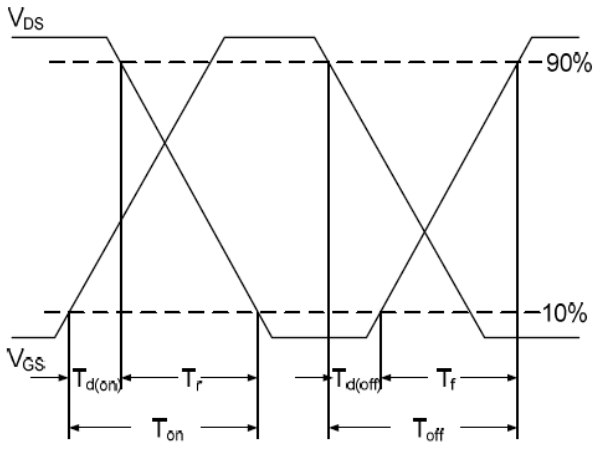


Fig.10 Switching Time Waveform

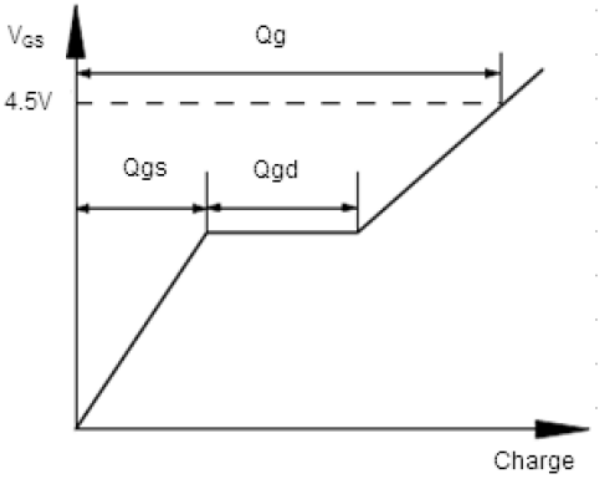


Fig.11 Gate Charge Waveform