Elektronische Bauelemente

SSD9971-C

25A, 60V, $R_{DS(ON)}$ 36mΩ
N-Ch Enhancement Mode Power MOSFET

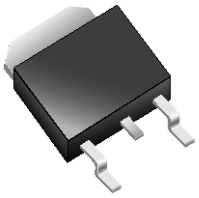
RoHS Compliant Product
A suffix of "-C" specifies halogen free

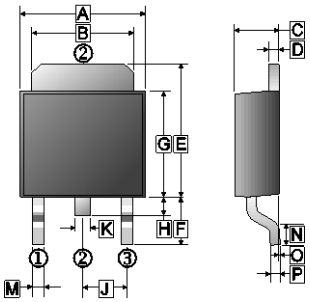
DESCRIPTION

The SSD9971-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 SSD9971-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	6.30	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			

FEATURES

- Advanced High Cell Density Trench Technology
- Super Low Gate Charge
- Green Device Available

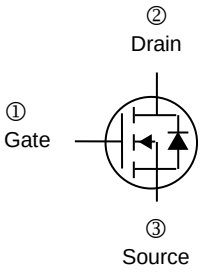
MARKING

PACKAGE INFORMATION

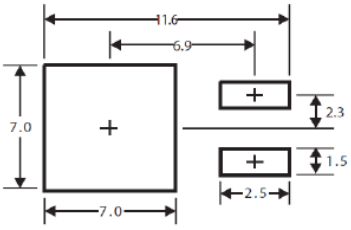
Package	MPQ	Leader Size
TO-252	2.5K	13 inch

ORDER INFORMATION

Part Number	Type
SSD9971-C	Lead (Pb)-free and Halogen-free



Mounting Pad Layout



*Dimensions in millimeters

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current @V_{GS}=10V [1]	T_C=25°C	I_D	25	A
	T_C=100°C		16	
Pulsed Drain Current [2]		I_{DM}	50	A
Total Power Dissipation [1]	T_C=25°C	P_D	39	W
	T_A=25°C		2	
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	°C
Thermal Resistance Rating				
Maximum Thermal Resistance from Junction-Ambient [1]		$R_{\theta JA}$	62.5	°C/W
Maximum Thermal Resistance from Junction-Ambient			110	
Maximum Thermal Resistance from Junction-Case [1]		$R_{\theta JC}$	3.2	

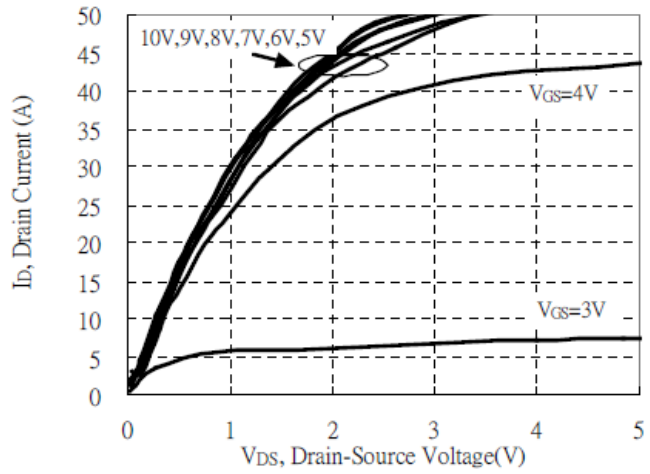
ELECTRICAL CHARACTERISTICS (T_J=25°C unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage		B_{VDSS}	60	-	-	V	V_{GS}=0V, I_D=250μA
Gate-Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	-	-	1	μA	V_{DS}=48V, V_{GS}=0V
	T_J=125°C		-	-	25		
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V, V_{DS}=0V
Forward Transfer conductance		g_{fs}	-	10	-	S	V_{DS}=10V, I_D=18A
Static Drain-Source On-Resistance [3]		$R_{DS(ON)}$	-	27	36	mΩ	V_{GS}=10V, I_D=18A
			-	29	45		V_{GS}=4.5V, I_D=12A
Total Gate Charge @V_{GS}=4.5V		Q_g	-	11.5	-	nC	V_{DS}=48V V_{GS}=10V I_D=18A
Total Gate Charge		Q_g	-	24	-		
Gate-Source Charge		Q_{gs}	-	4.7	-		
Gate-Drain (“Miller”) Charge		Q_{gd}	-	4.1	-		
Turn-on Delay Time		$T_{d(on)}$	-	5.2	-	nS	V_{DD}=30V I_D=18A V_{GS}=10V R_G=3.3Ω R_L=1.67Ω
Turn-on Rise Time		T_r	-	33.6	-		
Turn-off Delay Time		$T_{d(off)}$	-	18.4	-		
Turn-off Fall Time		T_f	-	42.4	-		
Input Capacitance		C_{iss}	-	1316	-	pF	V_{DS}=30V V_{GS}=0V f=1MHz
Output Capacitance		C_{oss}	-	58	-		
Reverse Transfer Capacitance		C_{rss}	-	12	-		
Source-Drain Diode							
Diode Forward Voltage [3]		V_{SD}	-	-	1.2	V	I_S=25A, V_{GS}=0
Continuous Source Current [1]		I_S	-	-	25	A	
Pulsed Source Current [2]		I_{SM}	-	-	50		
Reverse Recovery Time		T_{rr}	-	37	-	nS	I_S=18A, dI/dt=100A/μs T_J=25°C
Reverse Recovery Charge		Q_{rr}	-	38	-	nC	

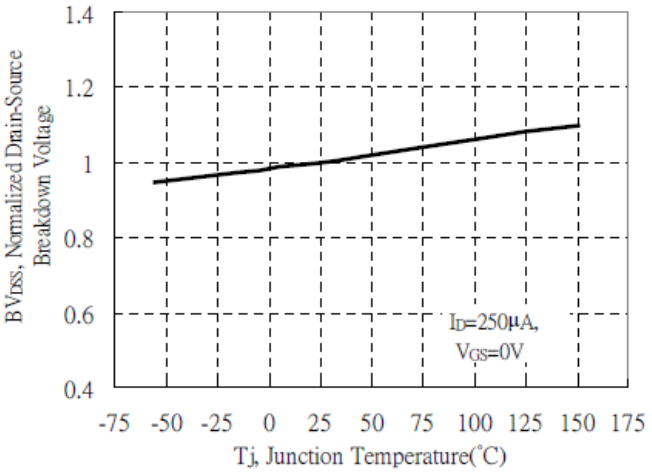
Notes:
1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. The power dissipation is limited by 150°C junction temperature.
3. The data tested by pulsed, pulse width≦ 300us, duty cycle≦ 2%.

CHARACTERISTIC CURVES

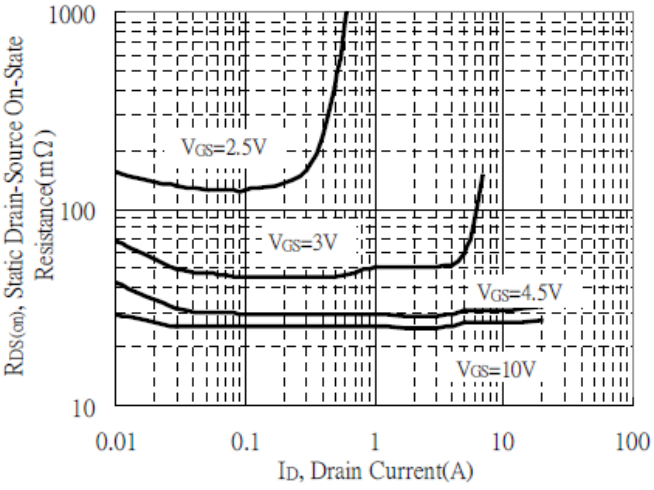
Typical Output Characteristics



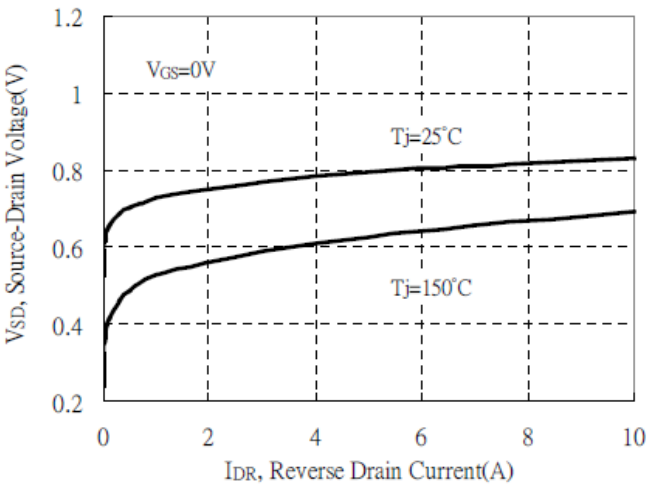
Brekdown Voltage vs Ambient Temperature



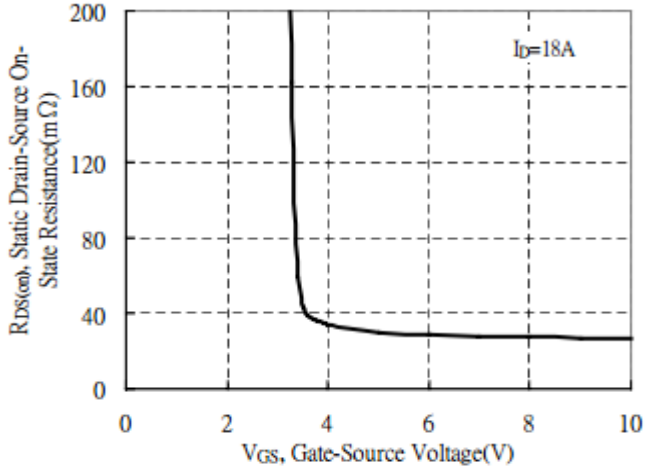
Static Drain-Source On-State resistance vs Drain Current



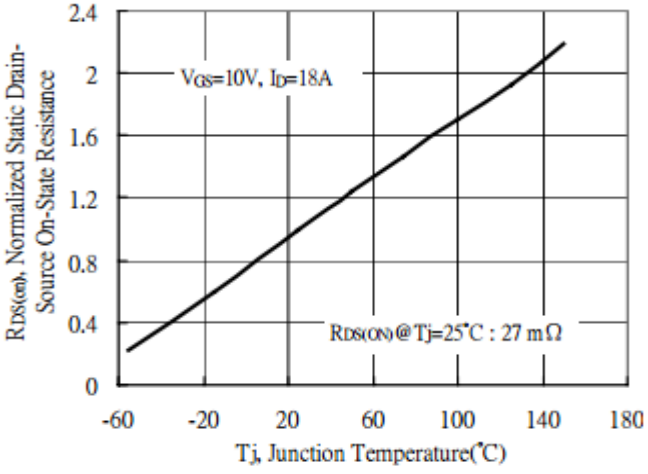
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

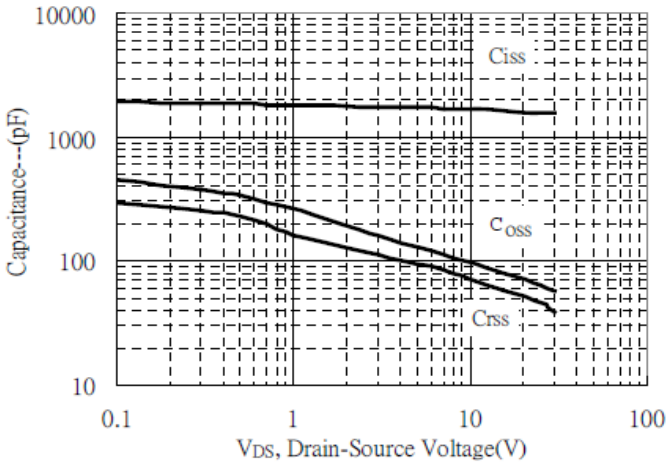


Drain-Source On-State Resistance vs Junction Tempearture

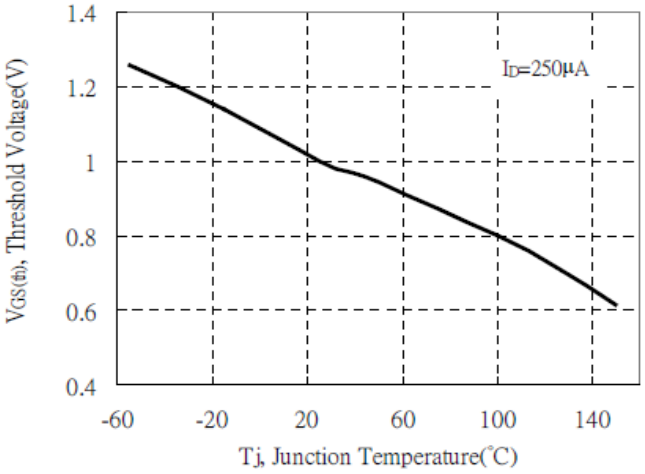


CHARACTERISTIC CURVES

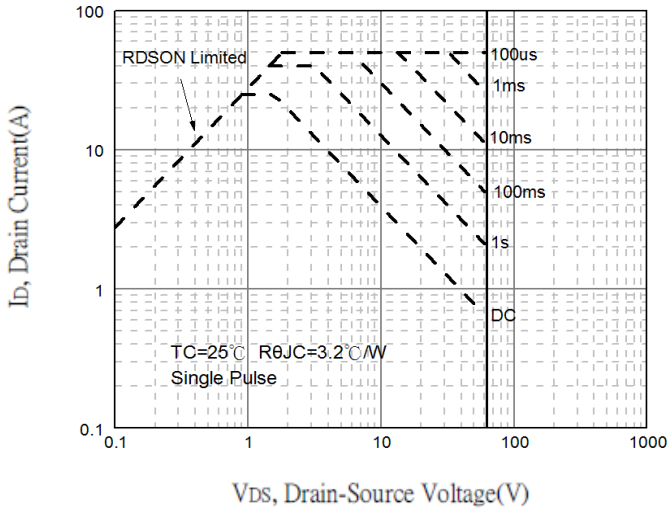
Capacitance vs Drain-to-Source Voltage



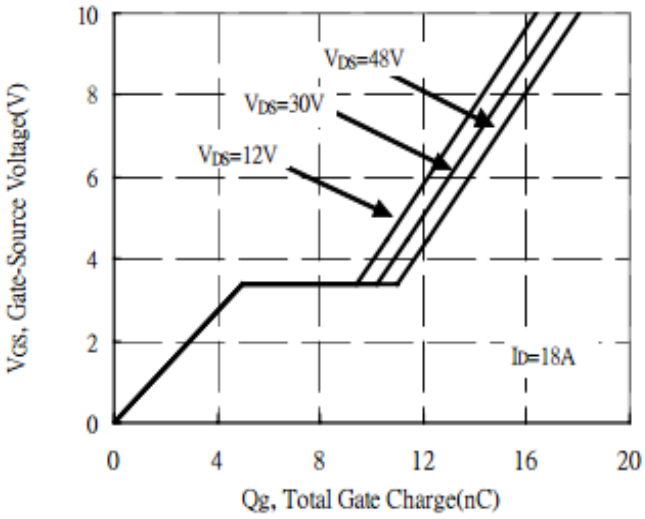
Threshold Voltage vs Junction Tempearture



Maximum Safe Operating Area



Gate Charge Characteristics



Transient Thermal Response Curves