

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

DESCRIPTION

The SSD114N45SG 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 SSD114N45SG meet the RoHS and Green Product with Function reliability approved.

FEATURES

- $R_{DS(on)} \leq 4.5m\Omega @ V_{GS}=10V$
- $R_{DS(on)} \leq 7m\Omega @ V_{GS}=4.5V$
- Optimized for high speed switching, Logic Level
- Enhanced Body diode dv/dt capability
- Enhanced Avalanche Ruggedness
- 100% UIS Tested, 100% Rg Tested
- TO-252 Package

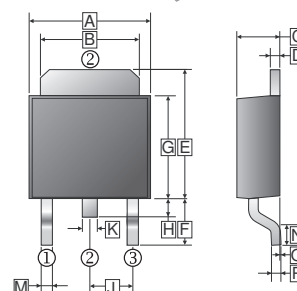
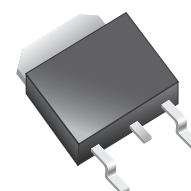
MARKING



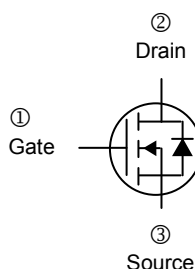
PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-252	2.5K	13 inch

TO-252(D-Pack)



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.35	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	0.41	0.9	N	1.55	Typ.
E	6	7.5	O	0	0.13
F	2.90	REF.	P	0.58	REF.
G	5.4	6.4			
H	0.6	1.2			



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	45	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Silicon Limited)	I_D	$T_C=25^\circ\text{C}$	114
		$T_C=100^\circ\text{C}$	80
Continuous Drain Current (Package Limited)	$T_C=25^\circ\text{C}$	70	A
Pulsed Drain Current	I_{DM}	300	A
Avalanche Energy, Single Pulse, @L=0.3mH	E_{AS}	60	mJ
Power Dissipation	P_D	125	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ 175	$^\circ\text{C}$
Thermal Resistance Ratings			
Maximum Thermal Resistance Junction-Ambient	$R_{\theta JA}$	50	$^\circ\text{C} / \text{W}$
Maximum Thermal Resistance Junction-Case	$R_{\theta JC}$	1.2	

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}	45	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$	
Gate Threshold Voltage	$V_{GS(th)}$	1	1.8	2.2	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	
Forward Transfer conductance	g_{fs}	-	40	-	S	$V_{DS}=5\text{V}, I_D=20\text{A}$	
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20\text{V}$	
Drain-Source Leakage Current	I_{DSS}	$T_J=25^\circ\text{C}$	-	-	1	μA	$V_{DS}=45\text{V}, V_{GS}=0$
		$T_J=100^\circ\text{C}$	-	-	100		
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	3.5	4.5	m Ω	$V_{GS}=10\text{V}, I_D=20\text{A}$	
		-	4.6	7		$V_{GS}=4.5\text{V}, I_D=20\text{A}$	
Total Gate Charge	Q_g	-	42	-	nC	$V_{GS}=10\text{V}$	
		-	22	-		$V_{GS}=4.5\text{V}$	
Gate-Source Charge	Q_{gs}	-	4	-		$I_D=20\text{A}$	
Gate-Drain ("Miller") Change	Q_{gd}	-	10	-	$V_{DD}=20\text{V}$ $V_{GS}=10\text{V}$		
Turn-on Delay Time	$T_{d(on)}$	-	12	-	nS	$V_{DD}=20\text{V}$ $I_D=20\text{A}$ $V_{GS}=10\text{V}$ $R_G=10\Omega$	
Rise Time	T_r	-	10	-			
Turn-off Delay Time	$T_{d(off)}$	-	41	-			
Fall Time	T_f	-	16	-			
Input Capacitance	C_{iss}	-	2159	-	pF	$V_{GS}=0$ $V_{DS}=20\text{V}$ $f=1.0\text{MHz}$	
Output Capacitance	C_{oss}	-	756	-			
Reverse Transfer Capacitance	C_{rss}	-	118	-			
Source-Drain Diode							
Forward On Voltage	V_{SD}	-	0.9	1.2	V	$I_F=20\text{A}, V_{GS}=0$	
Reverse Recovery Time	T_{rr}	-	30	-	nS	$V_R=20\text{V}, I_F=20\text{A}, di/dt=200\text{A}/\mu\text{s}$	
Reverse Recovery Charge	Q_{rr}	-	30	-	nC		

TYPICAL CHARACTERISTICS CURVE

Fig 1. Typical Output Characteristics

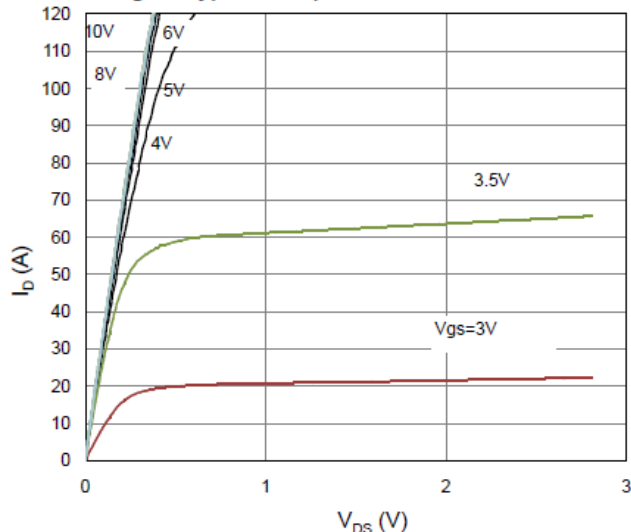


Figure 2. On-Resistance vs. Gate-Source Voltage

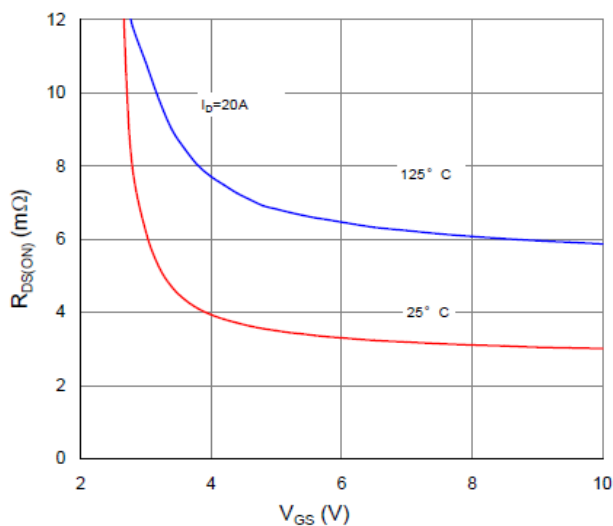


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

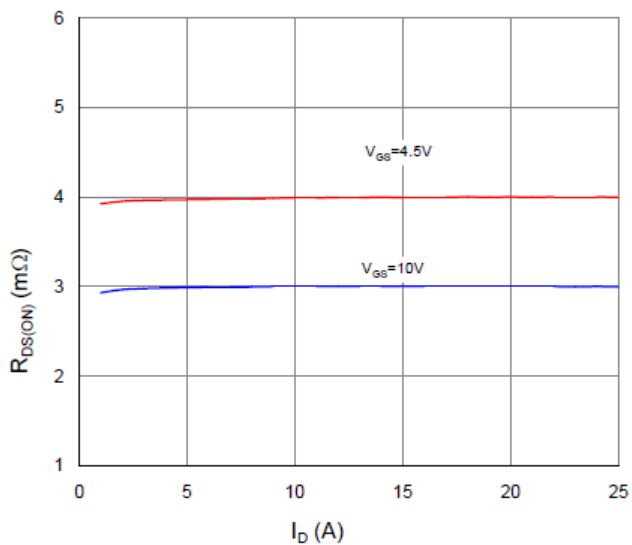


Figure 4. Normalized On-Resistance vs. Junction Temperature

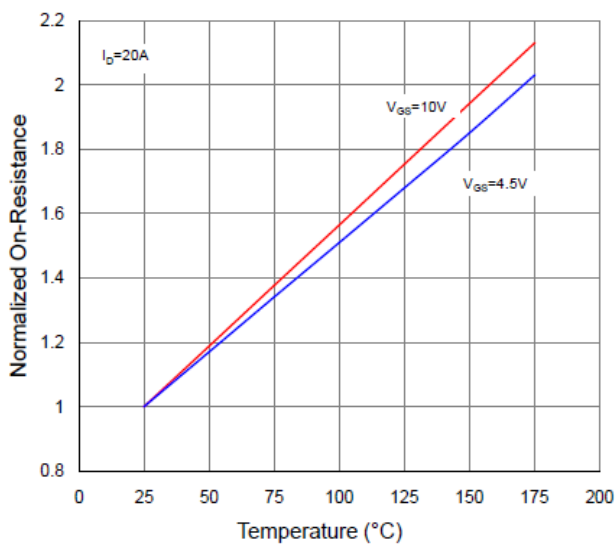


Figure 5. Typical Transfer Characteristics

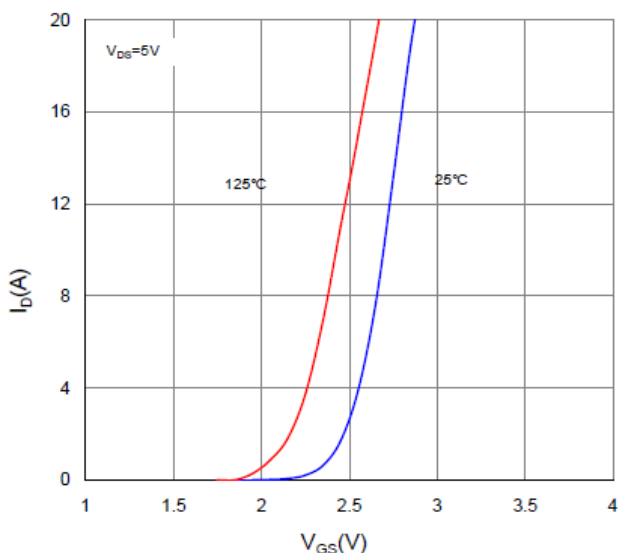
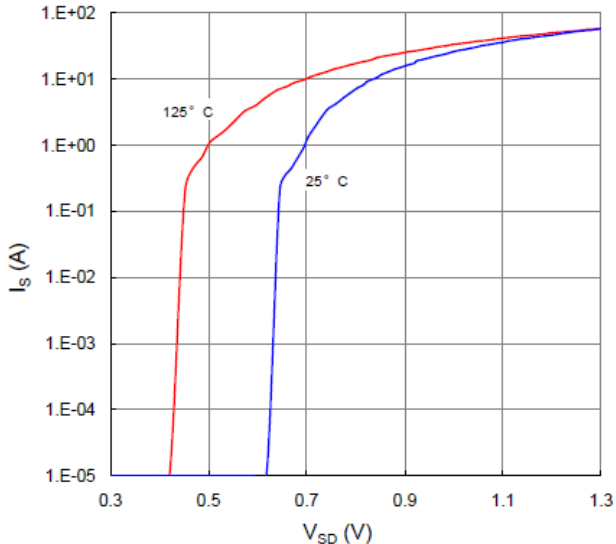


Figure 6. Typical Source-Drain Diode Forward Voltage



TYPICAL CHARACTERISTICS CURVE

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

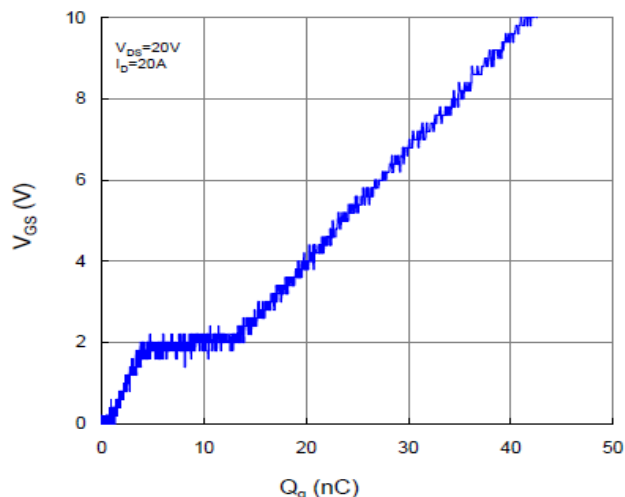


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

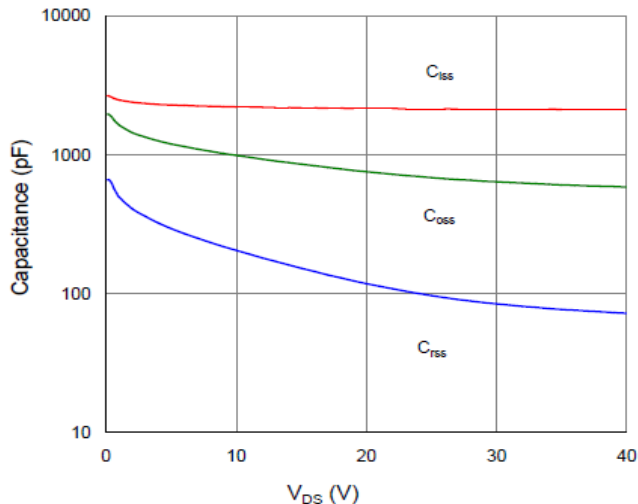


Figure 9. Maximum Safe Operating Area

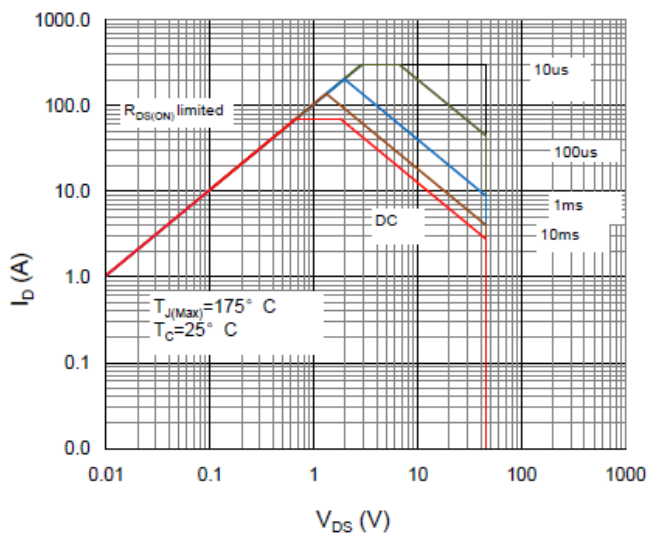


Figure 10. Maximum Drain Current vs. Case Temperature

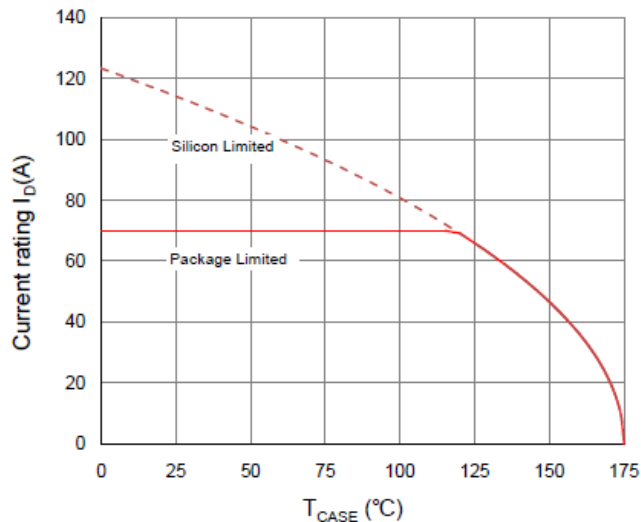


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

