

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

DESCRIPTION

The SSD2504S 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 .

FEATURES

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

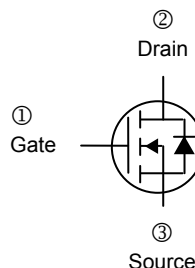
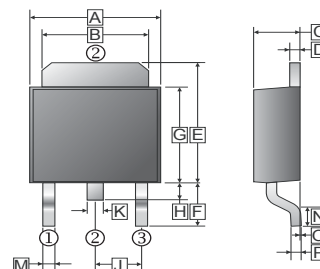
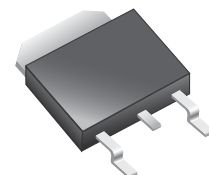
MARKING



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	6.80	J	2.30	REF.
B	5.20	5.50	K	0.64	0.90
C	2.15	2.40	M	0.50	1.1
D	0.45	0.58	N	0.9	1.65
E	6.8	7.5	O	0	0.15
F	2.40	3.0	P	0.43	0.58
G	5.40	6.25			
H	0.64	1.20			

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current @ $V_{GS}=10\text{V}$ ¹	I_D	$T_C=25^\circ\text{C}$	5.4
		$T_C=100^\circ\text{C}$	3.4
Pulsed Drain Current ²	I_{DM}	11	A
Total Power Dissipation ³	P_D	$T_C=25^\circ\text{C}$	20.8
		$T_A=25^\circ\text{C}$	1.13
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Thermal Resistance Rating			
Maximum Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	110	$^\circ\text{C} / \text{W}$
Maximum Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	6	$^\circ\text{C} / \text{W}$

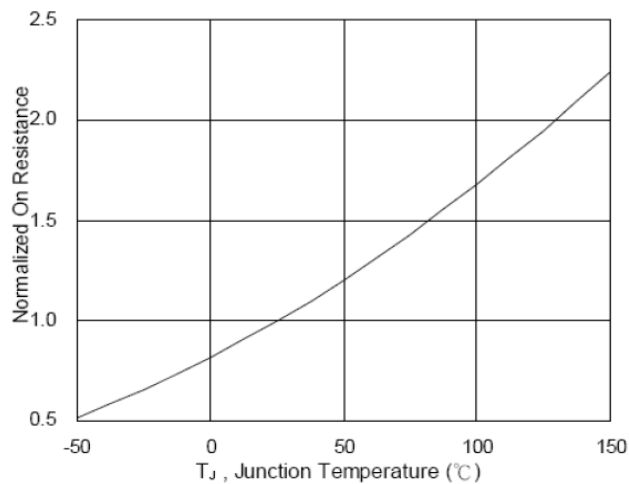
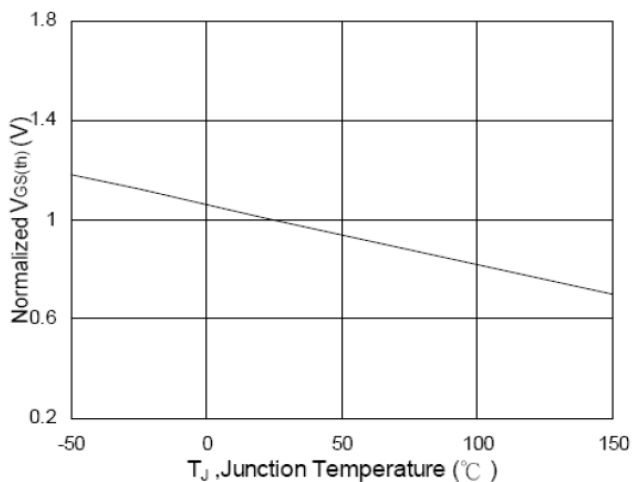
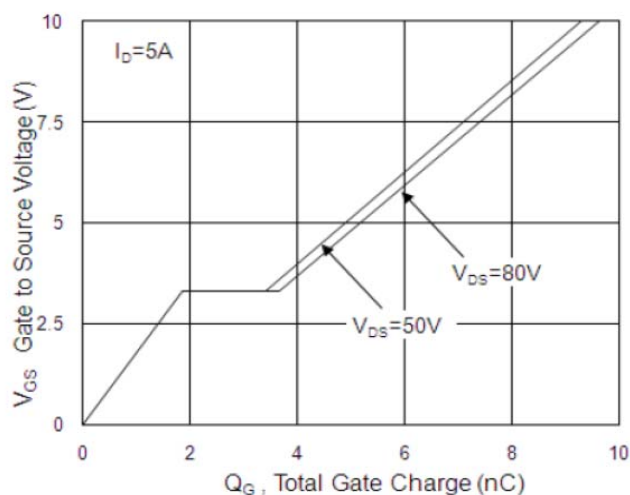
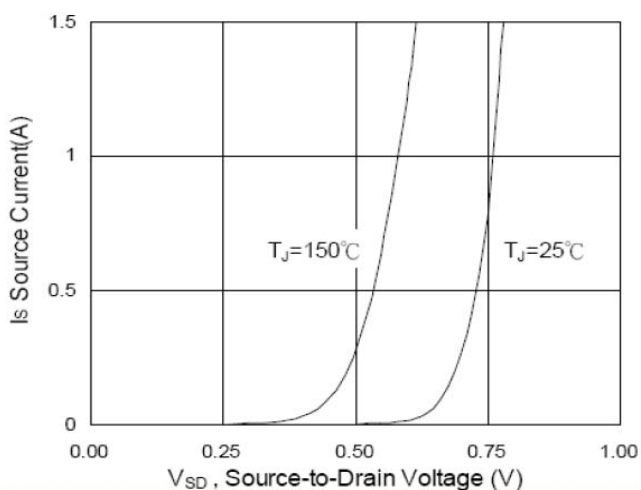
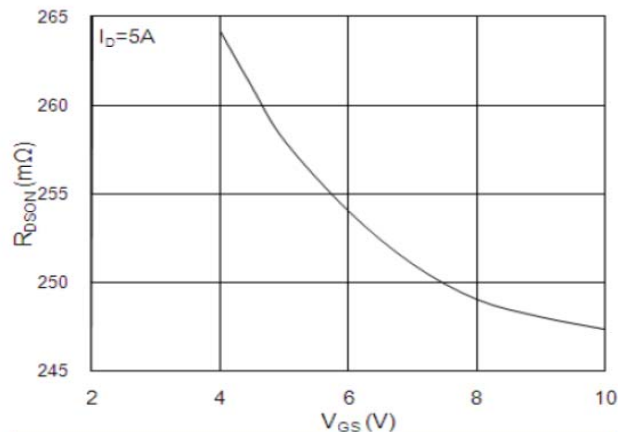
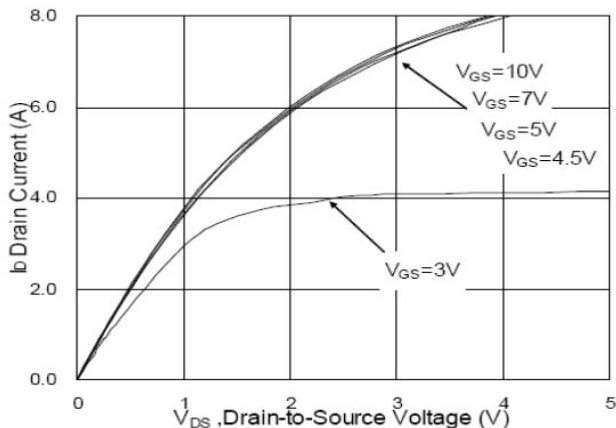
ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions	
Static							
Drain-Source Breakdown Voltage	BV_{DSS}	100	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$	
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	2.5	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	
Forward Transconductance	g_{fs}	-	12	-	S	$V_{DS}=5\text{V}, I_D=3\text{A}$	
Gate Resistance	R_G	-	2	-	Ω	$V_{DS}=V_{GS}=0, f=1.0\text{MHz}$	
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	$V_{DS}=80\text{V}, V_{GS}=0$
		$T_J=55^\circ\text{C}$	-	-	5		$V_{DS}=80\text{V}, V_{GS}=0$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	370	m Ω	$V_{GS}=10\text{V}, I_D=5\text{A}$	
		-	-	380		$V_{GS}=4.5\text{V}, I_D=3\text{A}$	
Total Gate Charge	Q_g	-	9.6	-	nC	$I_D=5\text{A}$ $V_{DS}=80\text{V}$ $V_{GS}=10\text{V}$	
Gate-Source Charge	Q_{gs}	-	1.83	-			
Gate-Drain ("Miller") Charge	Q_{gd}	-	1.85	-			
Turn-on Delay Time ²	$T_{d(on)}$	-	1.4	-	nS	$V_{DD}=50\text{V}$ $I_D=5\text{A}$ $V_{GS}=10\text{V}$ $R_G=3.3\ \Omega$ $R_L=30\ \Omega$	
Rise Time	T_r	-	30.6	-			
Turn-off Delay Time	$T_{d(off)}$	-	11.2	-			
Fall Time	T_f	-	6	-			
Input Capacitance	C_{iss}	-	508	-	pF	$V_{GS}=0$ $V_{DS}=15\text{V}$ $f=1.0\text{MHz}$	
Output Capacitance	C_{oss}	-	29	-			
Reverse Transfer Capacitance	C_{rss}	-	16.4	-			
Source-Drain Diode							
Diode Forward Voltage ²	V_{SD}	-	-	1.2	V	$I_S=1\text{A}, V_{GS}=0, T_J=25^\circ\text{C},$	
Reverse Recovery Time	T_{rr}	-	20	-	nS	$I_F=5\text{A}, di/dt=100\text{A}/\mu\text{S},$ $T_J=25^\circ\text{C},$	
Reverse Recovery Charge	Q_{rr}	-	19	-	nC		
Continuous Source Current ^{1,4}	I_S	-	-	5.4	A	$V_D=V_G=0, \text{Force Current}$	
Pulsed Source Current ^{2,4}	I_{SM}	-	-	11	A		

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2_{oz} copper.
2. The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
3. The power dissipation is limited by 150°C, junction temperature
4. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

CHARACTERISTIC CURVES



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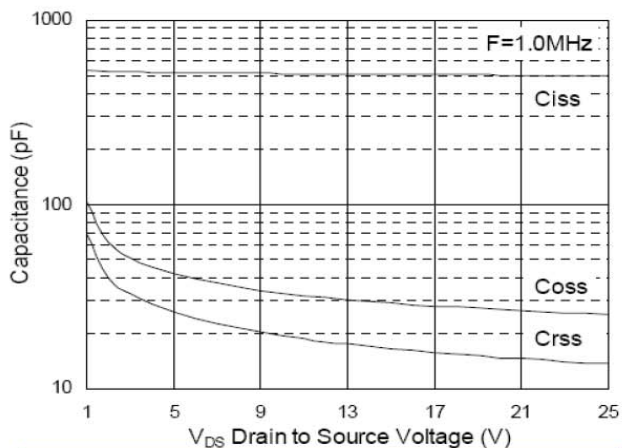


Fig.7 Capacitance

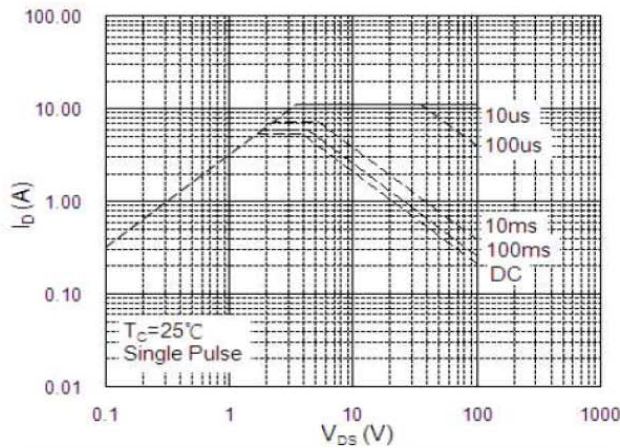


Fig.8 Safe Operating Area

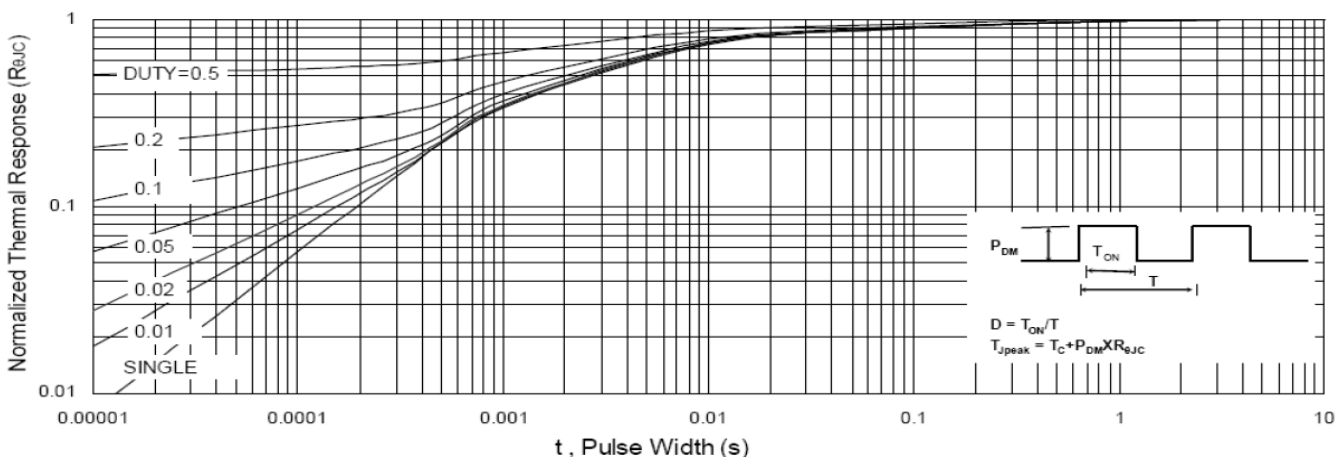


Fig.9 Normalized Maximum Transient Thermal Impedance

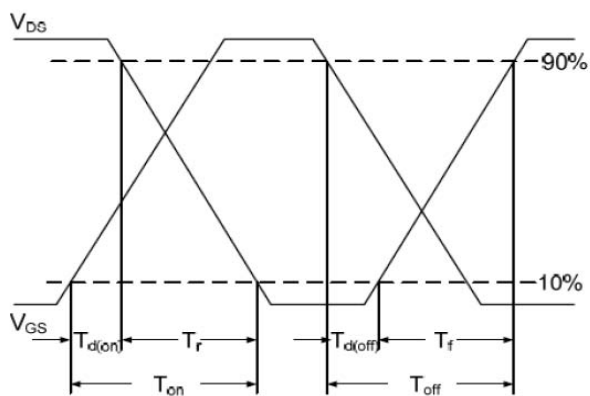


Fig.10 Switching Time Waveform

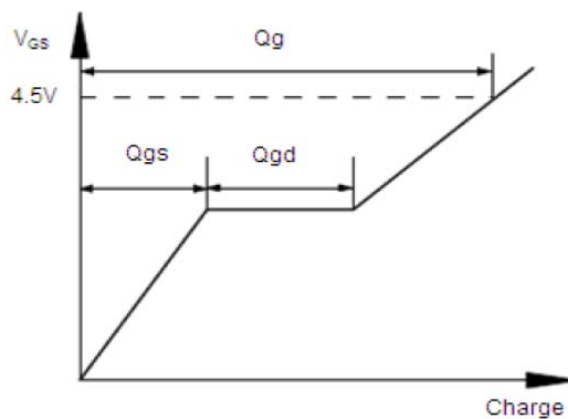


Fig.11 Gate Charge Waveform