

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

DESCRIPTION

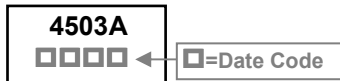
The SSG4503A-C is the highest performance trench N-Ch and P-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SSG4503A-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

- Simple Drive Requirement
- Lower On-Resistance
- Fast Switching Performance

MARKING



PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	2.5K	13 inch

ORDER INFORMATION

Part Number	Type
SSG4503A-C	Lead (Pb)-free and Halogen-free

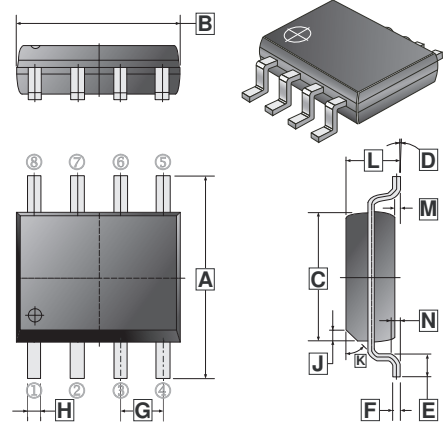
ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings		Unit	
		N-Ch	P-Ch		
Drain-Source Voltage	V_{DS}	30	-30	V	
Gate-Source Voltage	V_{GS}	± 20		V	
Continuous Drain Current, @ $V_{GS}=10V$ ¹	I_D	$T_C=25^\circ C$	11	-10.4	A
		$T_C=100^\circ C$	7	-6.6	
		$T_A=25^\circ C$	8.2	-7.8	
		$T_A=70^\circ C$	6.5	-6.2	
Pulsed Drain Current ³	I_{DM}	30	-30	A	
Total Power Dissipation	P_D	2		W	
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150		$^\circ C$	

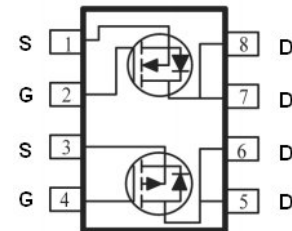
Thermal Data

Parameter	Symbol	Rating	Unit
Thermal Resistance Junction-ambient ¹	$R_{\theta JA}$	$t \leq 10sec, 62.5$	$^\circ C/W$
		Steady State, 90	
Thermal Resistance Junction-ambient ²		135	
Thermal Resistance Junction-case ¹	$R_{\theta JC}$	40	

SOP-8



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.79	6.20	H	0.33	0.51
B	4.70	5.11	J	0.375 REF.	
C	3.80	4.00	K	45° REF.	
D	0°	8°	L	1.3	1.752
E	0.40	1.27	M	0	0.25
F	0.10	0.25	N	0.25 REF.	
G	1.27 TYP.				



N-CHANNEL 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}	30	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$	
Gate Threshold Voltage	$V_{GS(th)}$	1	-	3	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	
Forward Transfer Conductance	g_{fs}	-	6	-	S	$V_{DS}=5\text{V}, I_D=7\text{A}$	
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	$V_{DS}=24\text{V}, V_{GS}=0$
		$T_J=55^\circ\text{C}$	-	-	5		
Static Drain-Source On-Resistance ⁴	$R_{DS(ON)}$	-	-	18	m Ω	$V_{GS}=10\text{V}, I_D=6\text{A}$	
		-	-	25		$V_{GS}=4.5\text{V}, I_D=4\text{A}$	
Total Gate Charge	Q_g	-	6	-	nC	$I_D=7\text{A}$ $V_{DS}=15\text{V}$ $V_{GS}=4.5\text{V}$	
Gate-Source Charge	Q_{gs}	-	2.5	-			
Gate-Drain Change	Q_{gd}	-	2.1	-			
Turn-on Delay Time	$T_{d(on)}$	-	2.4	-	nS	$V_{DS}=15\text{V}$ $V_{GS}=10\text{V}$ $I_D=7\text{A}$ $R_G=3.3\Omega$	
Rise Time	T_r	-	7.8	-			
Turn-off Delay Time	$T_{d(off)}$	-	22	-			
Fall Time	T_f	-	4	-			
Input Capacitance	C_{iss}	-	572	-	pF	$V_{GS}=0$ $V_{DS}=15\text{V}$ $f=1\text{MHz}$	
Output Capacitance	C_{oss}	-	80	-			
Reverse Transfer Capacitance	C_{rss}	-	65	-			
Source-Drain Diode							
Forward on Voltage ⁴	V_{SD}	-	-	1.2	V	$I_S=1\text{A}, V_{GS}=0, T_J=25^\circ\text{C}$	
Continuous Source Current ¹	I_S	-	-	8.2	A		
Pulsed Source Current ³	I_{SM}	-	-	30			

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	BV _{DSS}	-30	-	-	V	V _{GS} =0, I _D = -250μA	
Gate Threshold Voltage	V _{GS(th)}	-1	-	-3	V	V _{DS} =V _{GS} , I _D = -250μA	
Forward Transfer Conductance	g _{fs}	-	5	-	S	V _{DS} = -5V, I _D = -6A	
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V	
Drain-Source Leakage Current	I _{DSS}	T _J =25°C	-	-	-1	μA	V _{DS} = -24V, V _{GS} =0
		T _J =55°C	-	-	-5		
Static Drain-Source On-Resistance ⁴	R _{DS(ON)}	-	-	20	mΩ	V _{GS} = -10V, I _D = -6A	
		-	-	32		V _{GS} = -4.5V, I _D = -4A	
Total Gate Charge	Q _g	-	12.4	-	nC	I _D = -7A V _{DS} = -20V V _{GS} = -4.5V	
Gate-Source Charge	Q _{gs}	-	3.4	-			
Gate-Drain Change	Q _{gd}	-	5.1	-			
Turn-on Delay Time	T _{d(on)}	-	24.2	-	nS	V _{DS} = -15V V _{GS} = -10V I _D = -1A R _G =3.3Ω	
Rise Time	T _r	-	23.8	-			
Turn-off Delay Time	T _{d(off)}	-	58.2	-			
Fall Time	T _f	-	9	-			
Input Capacitance	C _{iss}	-	1345	-	pF	V _{GS} =0 V _{DS} = -15V f=1MHz	
Output Capacitance	C _{oss}	-	194	-			
Reverse Transfer Capacitance	C _{rss}	-	158	-			
Source-Drain Diode							
Forward on Voltage ⁴	V _{SD}	-	-	-1.2	V	I _S = -1A, V _{GS} =0, T _J =25°C	
Continuous Source Current ¹	I _S	-	-	-7.8	A		
Pulsed Source Current ³	I _{SM}	-	-	-30			

Notes:

1. Surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. When mounted on Min. copper pad.
3. Pluse width limited by maximum junction temperature.
4. The data tested by pulsed, pulse width≤300us, duty cycle≤2%.

N-CHANNEL CHARACTERISTIC CURVE

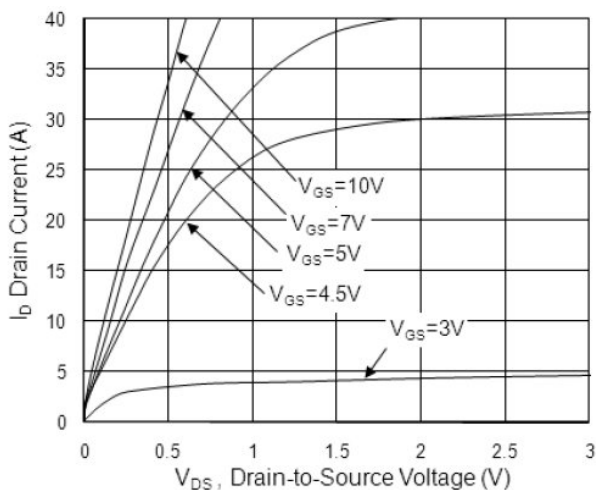


Fig.1 Typical Output Characteristics

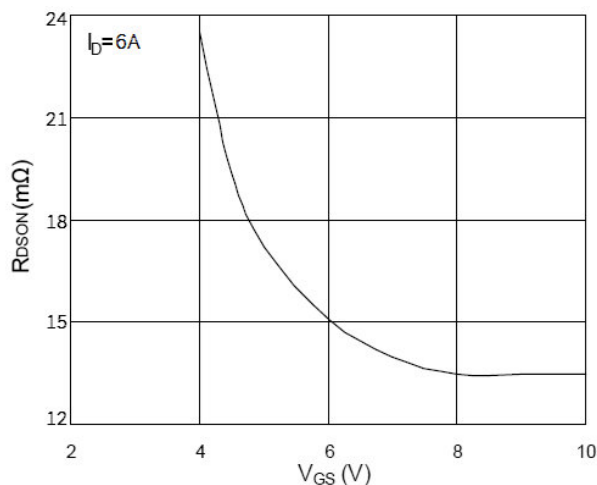


Fig.2 On-Resistance vs. Gate-Source

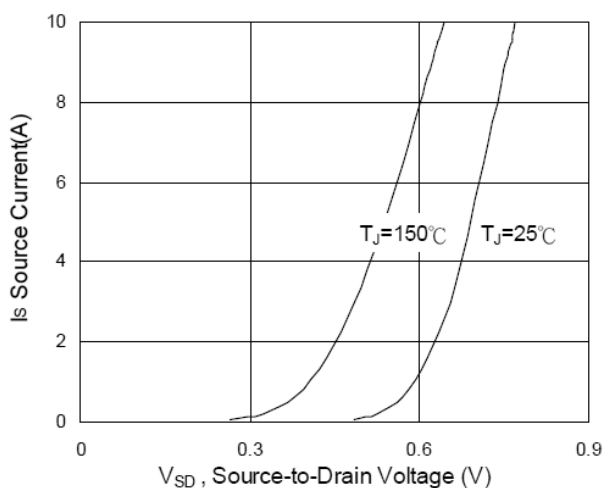


Fig.3 Forward Characteristics Of Reverse

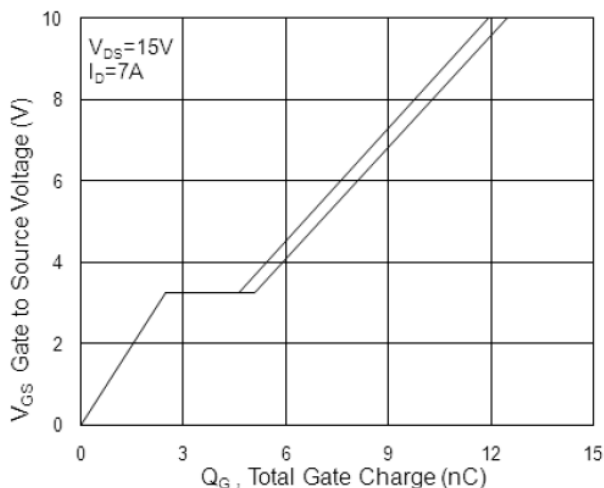


Fig.4 Gate-Charge Characteristics

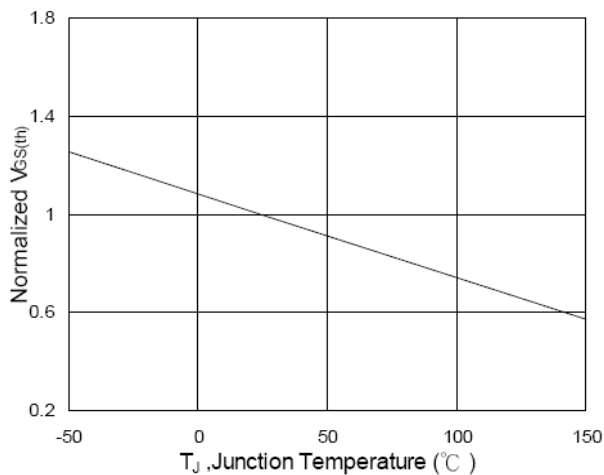


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

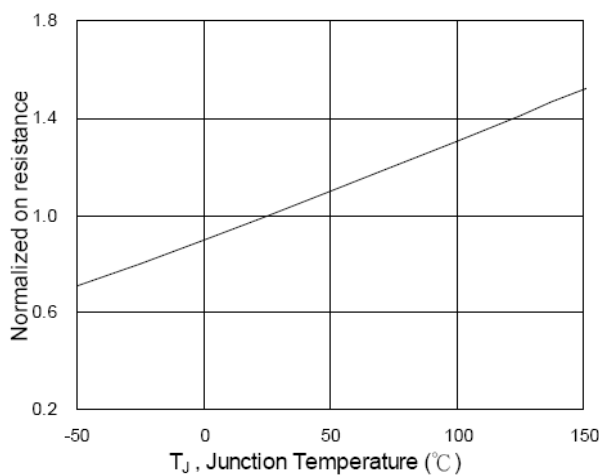


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

N-CHANNEL CHARACTERISTIC CURVE

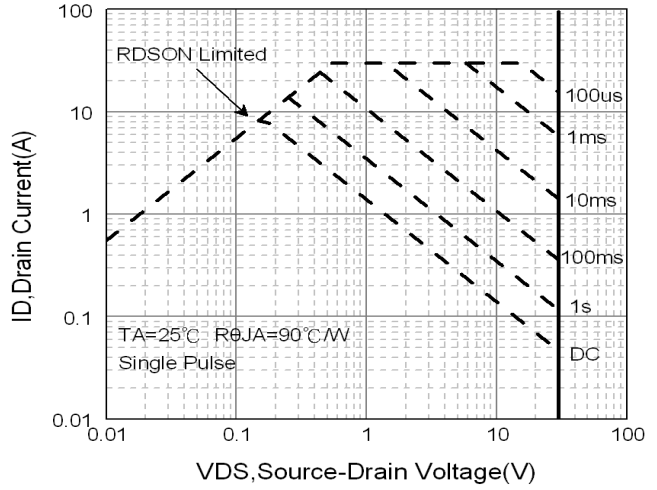
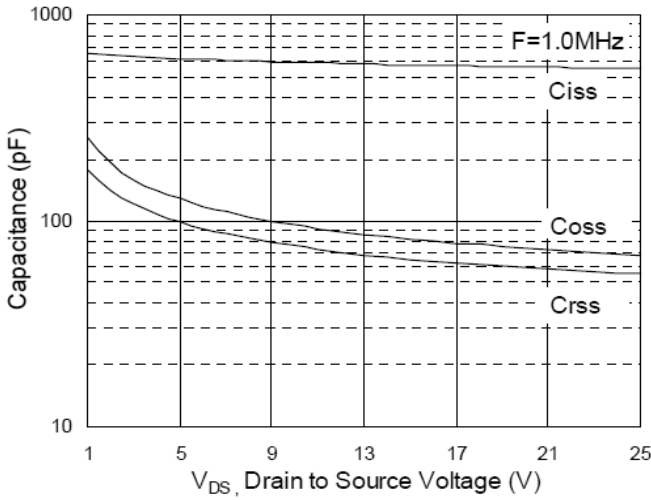


Fig.7 Capacitance

Fig.8 Safe Operating Area

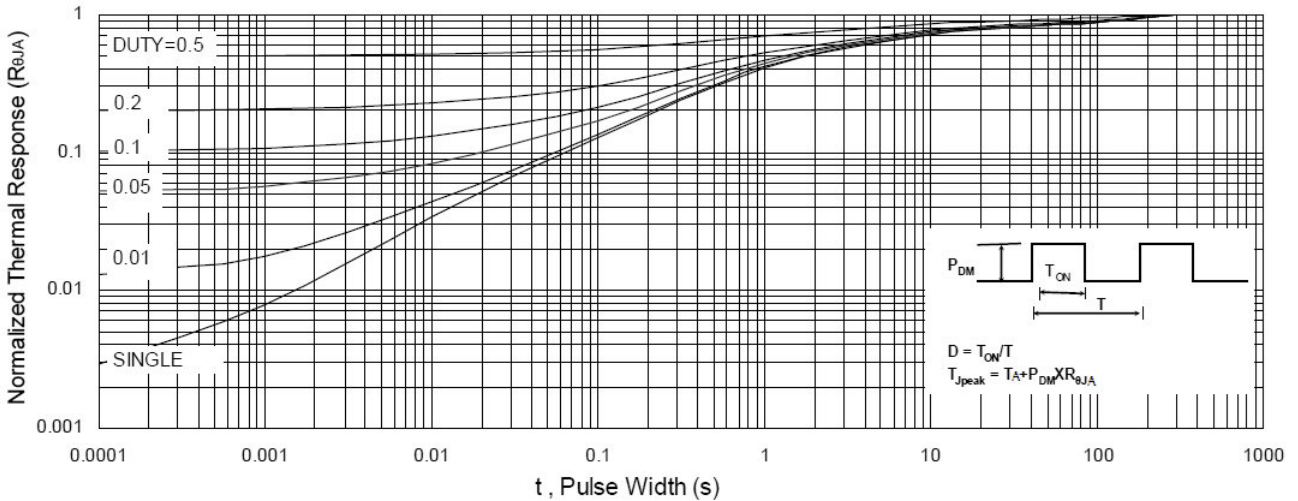


Fig.9 Normalized Maximum Transient Thermal Impedance

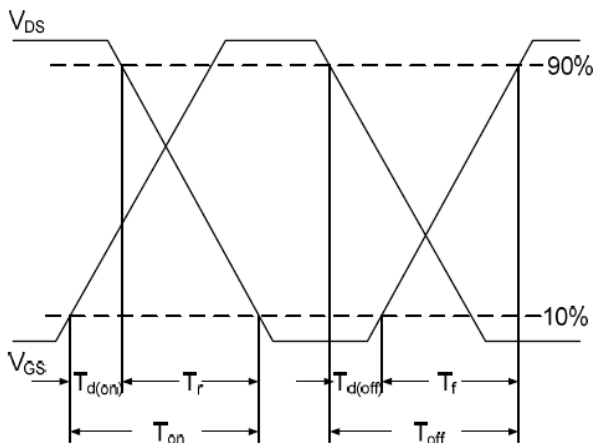


Fig.10 Switching Time Waveform

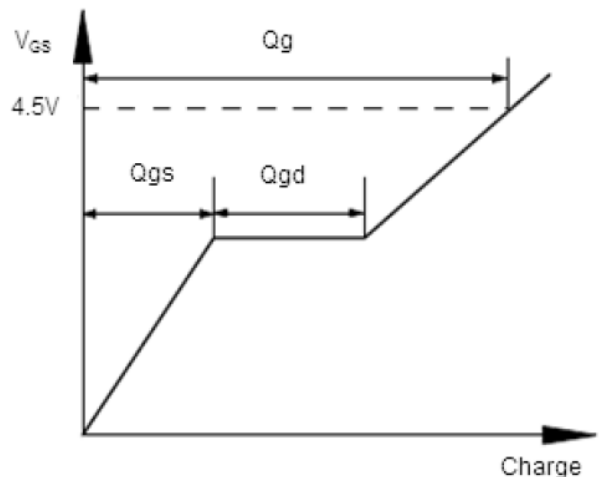


Fig.11 Gate Charge Waveform

P-CHANNEL CHARACTERISTIC CURVE

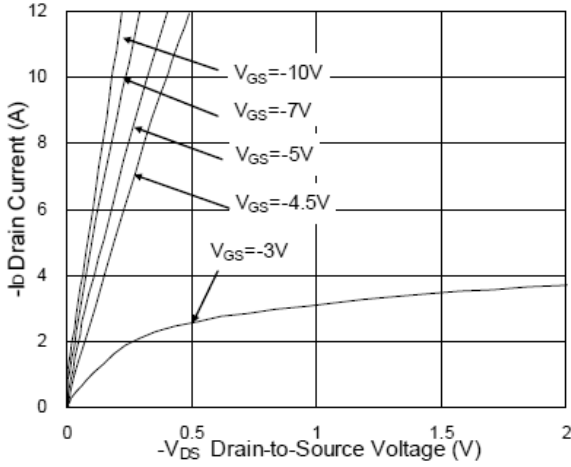


Fig.1 Typical Output Characteristics

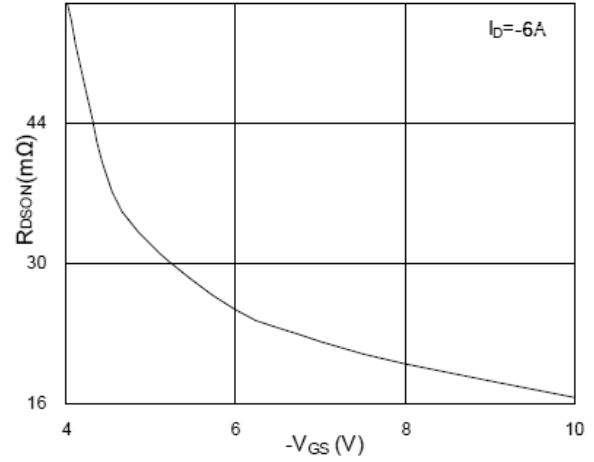


Fig.2 On-Resistance v.s Gate-Source

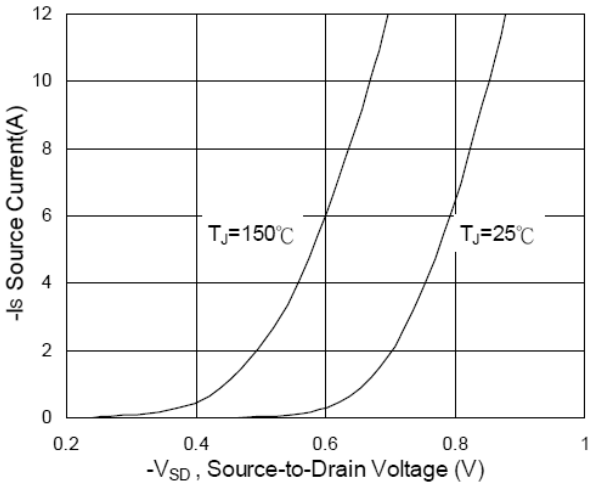


Fig.3 Forward Characteristics of Reverse

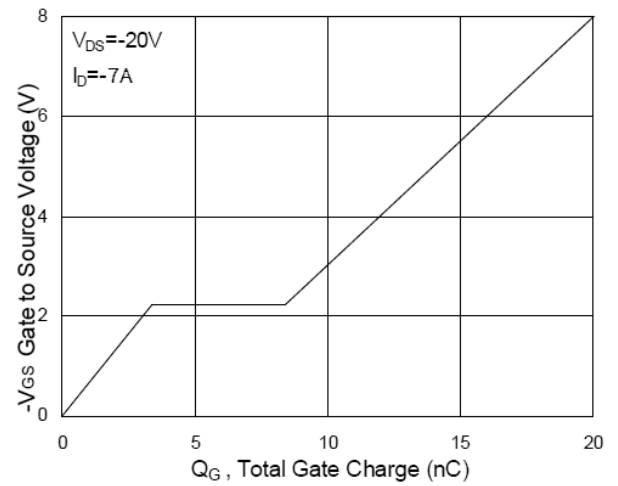


Fig.4 Gate-Charge Characteristics

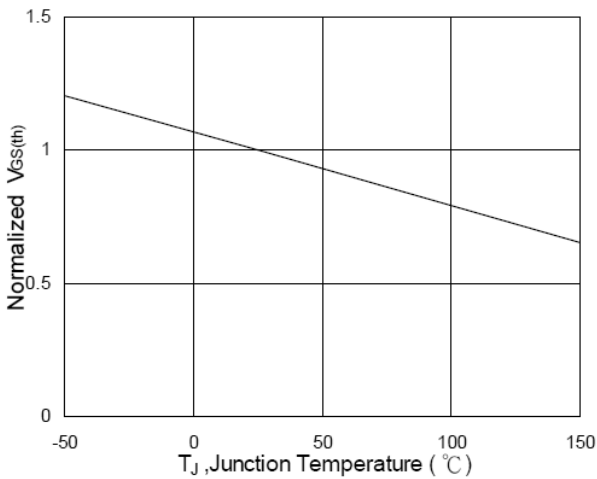


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

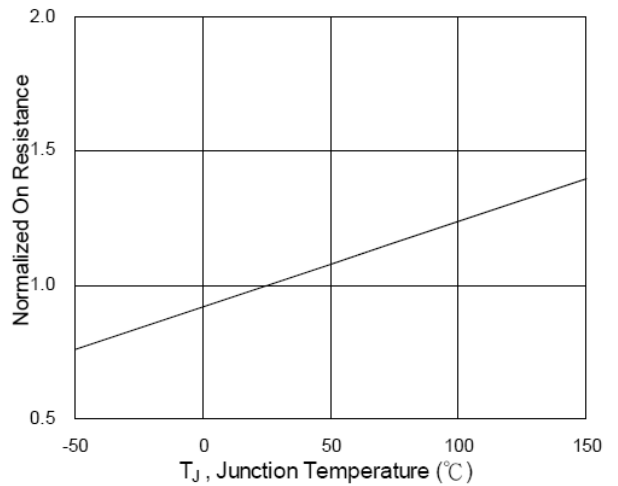


Fig.6 Normalized $R_{DS(ON)}$ v.s T_J

P-CHANNEL CHARACTERISTIC CURVE

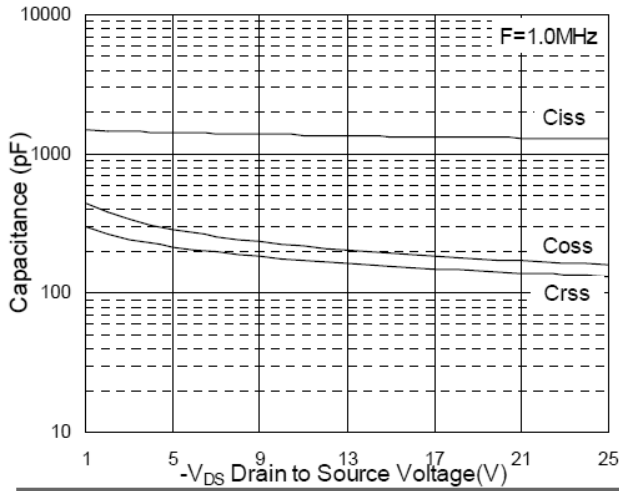


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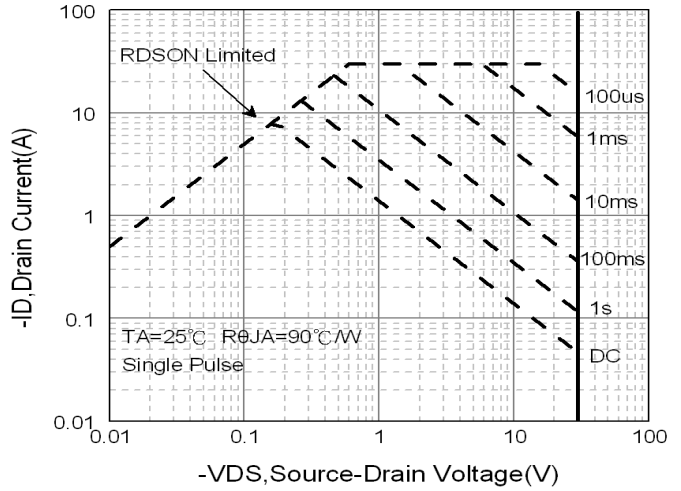


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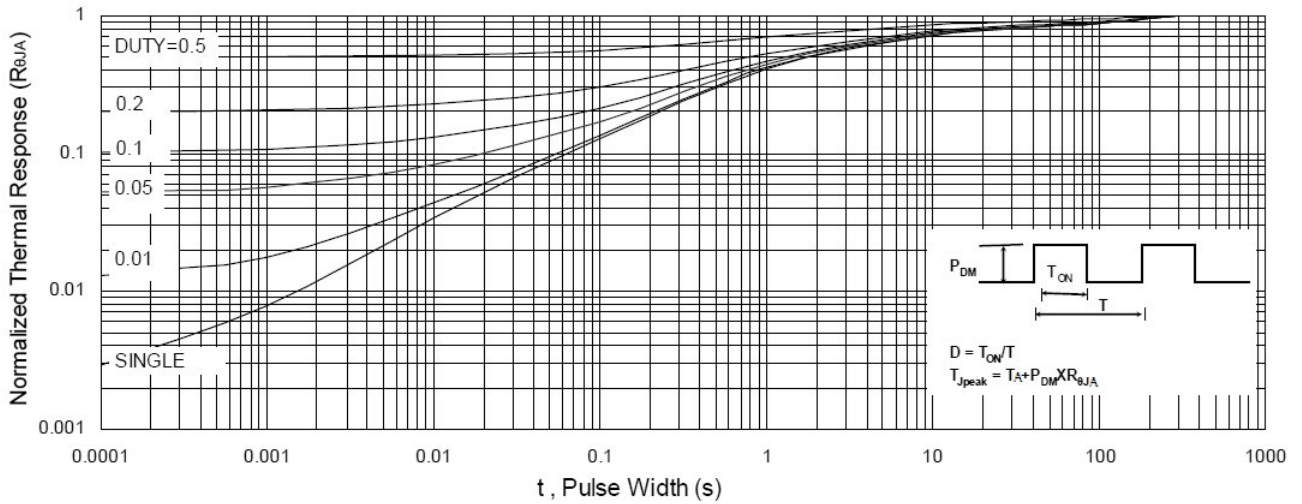


Fig.9 Normalized Maximum Transient Thermal Impedance

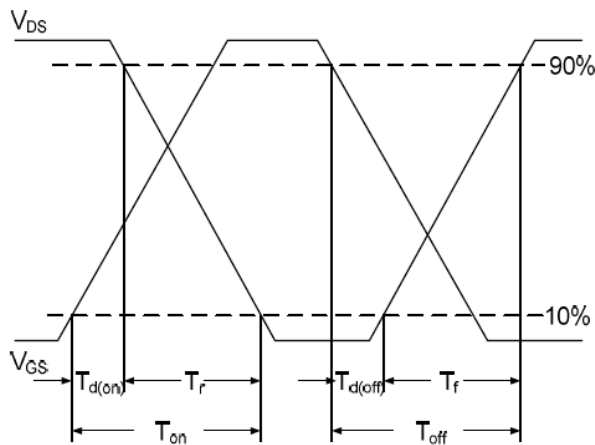


Fig.10 Switching Time Waveform

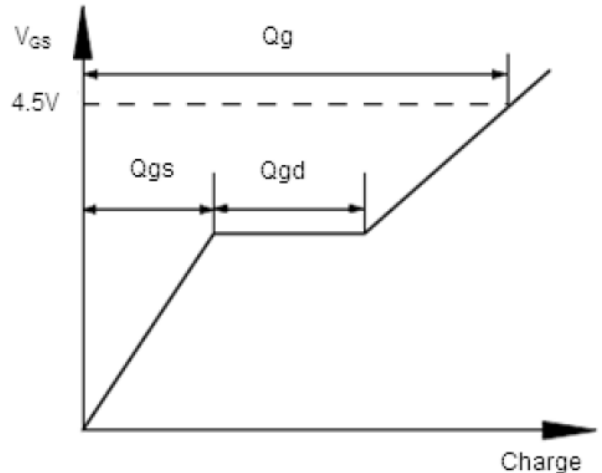


Fig.11 Gate Charge Waveform