Elektronische Bauelemente

SSG4503A-C

N-Ch: 11A, 30V, $R_{DS(ON)}$ 18 mΩ
P-Ch: -10.4A, -30V, $R_{DS(ON)}$ 20 mΩ
N & P-Ch Enhancement Mode Power MOSFET

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

DESCRIPTION

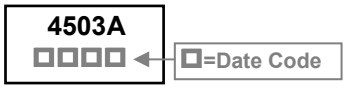
The SSG4503A-C is the highest performance trench N-Ch and P-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

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



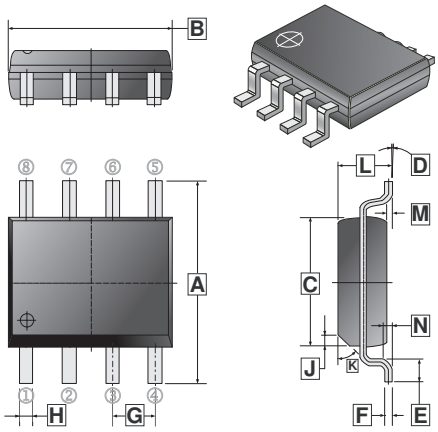
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	2.5K	13 inch

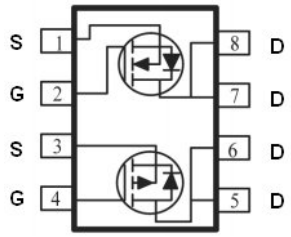
ORDER INFORMATION

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

SOP-8



REF.	Millimeter Min.	Millimeter Max.	REF.	Millimeter Min.	Millimeter 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.				



ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Ratings N-Ch	Ratings P-Ch	Unit
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20		V
Continuous Drain Current, @V_{GS}=10V [1]	T_C=25°C	I_D	11	-10.4	A
	T_C=100°C		7	-6.6	
	T_A=25°C		8.2	-7.8	
	T_A=70°C		6.5	-6.2	
Pulsed Drain Current [3]		I_{DM}	30	-30	A
Total Power Dissipation	T_A=25°C	P_D	2		W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150		°C
Thermal Data					
Thermal Resistance Junction-ambient [1]		$R_{\theta JA}$	t≦10sec, 62.5		°C/W
			Steady State, 90		
Thermal Resistance Junction-ambient [2]			135		
Thermal Resistance Junction-case [1]		$R_{\theta JC}$	40		

N-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}	-	6	-	S	V_{DS}=5V, I_D=7A
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}=24V, V_{GS}=0
	T_J=55°C		-	-	5		
Static Drain-Source On-Resistance [4]		$R_{DS(ON)}$	-	-	18	mΩ	V_{GS}=10V, I_D=6A
			-	-	25		V_{GS}=4.5V, I_D=4A
Total Gate Charge		Q_g	-	6	-	nC	I_D=7A V_{DS}=15V V_{GS}=4.5V
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}=15V V_{GS}=10V I_D=7A R_G=3.3Ω
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}=15V f=1MHz
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=1A, V_{GS}=0, T_J=25°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	T_J=25°C	I_{DSS}	-	-	-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 inch^2 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

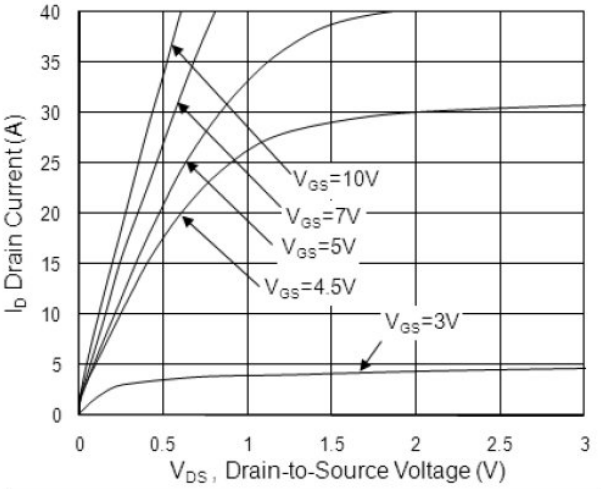


Fig.1 Typical Output Characteristics

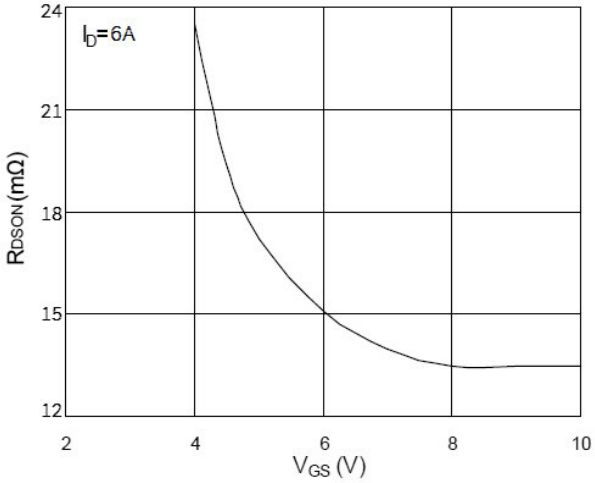


Fig.2 On-Resistance vs. Gate-Source

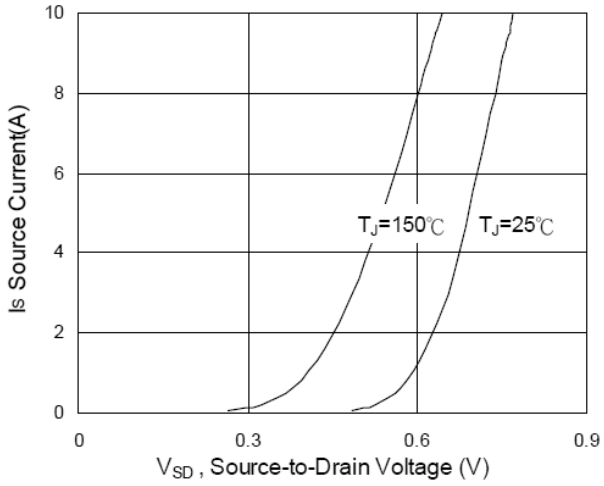


Fig.3 Forward Characteristics Of Reverse

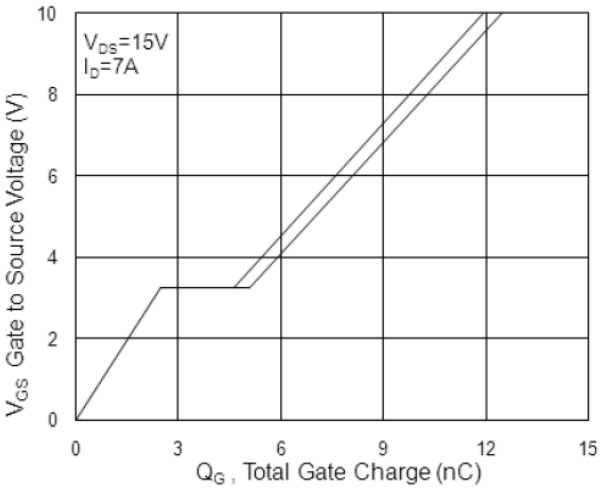


Fig.4 Gate-Charge Characteristics

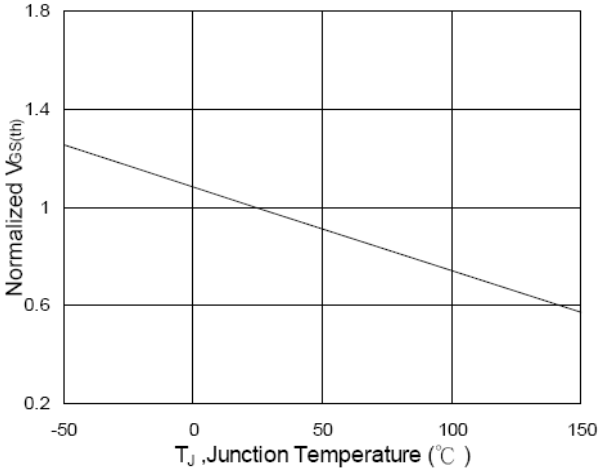


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

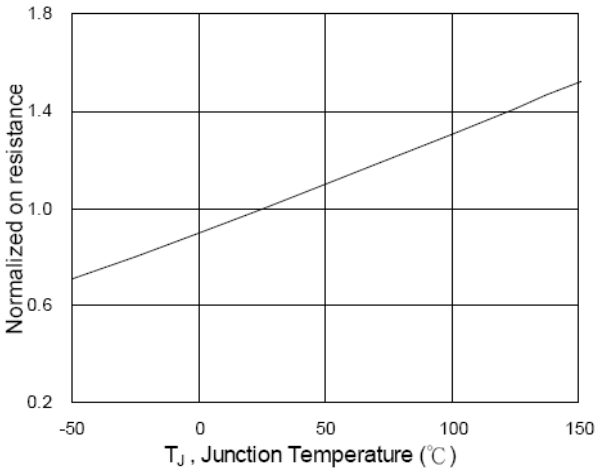


Fig.6 Normalized R_{DSON} vs. T_J

N-CHANNEL CHARACTERISTIC CURVE

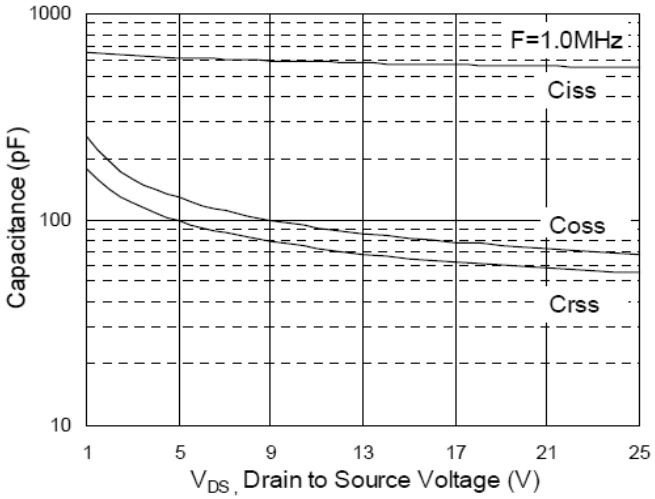


Fig.7 Capacitance

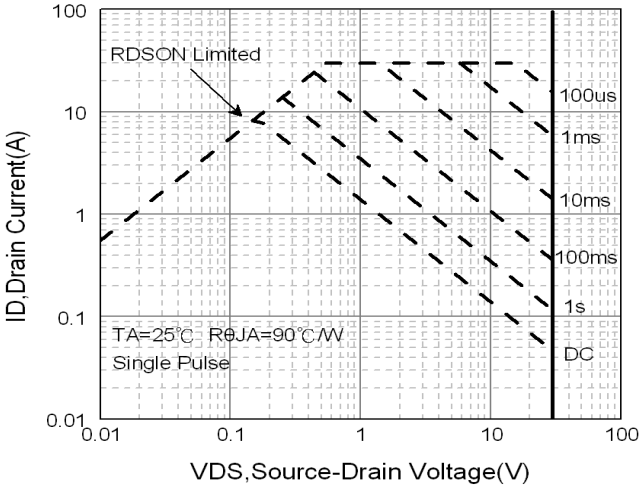


Fig.8 Safe Operating Area

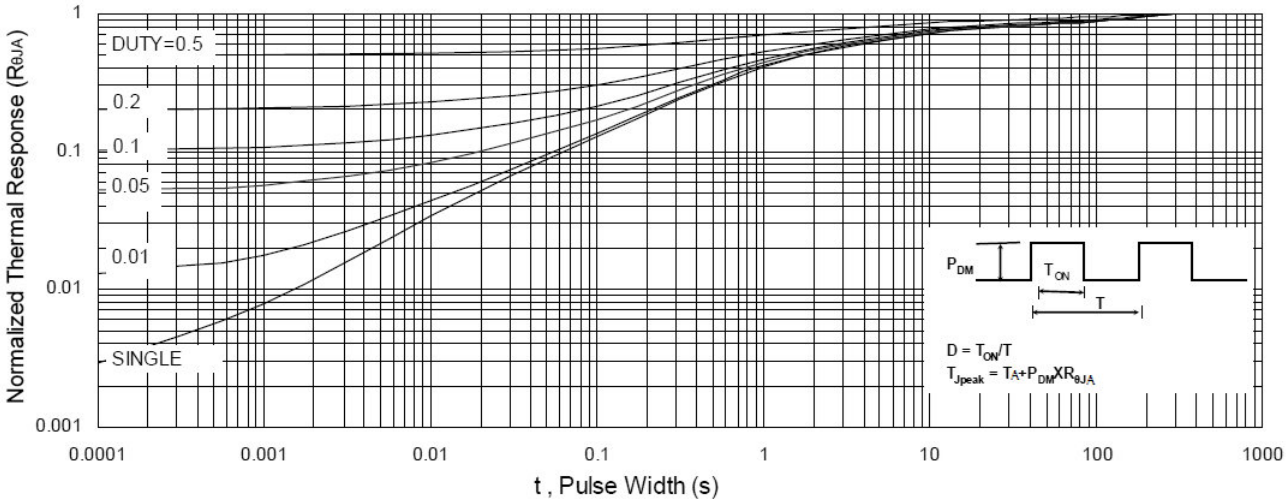


Fig.9 Normalized Maximum Transient Thermal Impedance

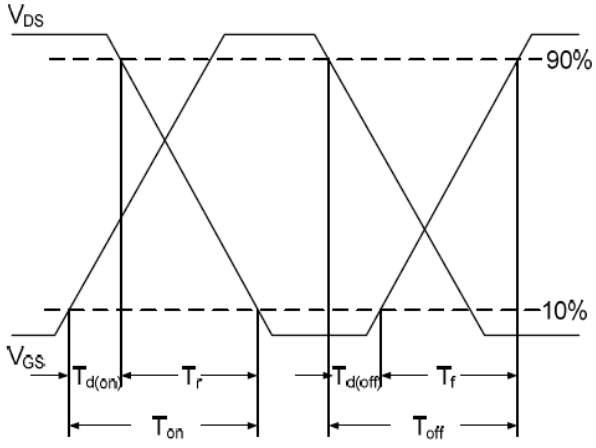


Fig.10 Switching Time Waveform

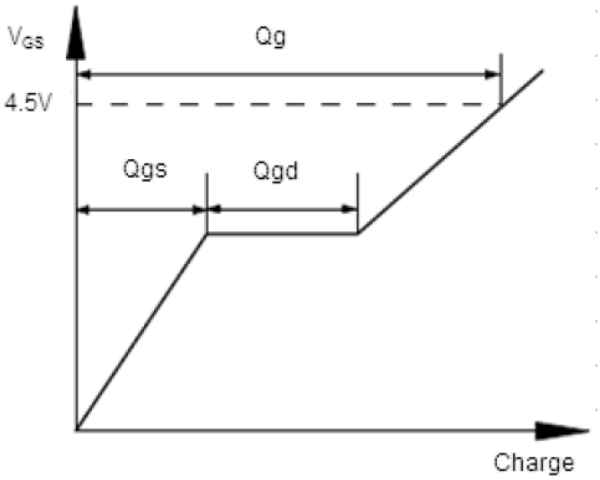
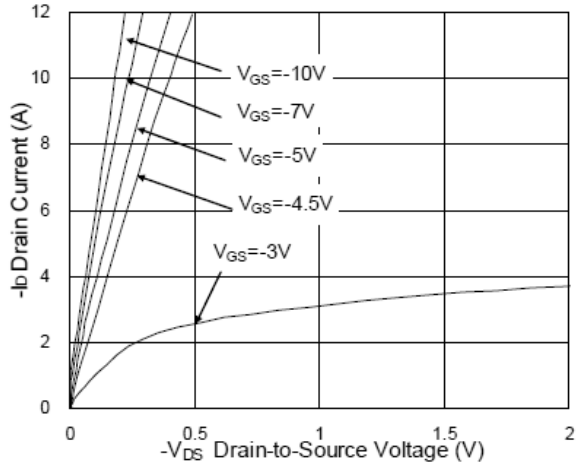


Fig.11 Gate Charge Waveform

P-CHANNEL CHARACTERISTIC CURVE



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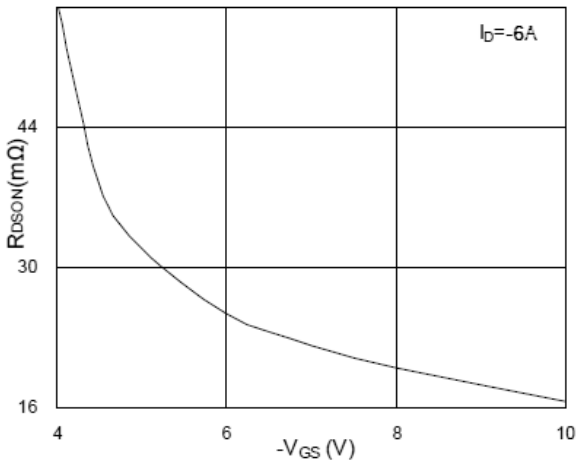
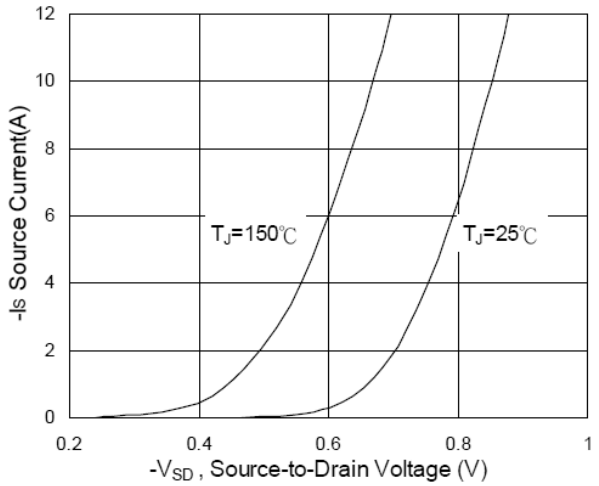


Fig.2 On-Resistance v.s Gate-Source



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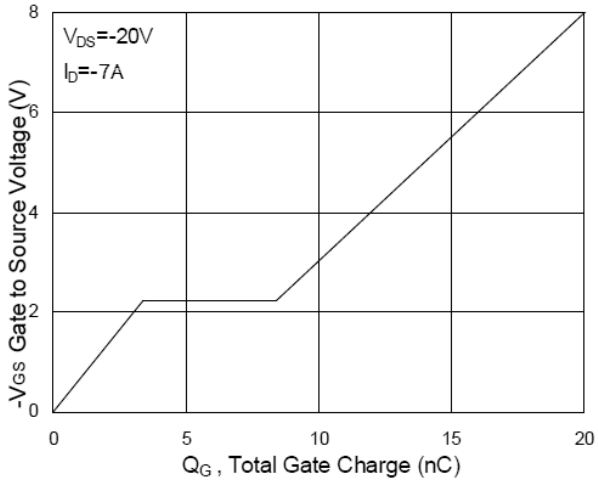


Fig.4 Gate-Charge Characteristics

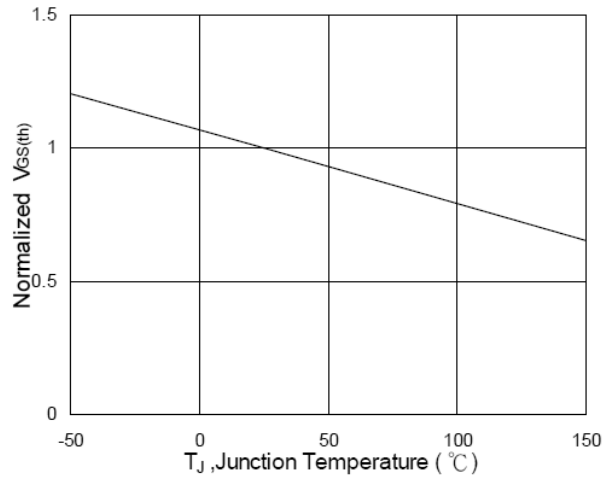


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

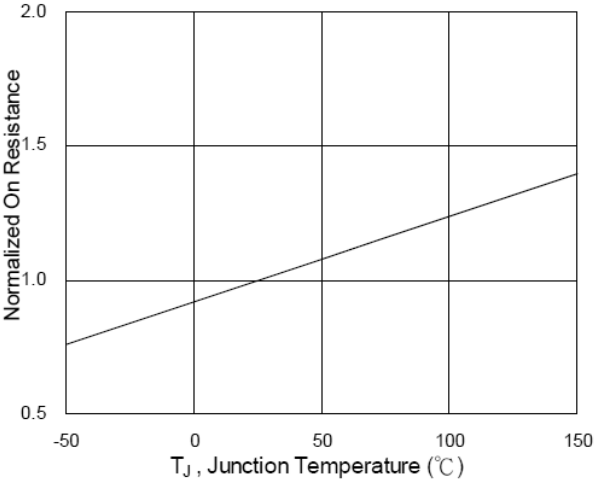


Fig.6 Normalized R_{DSON} v.s T_J

P-CHANNEL CHARACTERISTIC CURVE

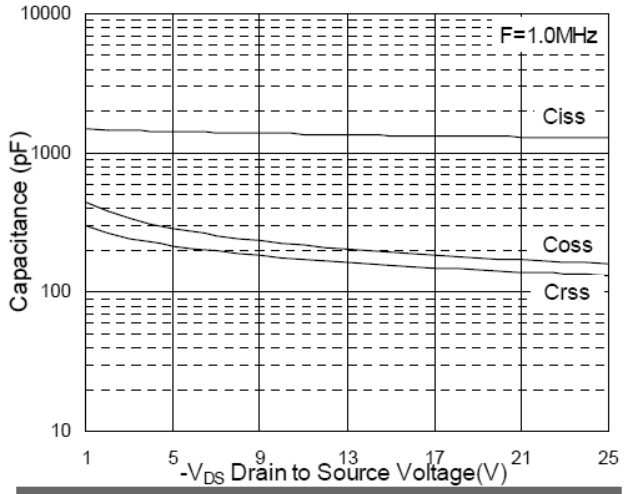
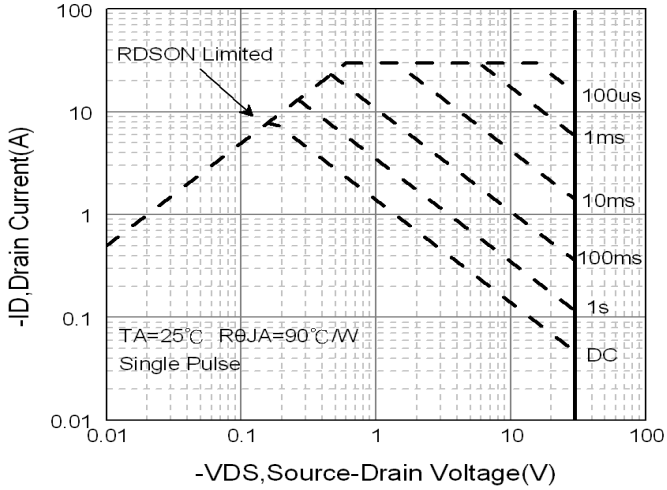


Fig.7 Capacitance



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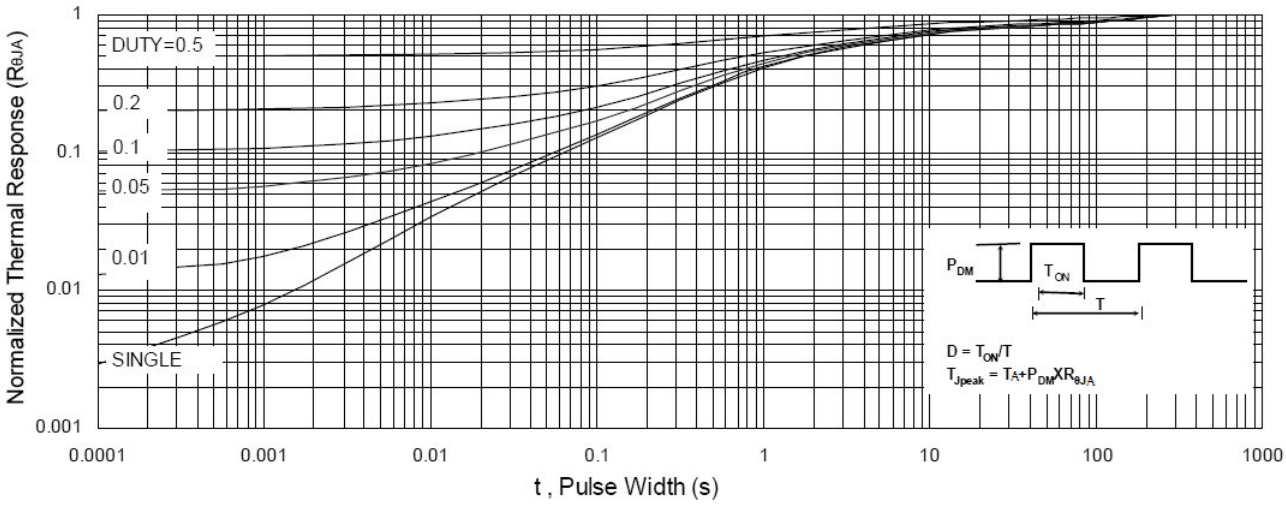

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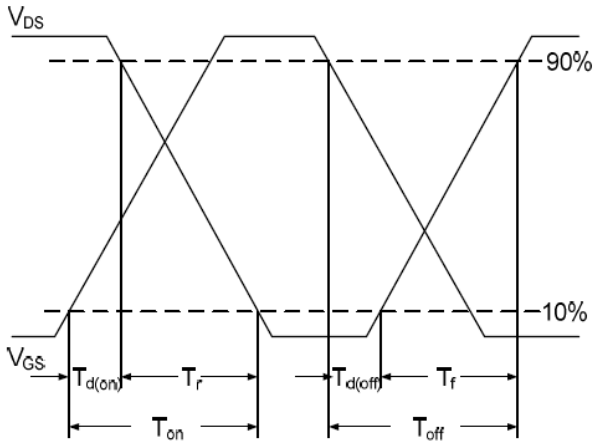

Fig.10 Switching Time Waveform

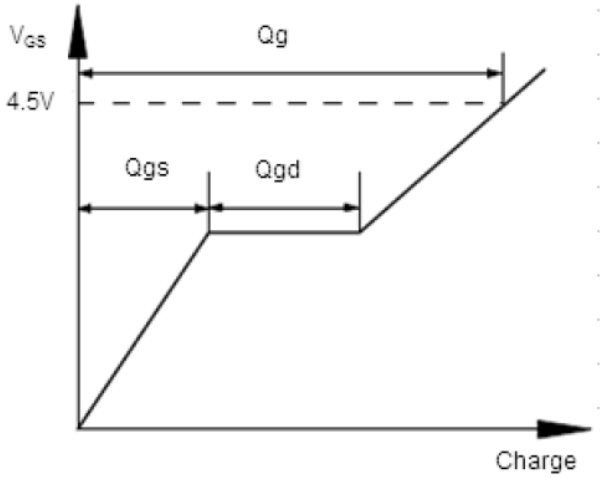

Fig.11 Gate Charge Waveform