

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

DESCRIPTION

The SSPRDJ4503A-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 SSPRDJ4503A-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

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

MARKING



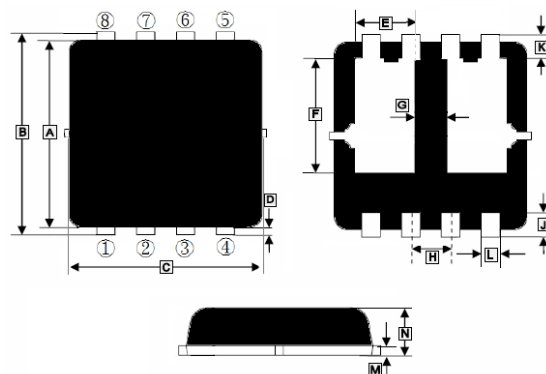
PACKAGE INFORMATION

Package	MPQ	Leader Size
DFN3x3-8DJ	5K	13 inch

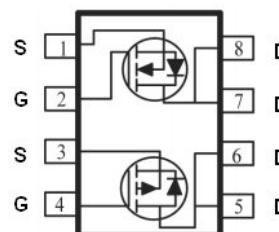
ORDER INFORMATION

Part Number	Type
SSPRDJ4503A-C	Lead (Pb)-free and Halogen-free

DFN3x3-8DJ



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.9	3.1	H	0.55	0.75
B	3.15	3.45	J	0.3	0.5
C	2.9	3.1	K	0.315	0.515
D	0.15 BSC		L	0.2	0.4
E	0.935	1.135	M	0.152 REF.	
F	1.535	1.935	N	0.65	0.85
G	0.28	0.48			



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 ¹ @ V _{GS} =10V	I _D	T _C =25°C	25.8	-20.7	A
		T _C =100°C	16.3	-13	
		T _A =25°C	9.5	-7.6	
		T _A =70°C	7.6	-6.1	
Pulsed Drain Current ³	I _{DM}	30	-30	A	
Total Power Dissipation	P _D	T _C =25°C	16.7		W
		T _A =25°C	2.27		
Operating Junction & Storage Temperature Range	T _J , T _{STG}	-55~150		°C	
Thermal Data					
Thermal Resistance Junction-Ambient ¹	t ≤ 10s	R _{θJA}	55		°C/W
Thermal Resistance Junction-Ambient ²			135		
Thermal Resistance Junction-Case ¹		R _{θJC}	7.5		

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	B _{VDS}	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	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)}	-	12	18	mΩ	V _{GS} =10V, I _D =6A	
		-	15	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 ("Miller") Charge	Q _{gd}	-	2.1	-			
Turn-on Delay Time	T _{d(on)}	-	2.4	-	nS	V _{DS} =15V I _D =7A V _{GS} =10V 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							
Continuous Source Current ¹	I _S	-	-	9.5	A		
Pulsed Source Current ³	I _{SM}	-	-	30			
Forward on Voltage ⁴	V _{SD}	-	-	1.2	V	V _{GS} =0, I _S =1A, T _J =25°C	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	B _{VDS}	-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)}	-	18	28	mΩ	V _{GS} = -10V, I _D = -6A	
		-	24	40		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 ("Miller") Charge	Q _{gd}	-	5.1	-			
Turn-on Delay Time	T _{d(on)}	-	24.2	-	nS	V _{DS} = -15V I _D = -1A V _{GS} = -10V 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							
Continuous Source Current ¹	I _S	-	-	-7.6	A		
Pulsed Source Current ³	I _{SM}	-	-	-30			
Forward on Voltage ⁴	V _{SD}	-	-	-1.2	V	V _{GS} =0, I _S = -1A, T _J =25°C	

Notes:

- Surface mounted on a 1 inch² FR-4 board with 20Z copper.
- When mounted on Min. copper pad.
- Pulse width limited by maximum junction temperature.
- The data tested by pulsed: pulse width ≤ 300μs, duty cycle ≤ 2%.

N-CHANNEL CHARACTERISTIC CURVE

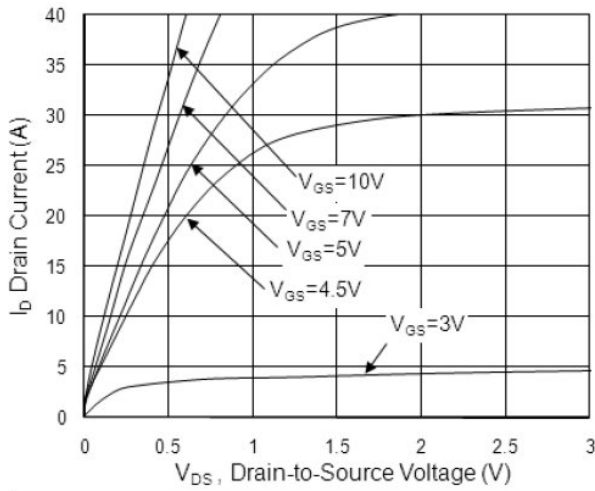


Fig.1 Typical Output Characteristics

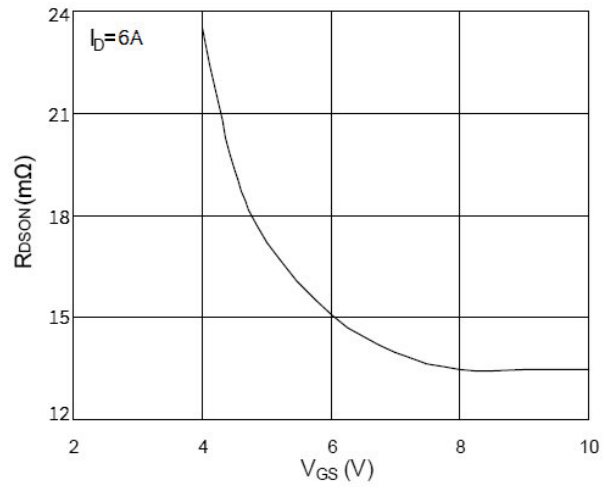


Fig.2 On-Resistance vs. Gate-Source

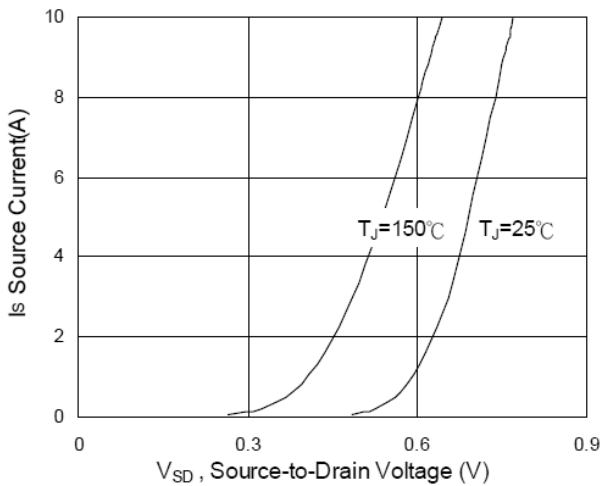


Fig.3 Forward Characteristics Of Reverse

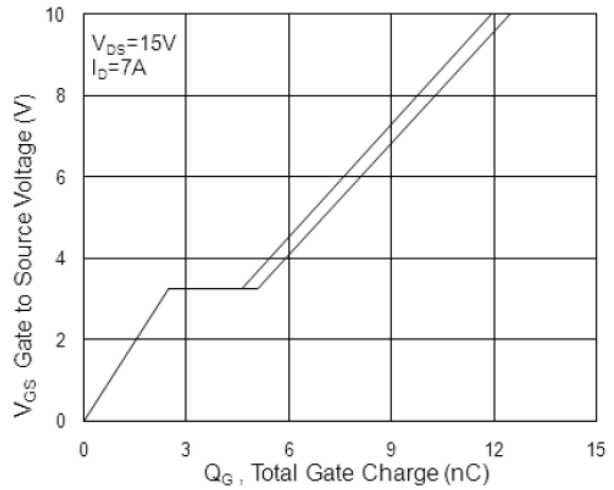


Fig.4 Gate-Charge Characteristics

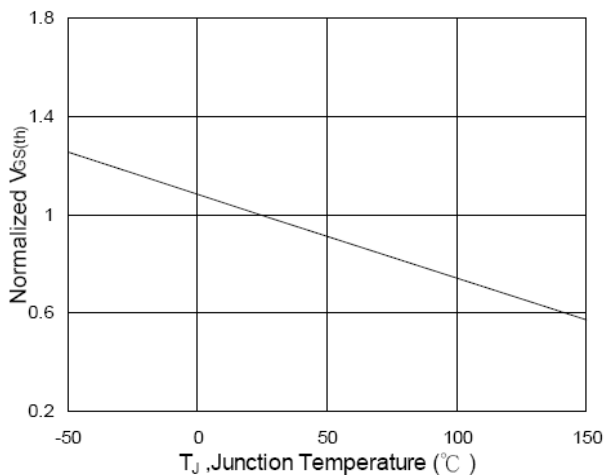


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

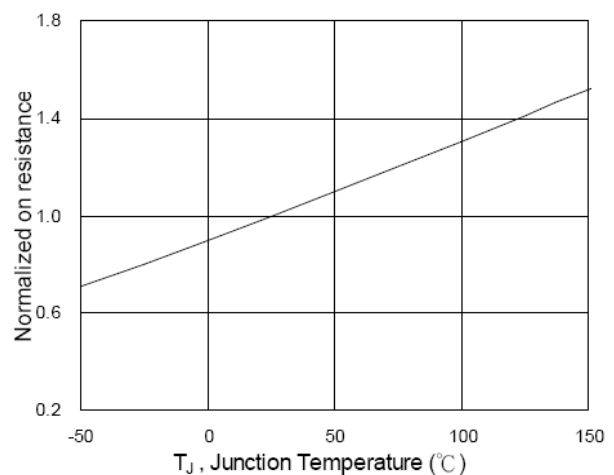


Fig.6 Normalized $R_{DS(ON)}$ vs. T_J

N-CHANNEL CHARACTERISTIC CURVE

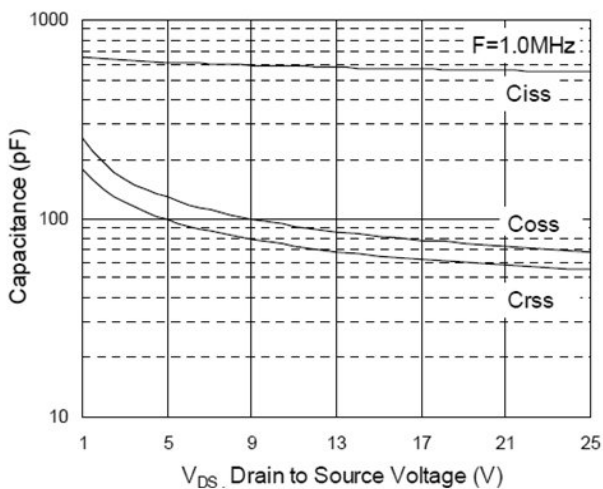


Fig.7 Capacitance

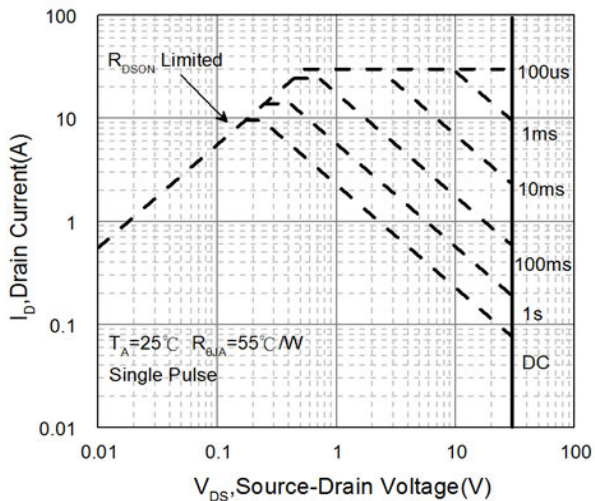


Fig.8 Safe Operating Area

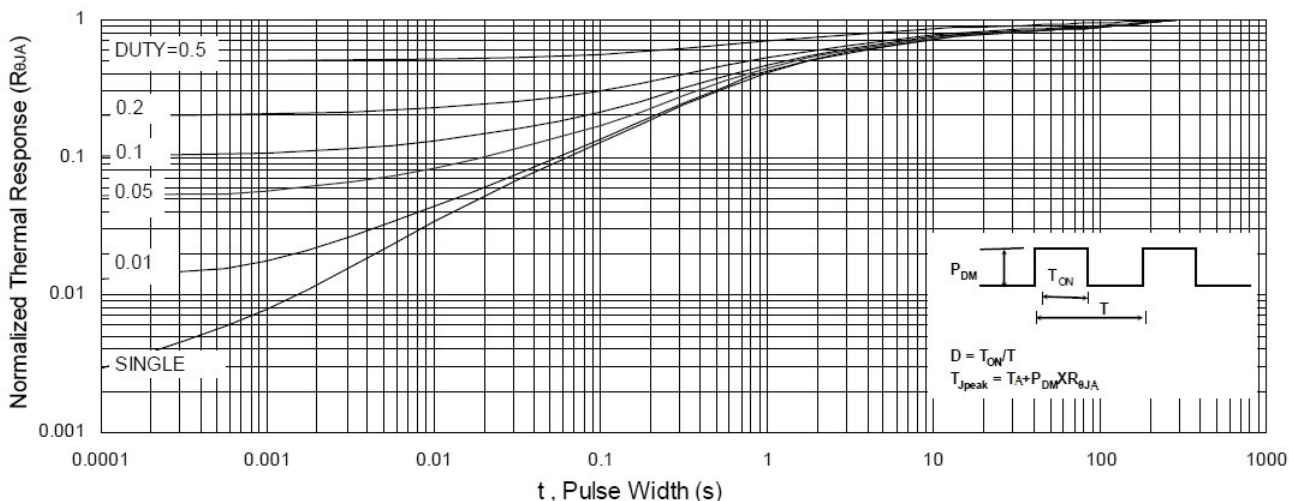


Fig.9 Normalized Maximum Transient Thermal Impedance

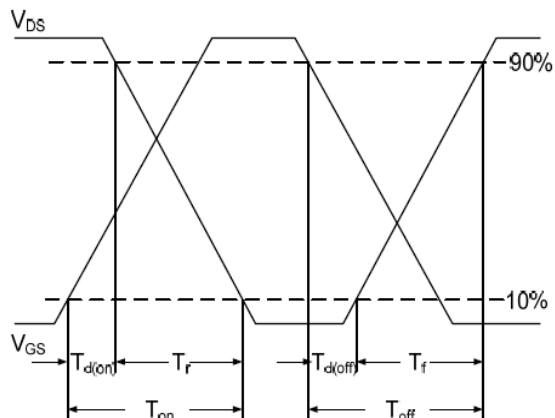


Fig.10 Switching Time Waveform

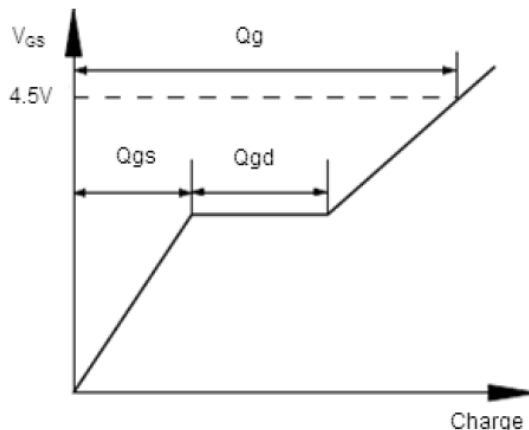


Fig.11 Gate Charge Waveform

P-CHANNEL CHARACTERISTIC CURVE

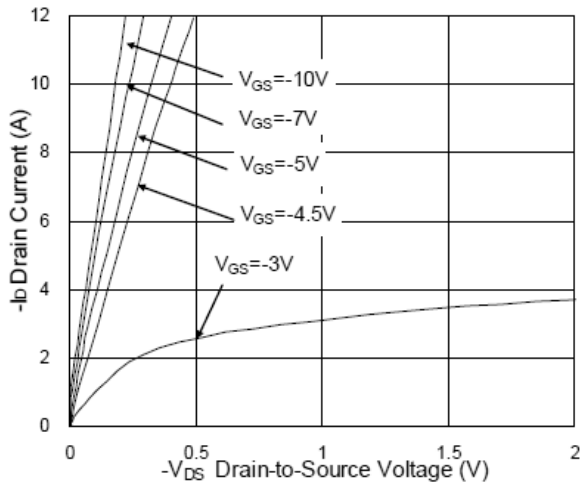


Fig.1 Typical Output Characteristics

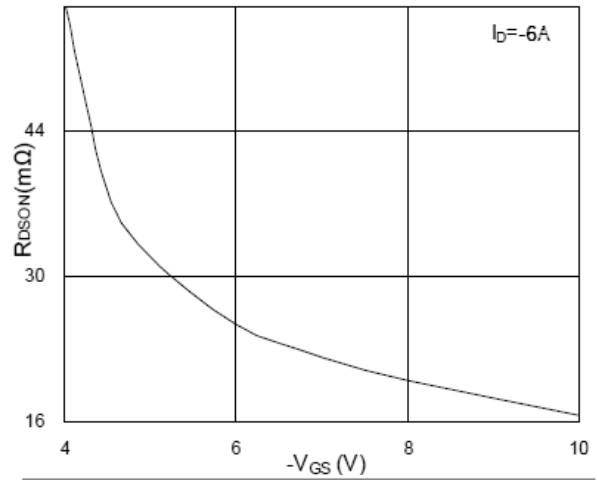


Fig.2 On-Resistance v.s Gate-Source

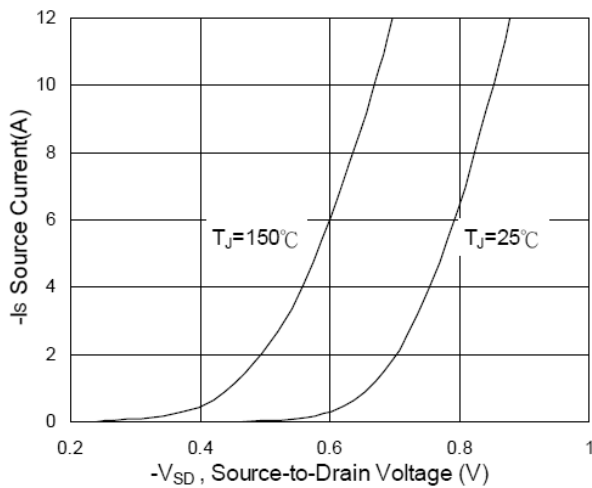


Fig.3 Forward Characteristics of Reverse

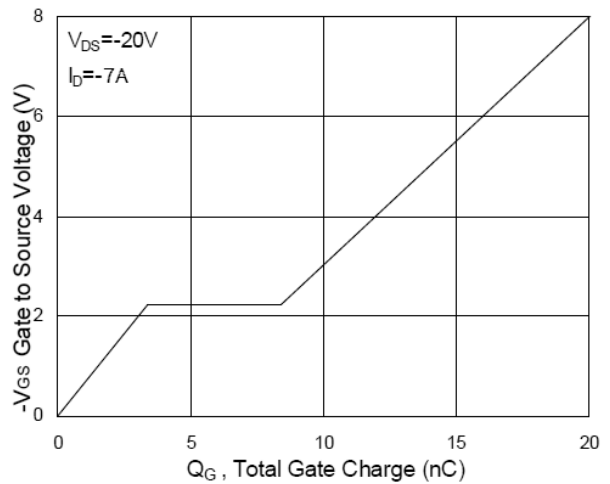


Fig.4 Gate-Charge Characteristics

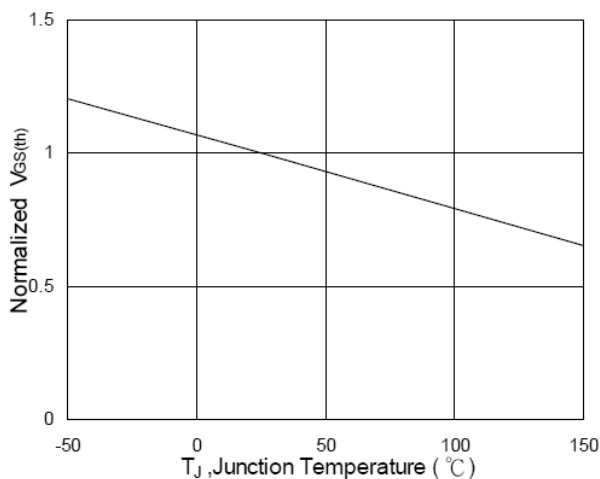


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

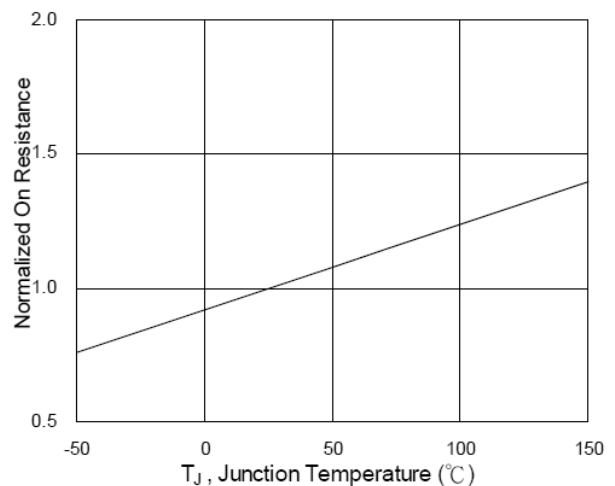


Fig.6 Normalized $R_{DS(ON)}$ v.s T_J

P-CHANNEL CHARACTERISTIC CURVE

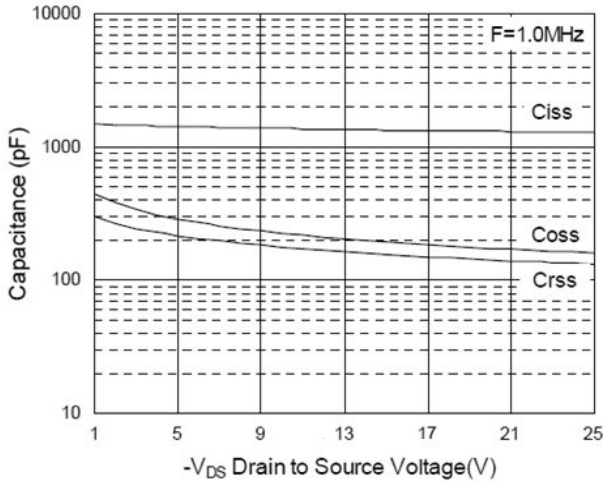


Fig.7 Capacitance

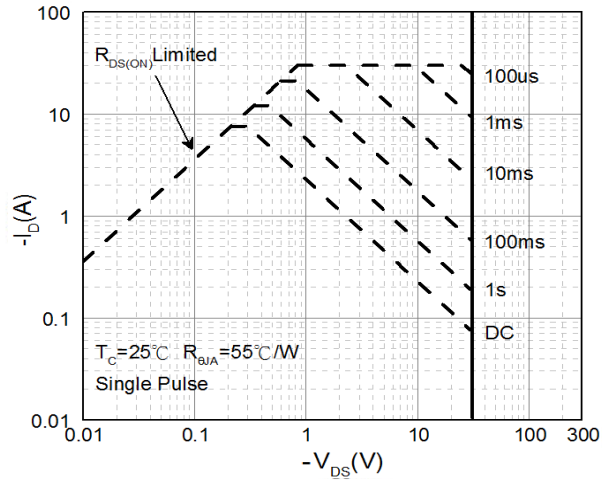


Fig.8 Safe Operating Area

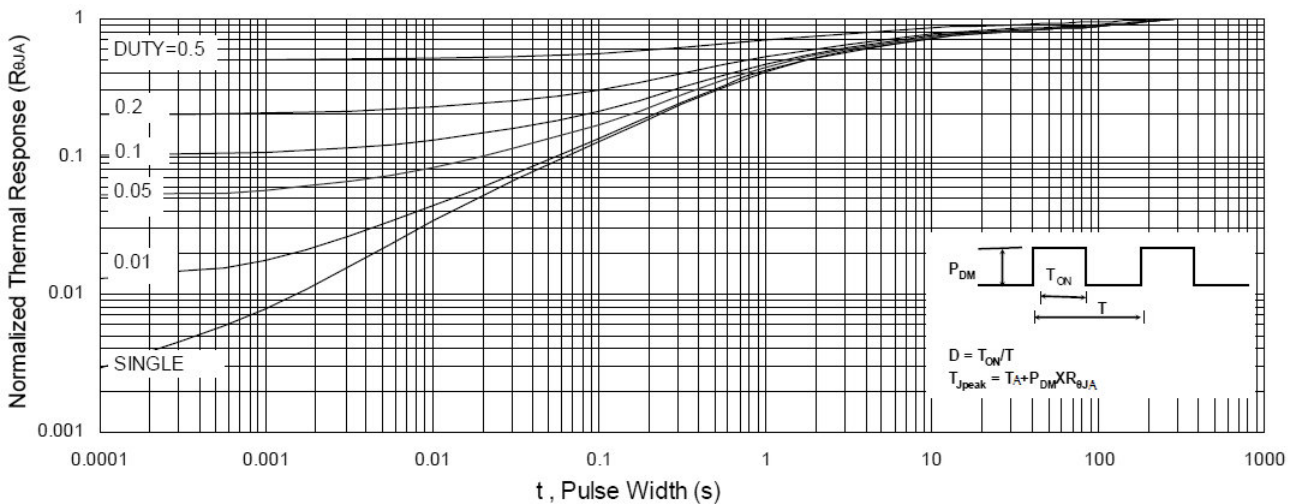


Fig.9 Normalized Maximum Transient Thermal Impedance

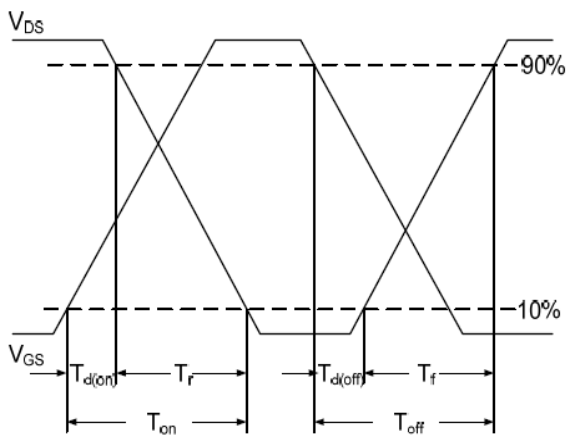


Fig.10 Switching Time Waveform

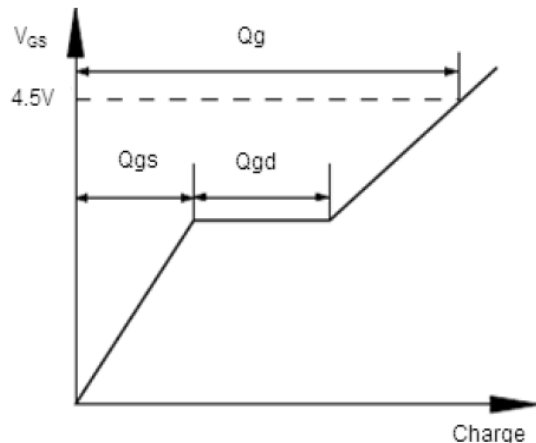


Fig.11 Gate Charge Waveform