

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

DESCRIPTION

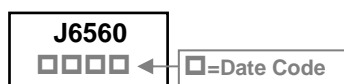
The SSPRDJ6560-C is the highest performance trench N-Ch and P-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SSPRDJ6560-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

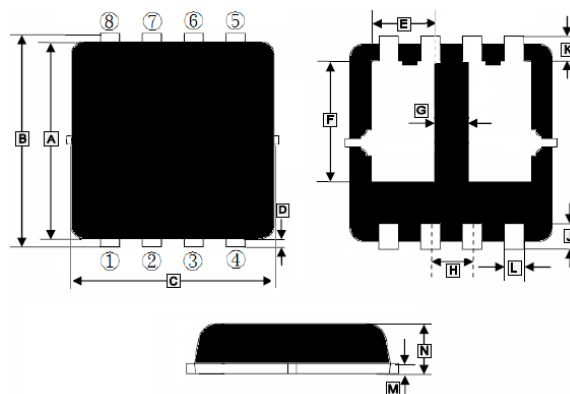
ORDER INFORMATION

Part Number	Type
SSPRDJ6560-C	Lead (Pb)-free and Halogen-free

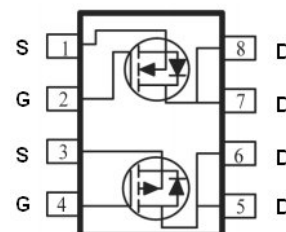
ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings		Unit	
		N-Ch	P-Ch		
Drain-Source Voltage	V_{DS}	60	-60	V	
Gate-Source Voltage	V_{GS}	±20		V	
Continuous Drain Current, @ $V_{GS}=10V$ ¹	I_D	$T_C=25^\circ C$	6.8	-5.1	A
		$T_C=100^\circ C$	4.2	-3.2	
		$T_A=25^\circ C$	4.3	-3.2	
		$T_A=70^\circ C$	2.8	-2	
Pulsed Drain Current ³	I_{DM}	20	-20	A	
Total Power Dissipation	$T_C=25^\circ C$	P_D	3.78	W	
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150		°C	
Thermal Data					
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	84		°C/W	
Thermal Resistance Junction-Ambient ²		135			
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	33			

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			



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}	60	-	-	V	V _{GS} =0, I _D =250μA	
Gate Threshold Voltage	V _{GS(th)}	1	-	2.5	V	V _{DS} =V _{GS} , I _D =250μA	
Forward Transfer Conductance	g _{fs}	-	25.3	-	S	V _{DS} =5V, I _D =4.3A	
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} =48V, V _{GS} =0
		T _J =55°C	-	-	5		
Static Drain-Source On-Resistance ⁴	R _{DS(ON)}	-	-	45	mΩ	V _{GS} =10V, I _D =4.3A	
		-	-	55		V _{GS} =4.5V, I _D =4A	
Total Gate Charge	Q _g	-	19	-	nC	I _D =4.3A V _{DS} =48V V _{GS} =10V	
Gate-Source Charge	Q _{gs}	-	2.5	-			
Gate-Drain ("Miller") Charge	Q _{gd}	-	5	-			
Turn-on Delay Time	T _{d(on)}	-	2.8	-	nS	V _{DS} =30V I _D =1A V _{GS} =10V R _G =3.3Ω	
Rise Time	T _r	-	16.6	-			
Turn-off Delay Time	T _{d(off)}	-	21.2	-			
Fall Time	T _f	-	5.6	-			
Input Capacitance	C _{iss}	-	1027	-	pF	V _{GS} =0 V _{DS} =15V f=1MHz	
Output Capacitance	C _{oss}	-	65	-			
Reverse Transfer Capacitance	C _{rss}	-	46	-			
Source-Drain Diode							
Continuous Source Current ¹	I _S	-	-	4.3	A		
Pulsed Source Current ³	I _{SM}	-	-	20			
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	BV _{DSS}	-60	-	-	V	V _{GS} =0, I _D = -250μA	
Gate Threshold Voltage	V _{GS(th)}	-1	-	-2.5	V	V _{DS} =V _{GS} , I _D = -250μA	
Forward Transfer Conductance	g _{fs}	-	8.7	-	S	V _{DS} = -5V, I _D = -3.2A	
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} = -48V, V _{GS} =0
		T _J =55°C	-	-	-5		
Static Drain-Source On-Resistance ⁴	R _{DS(ON)}	-	-	82	mΩ	V _{GS} = -10V, I _D = -3.2A	
		-	-	102		V _{GS} = -4.5V, I _D = -3A	
Total Gate Charge	Q _g	-	11.8	-	nC	I _D = -3.2A V _{DS} = -20V V _{GS} = -4.5V	
Gate-Source Charge	Q _{gs}	-	1.9	-			
Gate-Drain ("Miller") Charge	Q _{gd}	-	6.5	-			
Turn-on Delay Time	T _{d(on)}	-	8.8	-	nS	V _{DS} = -15V I _D = -1A V _{GS} = -10V R _G =3.3Ω	
Rise Time	T _r	-	19.6	-			
Turn-off Delay Time	T _{d(off)}	-	47.2	-			
Fall Time	T _f	-	9.6	-			
Input Capacitance	C _{iss}	-	1080	-	pF	V _{GS} =0 V _{DS} = -15V f=1MHz	
Output Capacitance	C _{oss}	-	97	-			
Reverse Transfer Capacitance	C _{rss}	-	50	-			
Source-Drain Diode							
Continuous Source Current ¹	I _S	-	-	-3.2	A		
Pulsed Source Current ³	I _{SM}	-	-	-20			
Forward on Voltage ⁴	V _{SD}	-	-	-1.2	V	V _{GS} =0, I _S = -1A, T _J =25°C	

Notes:

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

N-CHANNEL CHARACTERISTIC CURVE

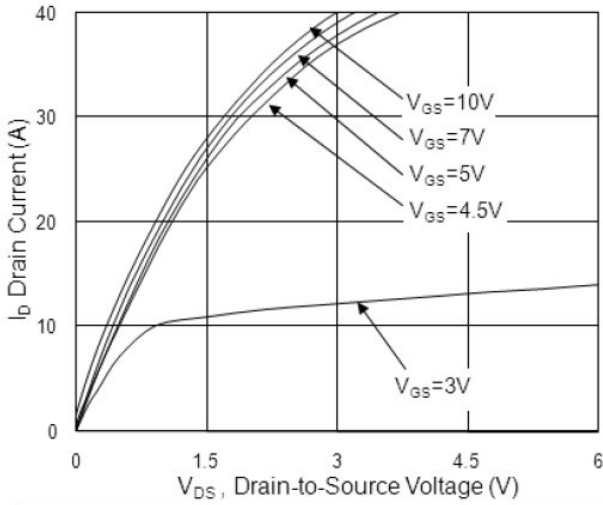


Fig.1 Typical Output Characteristics

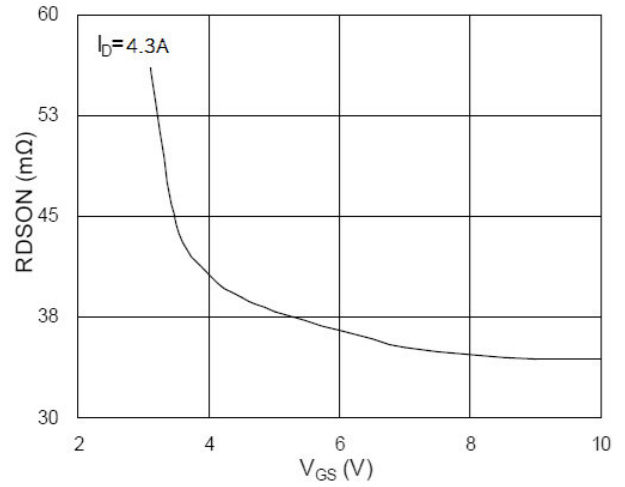


Fig.2 On-Resistance vs. Gate-Source

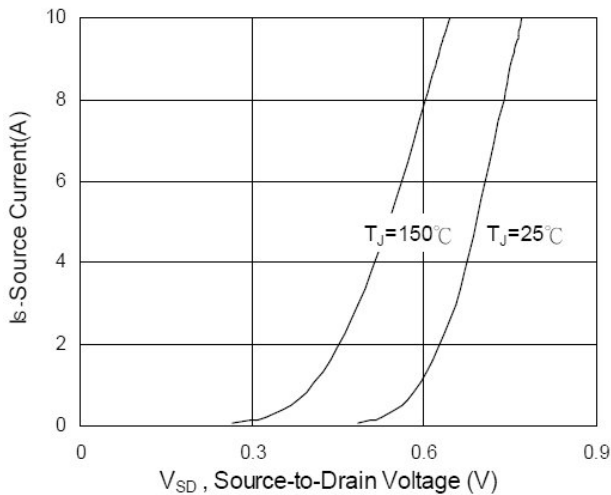


Fig.3 Forward Characteristics Of Reverse

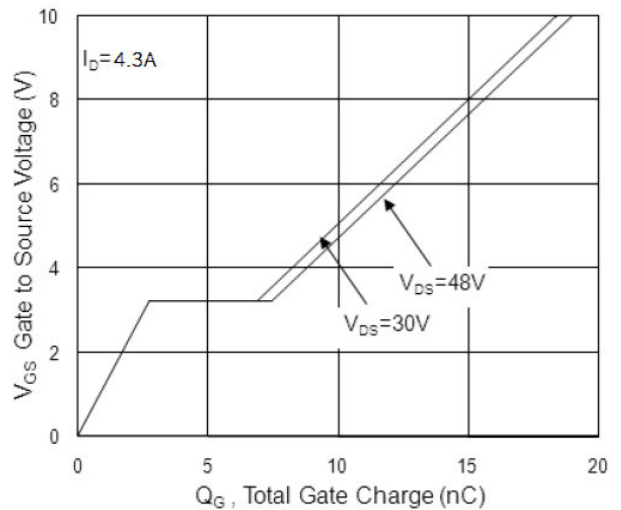


Fig.4 Gate-Charge Characteristics

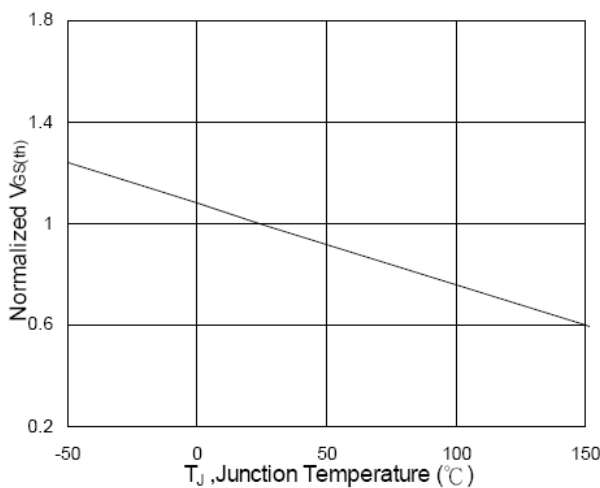


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

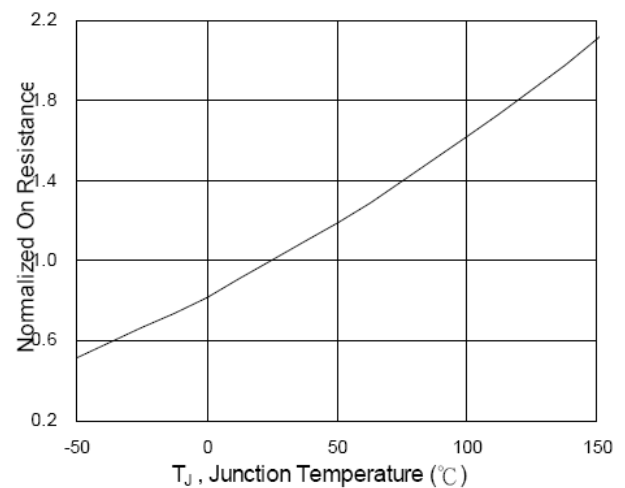


Fig.6 Normalized $R_{DS(ON)}$ vs. T_J

N-CHANNEL CHARACTERISTIC CURVE

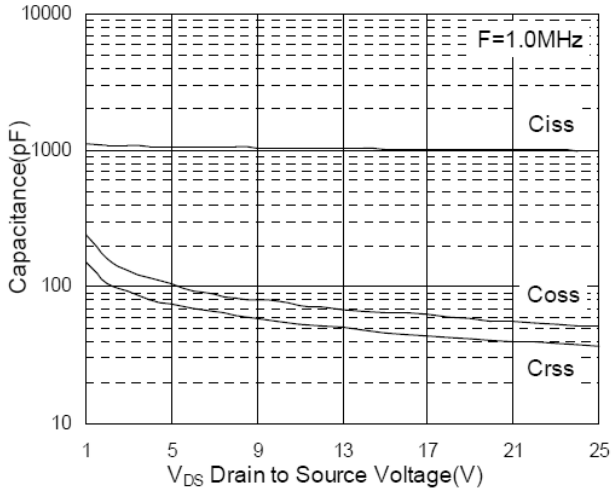


Fig.7 Capacitance

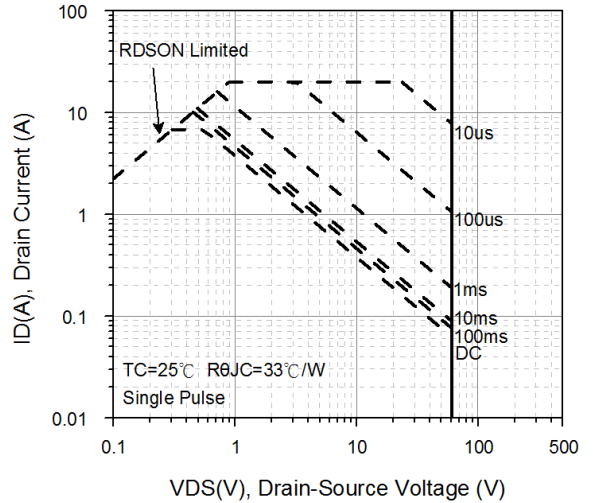


Fig.8 Safe Operating Area

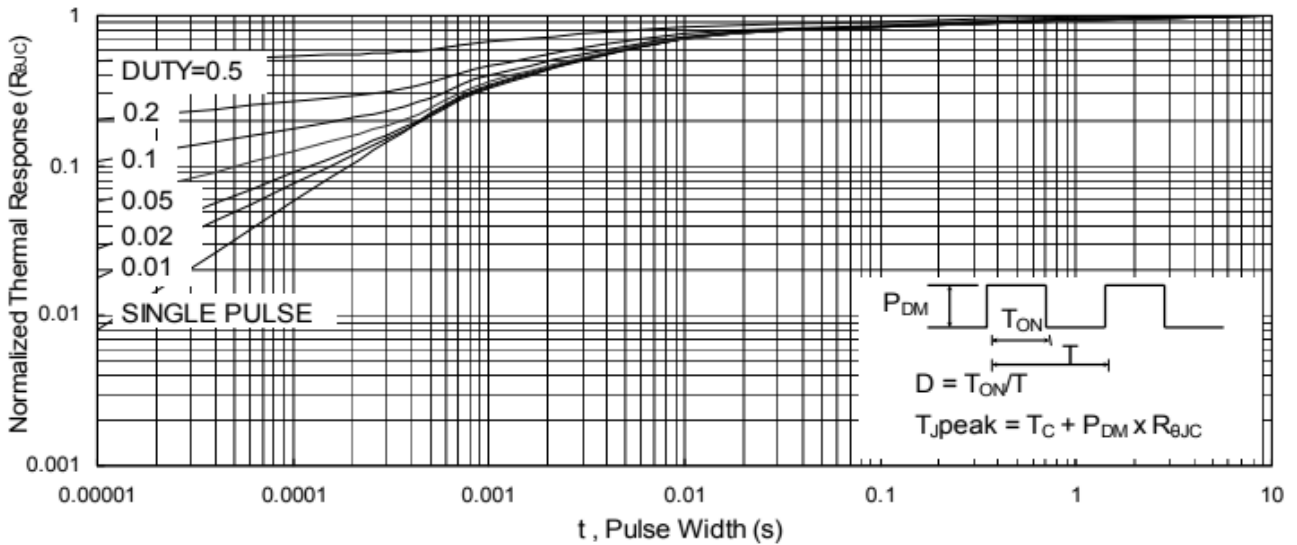


Fig.9 Normalized Maximum Transient Thermal Impedance

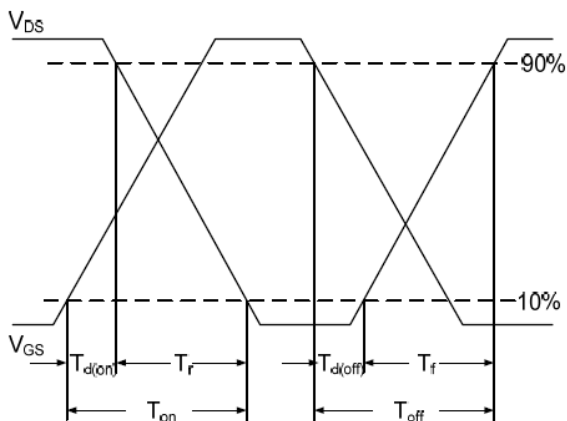


Fig.10 Switching Time Waveform

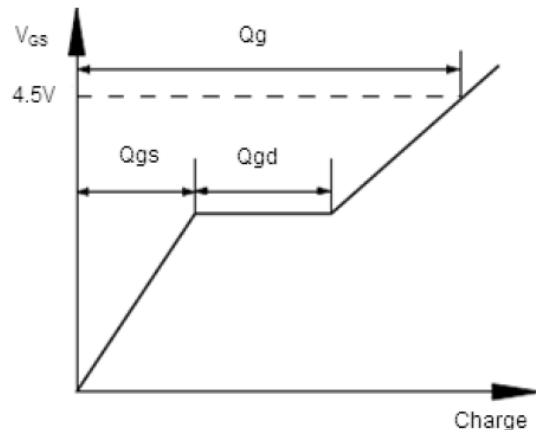


Fig.11 Gate Charge Waveform

P-CHANNEL CHARACTERISTIC CURVE

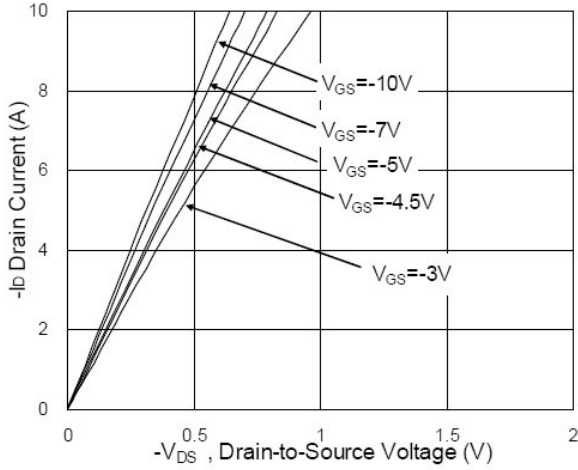


Fig.1 Typical Output Characteristics

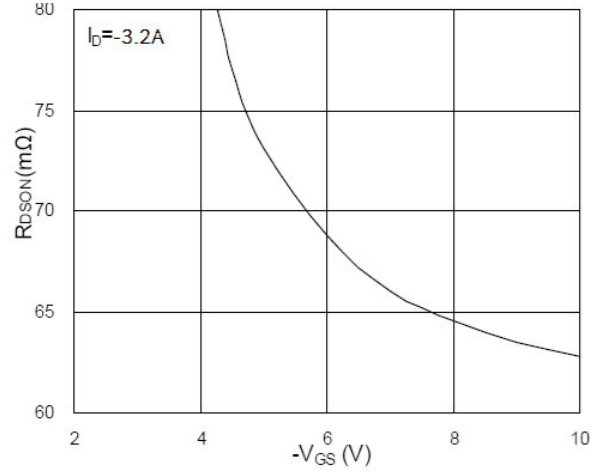


Fig.2 On-Resistance v.s Gate-Source

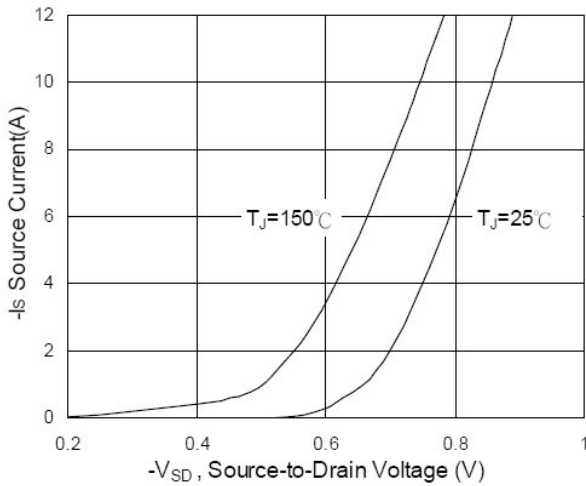


Fig.3 Forward Characteristics of Reverse

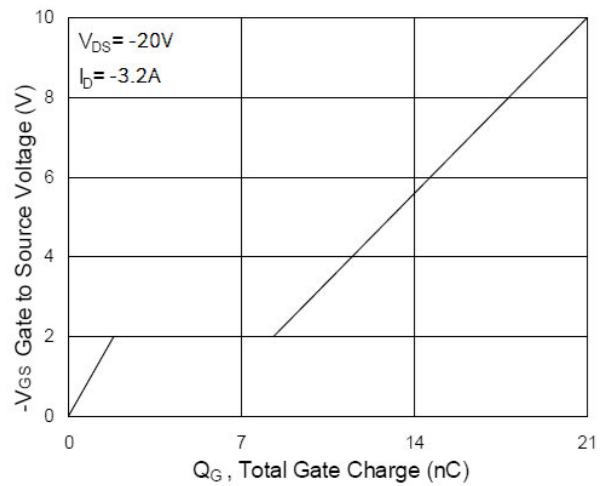


Fig.4 Gate-Charge Characteristics

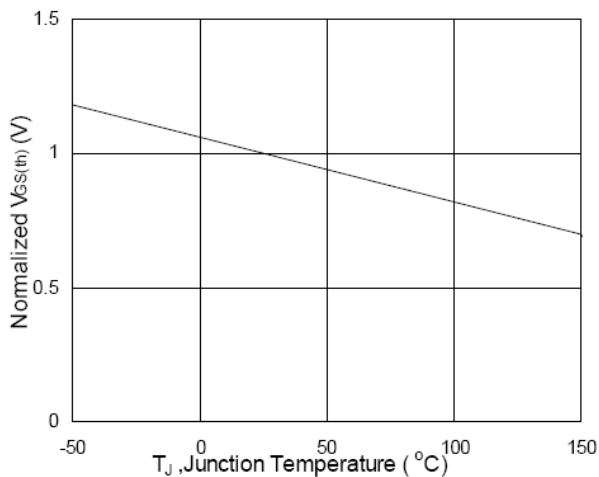


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

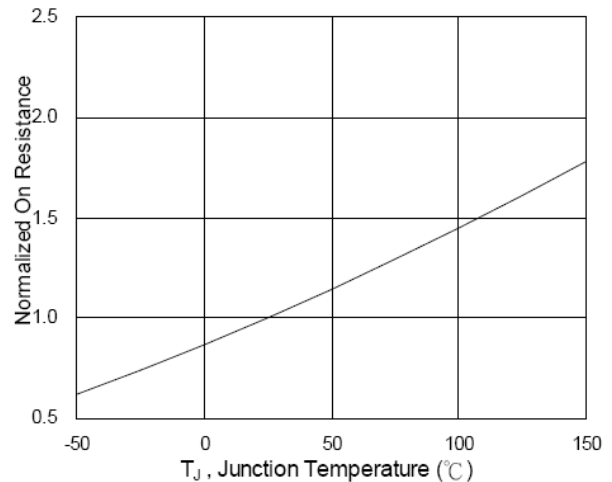


Fig.6 Normalized $R_{DS(ON)}$ v.s T_J

P-CHANNEL CHARACTERISTIC CURVE

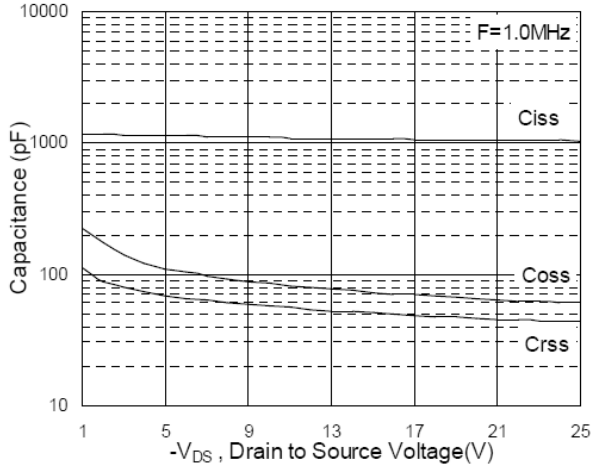


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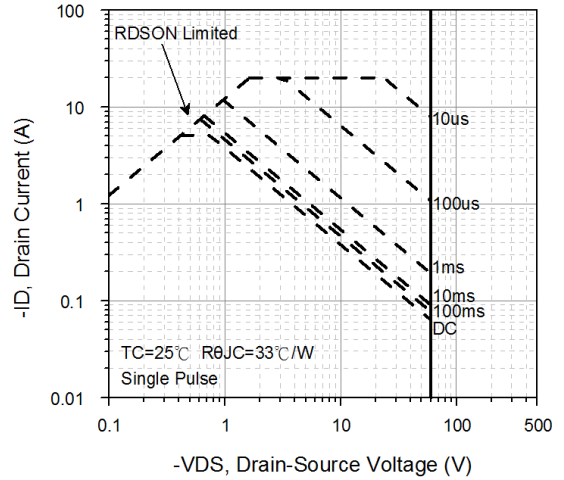


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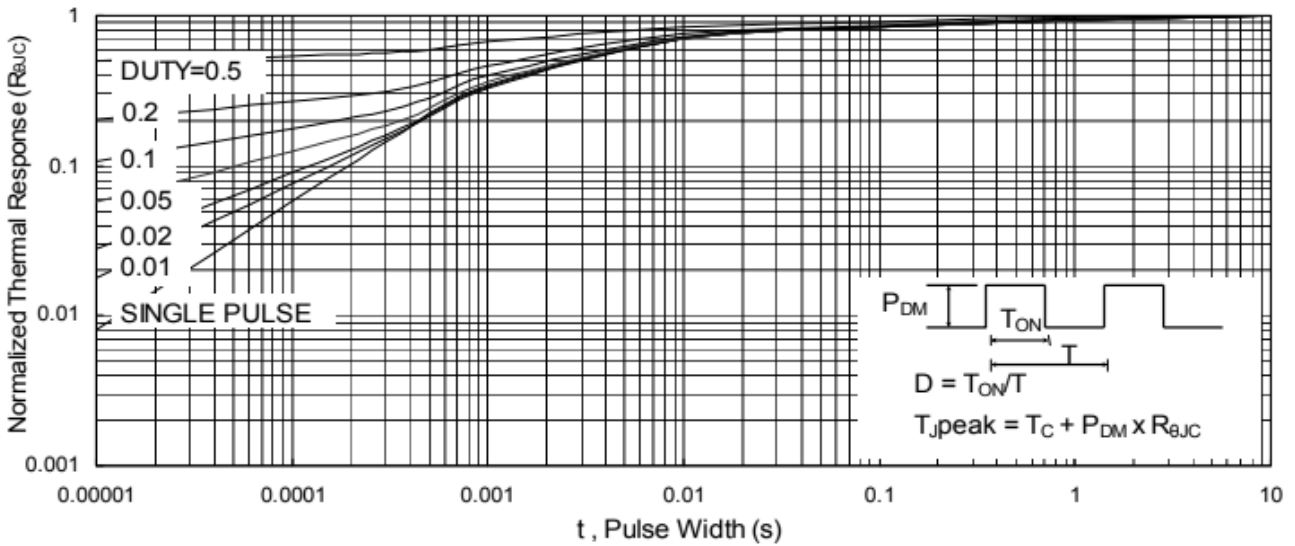


Fig.9 Normalized Maximum Transient Thermal Impedance

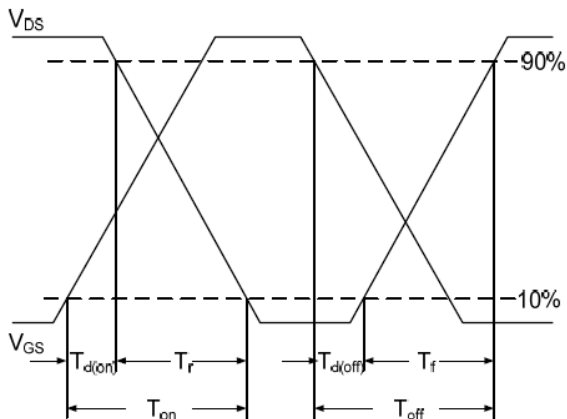


Fig.10 Switching Time Waveform

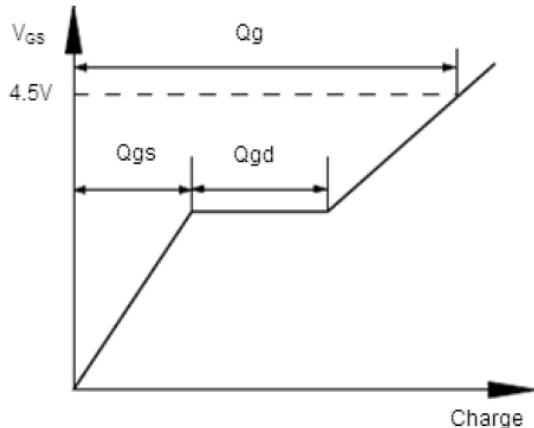


Fig.11 Gate Charge Waveform