

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

DESCRIPTION

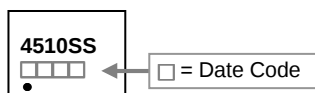
The SSG4510 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

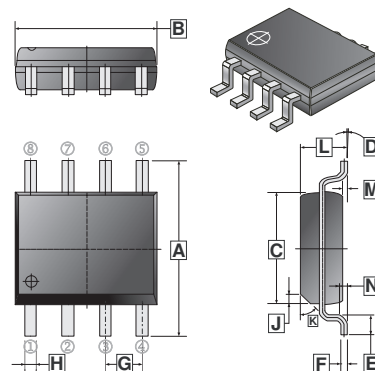
FEATURES

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

MARKING



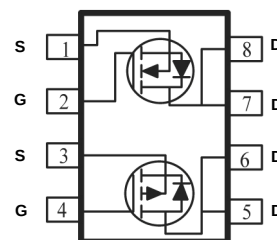
SOP-8



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	H	0.35	0.49
B	4.80	5.00	J	0.375	REF.
C	3.80	4.00	K	45°	
D	0°	8°	L	1.35	1.75
E	0.40	0.90	M	0.10	0.25
F	0.19	0.25	N	0.25	REF.
G	1.27	TYP.			

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	2.5K	13 inch



ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Ratings		Unit
			N-Ch	P-Ch	
Drain-Source Voltage		V _{DS}	100	-100	V
Gate-Source Voltage		V _{GS}	±20	±20	V
Continuous Drain Current ³	T _A =25°C	I _D	2.5	-2.5	A
	T _A =70°C		2	-2	A
Pulsed Drain Current ¹		I _{DM}	10	-10	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 ³		R _{θJA}	62.5		°C / W

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}	100	-	-	V	V _{GS} =0, I _D =250μA
Gate Threshold Voltage		V _{GS(th)}	1.0	-	2.5	V	V _{DS} =V _{GS} , I _D =250μA
Forward Transconductance		g _{fs}	-	20	-	S	V _{DS} =5V, I _D =2A
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} =80V, V _{GS} =0
	T _J =55°C		-	-	5		
Static Drain-Source On-Resistance ²		R _{DS(ON)}	-	-	112	mΩ	V _{GS} =10V, I _D =2A
			-	-	120		V _{GS} =4.5V, I _D =1A
Total Gate Charge ²		Q _g	-	26.2	-	nC	I _D =2A V _{DS} =80V V _{GS} =10V
Gate-Source Charge		Q _{gs}	-	3.8	-		
Gate-Drain (“Miller”) Change		Q _{gd}	-	4.8	-		
Turn-on Delay Time ²		T _{d(on)}	-	4.2	-	nS	V _{DS} =50V V _{GS} =10V I _D =2A R _G =3.3Ω R _D =15Ω
Rise Time		T _r	-	7.6	-		
Turn-off Delay Time		T _{d(off)}	-	41	-		
Fall Time		T _f	-	14	-		
Input Capacitance		C _{iss}	-	1535	-	pF	V _{GS} =0 V _{DS} =15V f=1.0MHz
Output Capacitance		C _{oss}	-	60	-		
Reverse Transfer Capacitance		C _{rss}	-	37	-		
Source-Drain Diode							
Forward On Voltage ²		V _{SD}	-	-	1.2	V	I _S =1A, V _{GS} =0
Continuous Source Current(Body Diode)		I _S	-	-	2.5	A	V _D = V _G =0, V _S =1.2V
Pulsed Source Current(Body Diode) ¹		I _{SM}	-	-	10	A	

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Surface mounted on 1 in² copper pad of FR4 board; 135 $^\circ\text{C}/\text{W}$ when mounted on Min. copper pad.

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

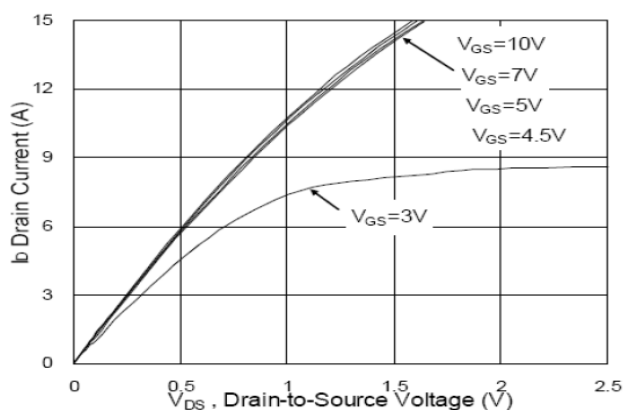
Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV _{DSS}	-100	-	-	V	V _{GS} =0, I _D = -250μA
Gate Threshold Voltage		V _{GS(th)}	-1	-	-2.5	V	V _{DS} =V _{GS} , I _D = -250μA
Forward Transconductance		g _{fs}	-	7	-	S	V _{DS} = -5V, I _D = -2A
Gate-Source Leakage Current		I _{GSS}	-	-	±100	nA	V _{GS} =±20V
Drain-Source Leakage Current	T _J =25°C	I _{DSS}	-	-	-1	μA	V _{DS} = -80V, V _{GS} =0
	T _J =55°C		-	-	-5		
Static Drain-Source On-Resistance ²		R _{DS(ON)}	-	-	180	mΩ	V _{GS} = -10V, I _D = -2A
			-	-	210		V _{GS} = -4.5V, I _D = -1A
Total Gate Charge ²		Q _g	-	31	-	nC	I _D = -1.5A V _{DS} = -80V V _{GS} = -10V
Gate-Source Charge		Q _{gs}	-	6.3	-		
Gate-Drain (“Miller”) Change		Q _{gd}	-	4.5	-		
Turn-on Delay Time ²		T _{d(on)}	-	12	-	nS	V _{DS} = -50V V _{GS} = -10V I _D = -1A R _G =3.3Ω R _D =15Ω
Rise Time		T _r	-	55	-		
Turn-off Delay Time		T _{d(off)}	-	40	-		
Fall Time		T _f	-	40	-		
Input Capacitance		C _{iss}	-	1066	-	pF	V _{GS} =0 V _{DS} = -20V f=1.0MHz
Output Capacitance		C _{oss}	-	365	-		
Reverse Transfer Capacitance		C _{rss}	-	55	-		
Source-Drain Diode							
Forward On Voltage ²		V _{SD}	-	-	-1.2	V	I _S = -1A, V _{GS} =0V
Continuous Source Current(Body Diode)		I _S	-	-	-2.5	A	V _D = V _G =0V, V _S = -1.2V
Pulsed Source Current(Body Diode) ¹		I _{SM}	-	-	-10	A	

Notes:

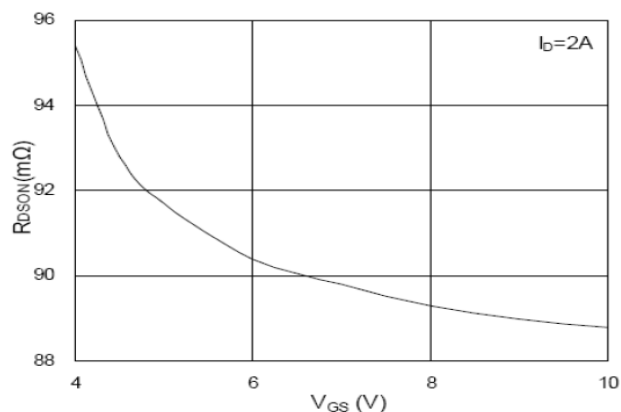
1. Pulse width limited by Max. junction temperature.
2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Surface mounted on 1 in2 copper pad of FR4 board; 135°C/W when mounted on Min. copper pad.

CHARACTERISTIC CURVE (N-Ch)

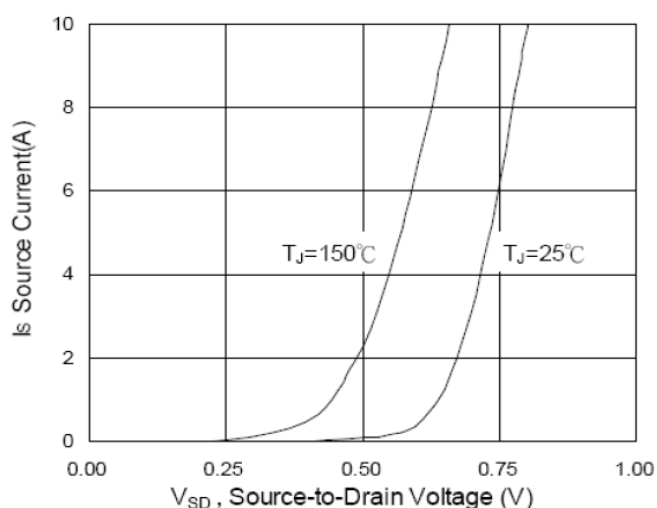
Typical Output characteristics



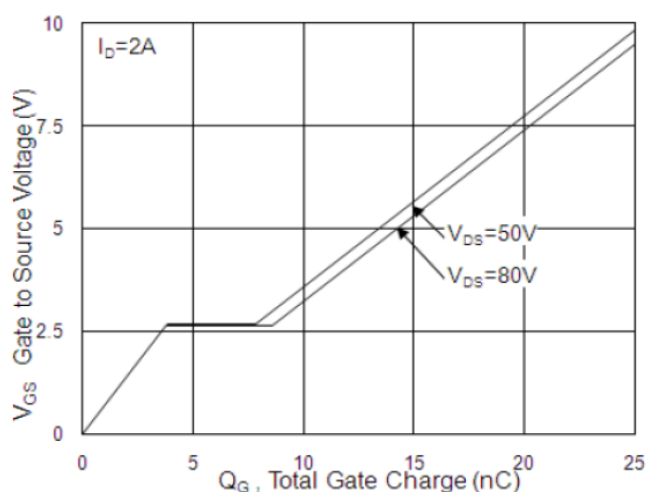
On-Resistance VS. Gate-Source



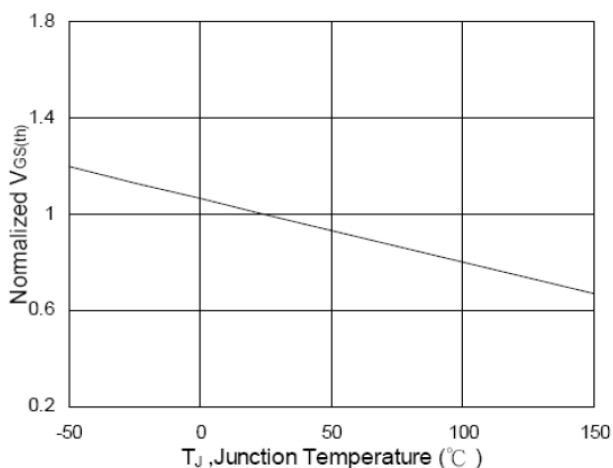
Forward Characteristics Of Reverse



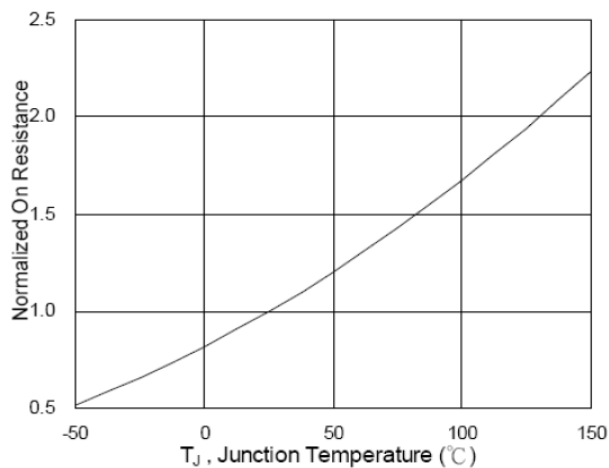
Gate-Charge Characteristics



Normalized $V_{GS(th)}$ VS. T_J

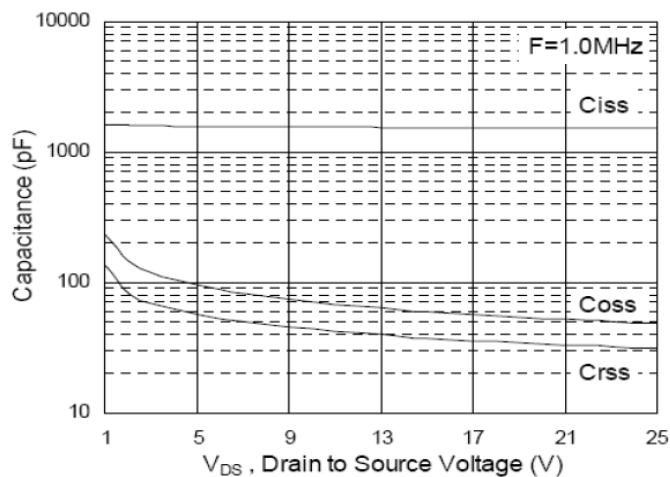


Normalized $R_{DS(on)}$ VS. T_J

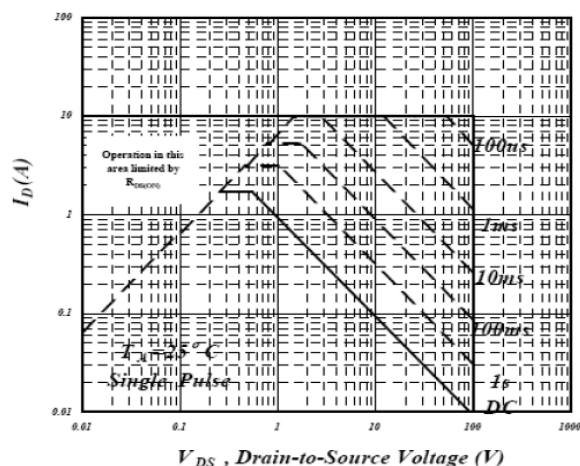


CHARACTERISTIC CURVE (N-Ch)

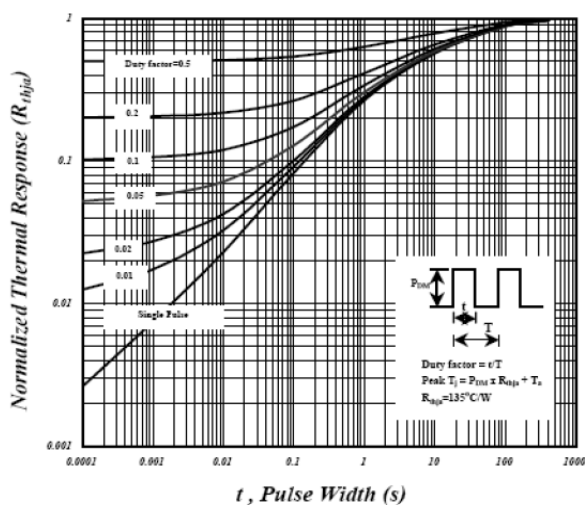
Capacitance



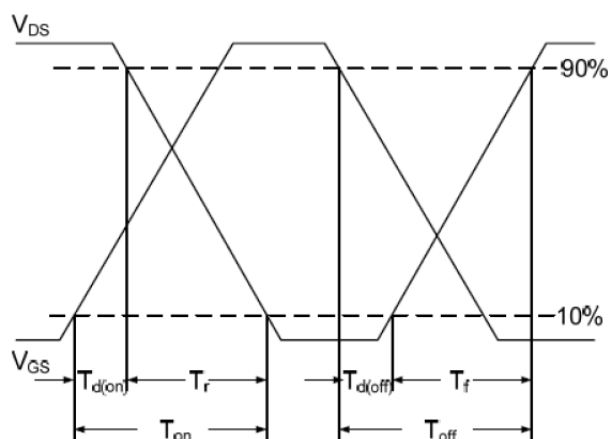
Safe Operating Area



Normalized Maximum Transient Thermal Impedance

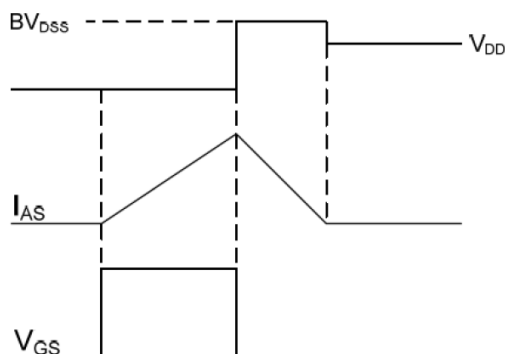


Switching Time Waveform



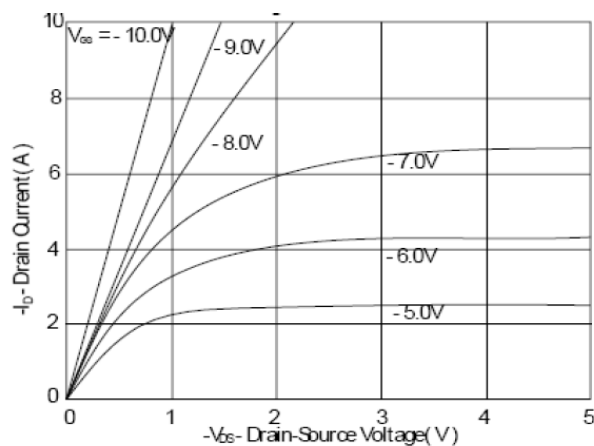
Unclamped Inductive Switching Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

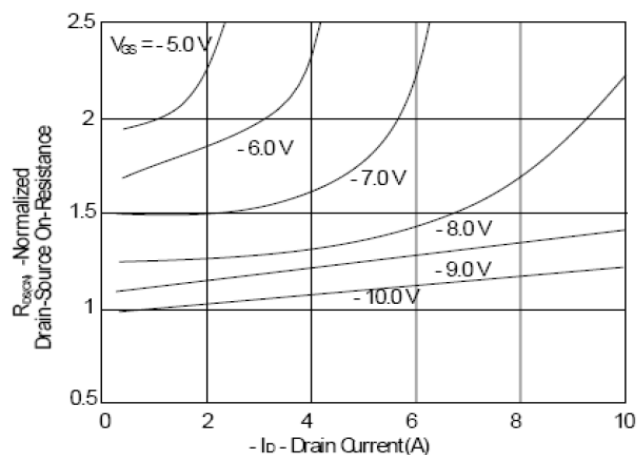


CHARACTERISTIC CURVE (P-Ch)

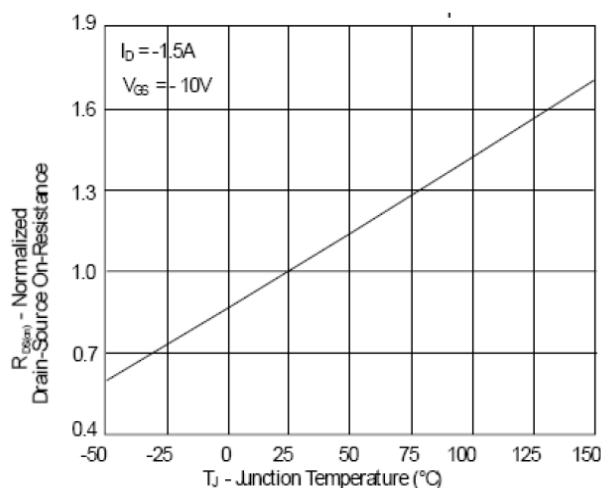
On-Region Characteristics



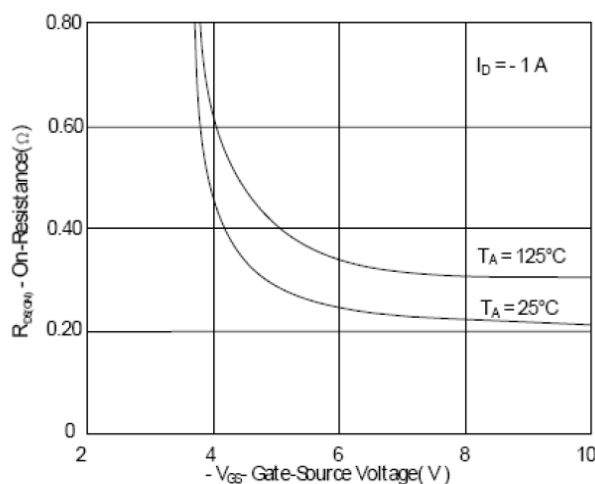
On-Resistance Variation with Drain Current and Gate Voltage



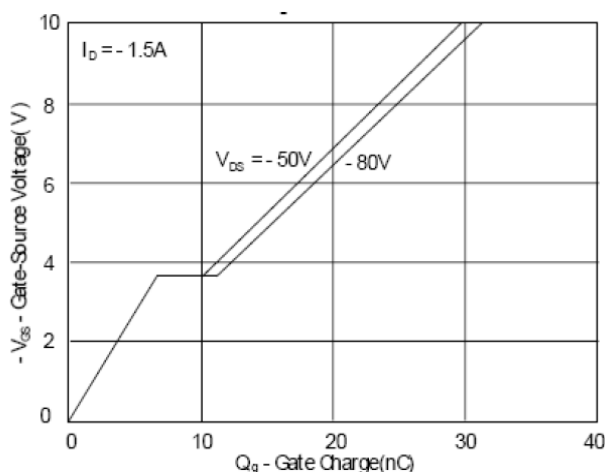
On-Resistance Variation with Temperature



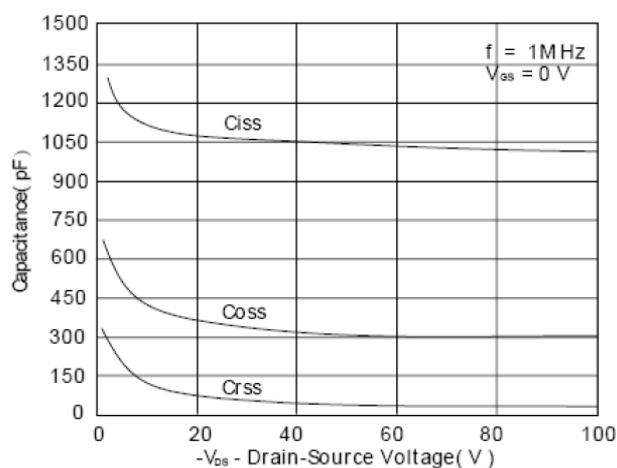
On-Resistance Variation with Gate-Source Voltage



Gate Charge Characteristics

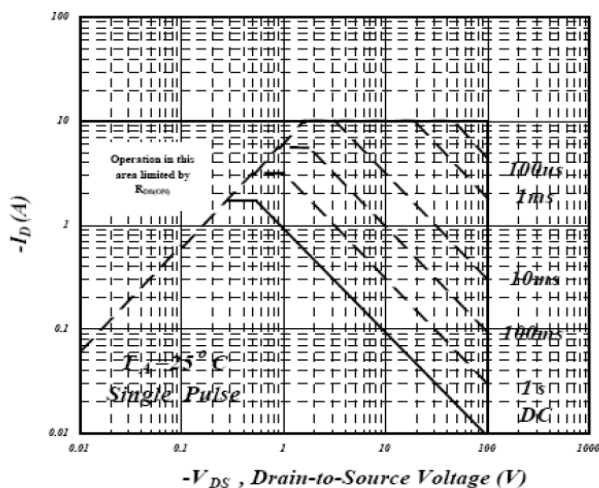


Capacitance Characteristics

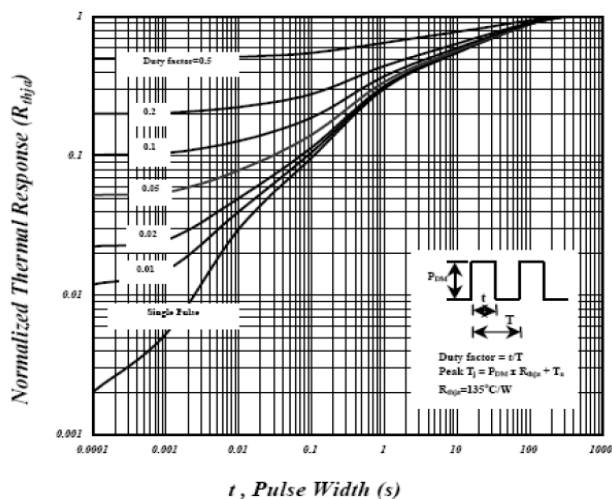


CHARACTERISTIC CURVE (P-Ch)

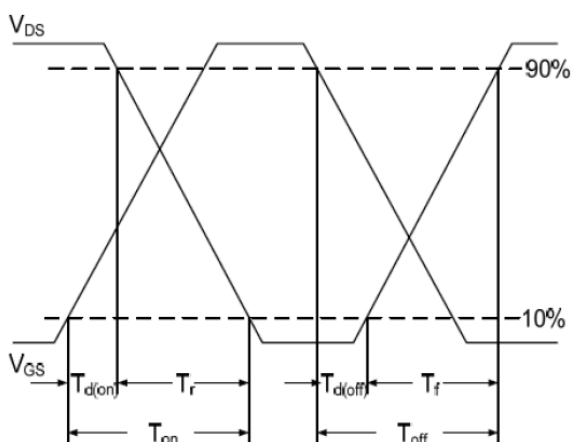
Maximum Safe Operating Area



Transient Thermal Response Curve



Switching Time Waveform



Unclamped Inductive Switching Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

