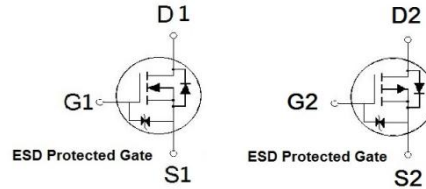




PRODUCT SUMMARY

	$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
N-Channel	20V	300m Ω	0.96A
P-Channel	-20V	520m Ω	-0.68A

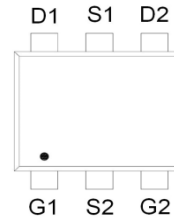


Features

- Pb-Free, Halogen Free and RoHS compliant.
- Low $R_{DS(on)}$ to Minimize Conduction Losses.
- Ohmic Region Good $R_{DS(on)}$ Ratio.
- Optimized Gate Charge to Minimize Switching Losses.
- ESD Protection – HBM Class : 1C.

Applications

- Protection Circuits Applications.
- Logic/Load Switch Circuits Applications.



G : GATE
D : DRAIN
S : SOURCE

ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ }^\circ\text{C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	N-Channel	P-Channel	UNITS
Drain-Source Voltage		V_{DS}	20	-20	V
Gate-Source Voltage		V_{GS}	± 10	± 12	V
Continuous Drain Current	$T_A = 25\text{ }^\circ\text{C}$	I_D	0.96	-0.68	A
	$T_A = 70\text{ }^\circ\text{C}$		0.76	-0.54	
Pulsed Drain Current ¹		I_{DM}	3	-2.1	
Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	P_D	0.49	0.41	W
	$T_A = 70\text{ }^\circ\text{C}$		0.31	0.26	
Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL		TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient ²	R _{θJA}	N-ch		251	°C / W
Junction-to-Ambient ²	R _{θJA}	P-ch		300	

¹Pulse width limited by maximum junction temperature.

²The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C.

ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT	
			MIN	TYP	MAX		
STATIC							
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	N-Ch	20		V	
		V _{GS} = 0V, I _D = -250μA	P-Ch	-20			
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	N-Ch	0.4	0.7	1	V
		V _{DS} = V _{GS} , I _D = -250μA	P-Ch	-0.4	-0.65	-1.2	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±8V	N-Ch			±30	uA
		V _{DS} = 0V, V _{GS} = ±10V	P-Ch			±30	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16V, V _{GS} = 0V	N-Ch			1	μA
		V _{DS} = -16V, V _{GS} = 0V	P-Ch			-1	
		V _{DS} = 10V, V _{GS} = 0V, T _J = 55 °C	N-Ch			10	
		V _{DS} = -10V, V _{GS} = 0V, T _J = 55 °C	P-Ch			-10	
Drain-Source On-State Resistance ¹	R _{DS(ON)}	V _{GS} = 4.5V, I _D = 0.5A	N-Ch		146	300	mΩ
		V _{GS} = -4.5V, I _D = -0.45A	P-Ch		442	520	
		V _{GS} = 2.5V, I _D = 0.25A	N-Ch		188	400	
		V _{GS} = -2.5V, I _D = -0.1A	P-Ch		618	800	
Forward Transconductance ¹	g _{fs}	V _{DS} = 5V, I _D = 0.5A	N-Ch		2.5		S
		V _{DS} = -5V, I _D = -0.45A	P-Ch		1		

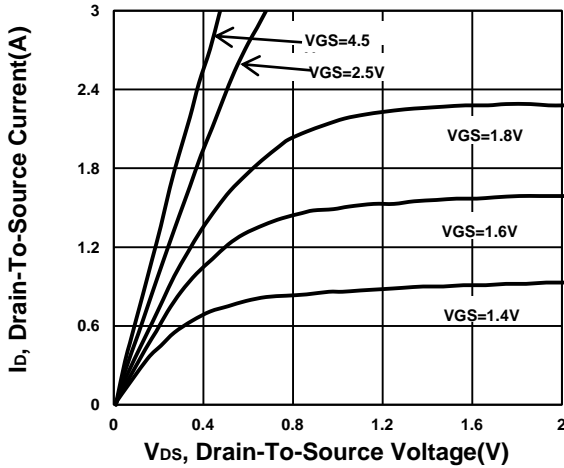
DYNAMIC							
Input Capacitance	C_{iss}	N-Channel $V_{GS} = 0V, V_{DS} = 10V, f = 1MHz$	N-Ch		59		pF
			P-Ch		46		
Output Capacitance	C_{oss}	P-Channel $V_{GS} = 0V, V_{DS} = -10V, f = 1MHz$	N-Ch		18		pF
			P-Ch		18		
Reverse Transfer Capacitance	C_{rss}		N-Ch		9.7		
			P-Ch		9.6		
Total Gate Charge ²	Q_g	N-Channel $V_{DS} = 20V,$	N-Ch		1.4		nC
			P-Ch		1.1		
Gate-Source Charge ²	Q_{gs}	P-Channel $V_{DS} = -20V,$	N-Ch		0.1		nC
			P-Ch		0.2		
Gate-Drain Charge ²	Q_{gd}	N-Channel $I_D \cong 1A, V_{GS} = 4.5V,$	N-Ch		0.3		
			P-Ch		0.3		
Turn-On Delay Time ²	$t_{d(on)}$	P-Channel $I_D \cong -1A, V_{GS} = -4.5V,$	N-Ch		17		nS
			P-Ch		17		
Rise Time ²	t_r	N-Channel $V_{DS} = 10V,$	N-Ch		36		nS
			P-Ch		30		
Turn-Off Delay Time ²	$t_{d(off)}$	P-Channel $I_D \cong 0.5A, V_{GS} = 4.5V,$	N-Ch		86		nS
			P-Ch		76		
Fall Time ²	t_f	N-Channel $R_{GEN} = 5.1\Omega$	N-Ch		173		
			P-Ch		46		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$)							
Continuous Current	I_S		N-Ch		0.4		A
			P-Ch		-0.34		
Forward Voltage ¹	V_{SD}	$I_F = 0.5A, V_{GS} = 0V$	N-Ch		1.2		V
			P-Ch		-1.2		
Reverse Recovery Time	t_{rr}	$I_F = 1A, di_F/dt = 100A / \mu S$	N-Ch		111		nS
			P-Ch		46		
Reverse Recovery Charge	Q_{rr}	$I_F = -1A, di_F/dt = 100A / \mu S$	N-Ch		102		nC
			P-Ch		28		

¹Pulse test : Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.

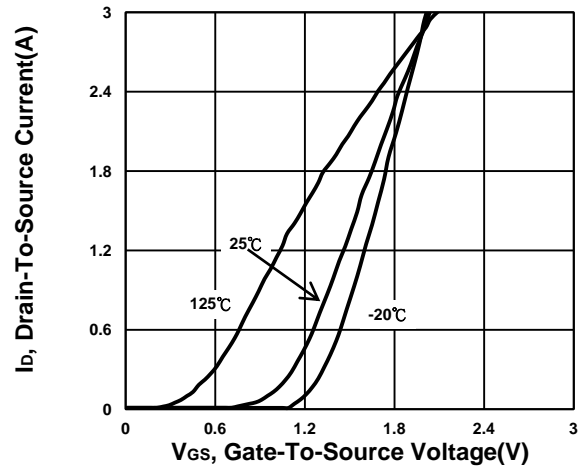
²Independent of operating temperature.

N-CHANNEL

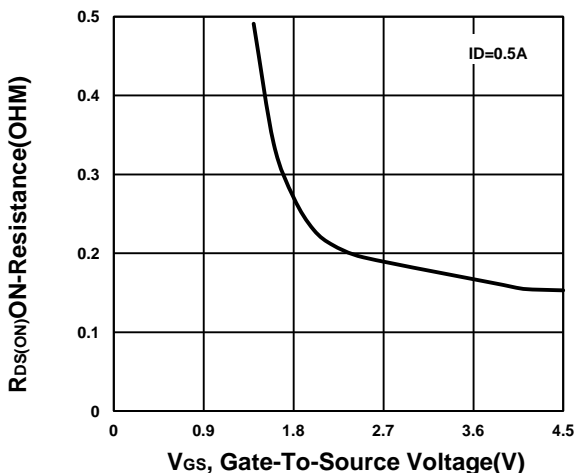
Output Characteristics



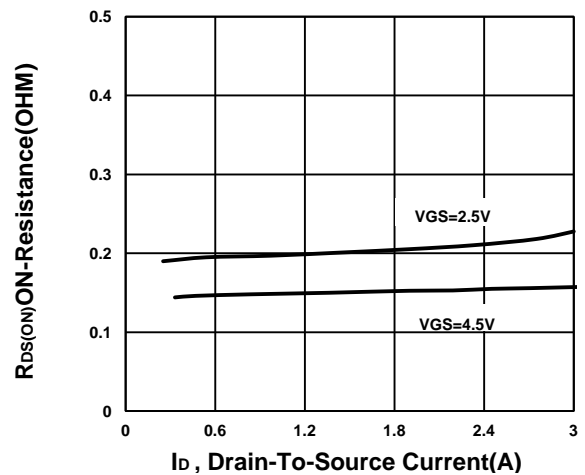
Transfer Characteristics



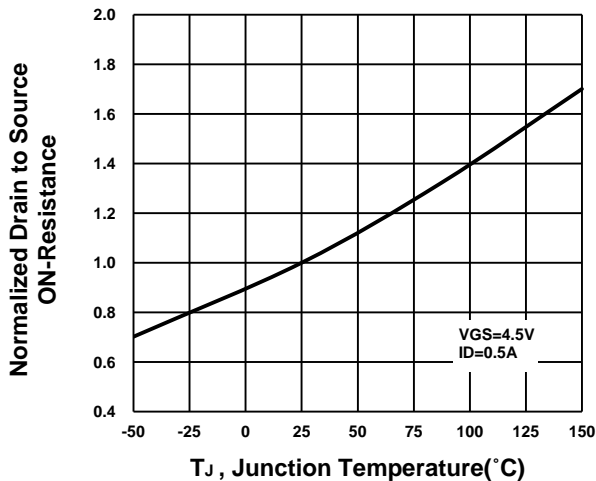
On-Resistance VS Gate-To-Source



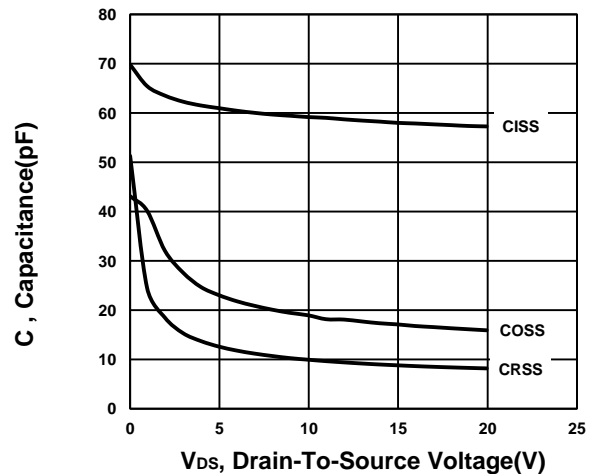
On-Resistance VS Drain Current



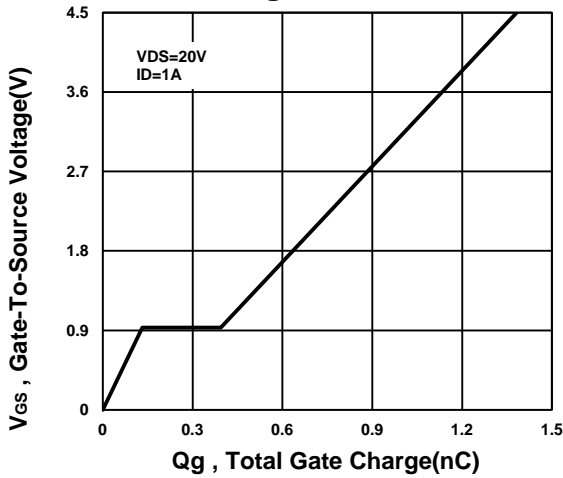
On-Resistance VS Temperature



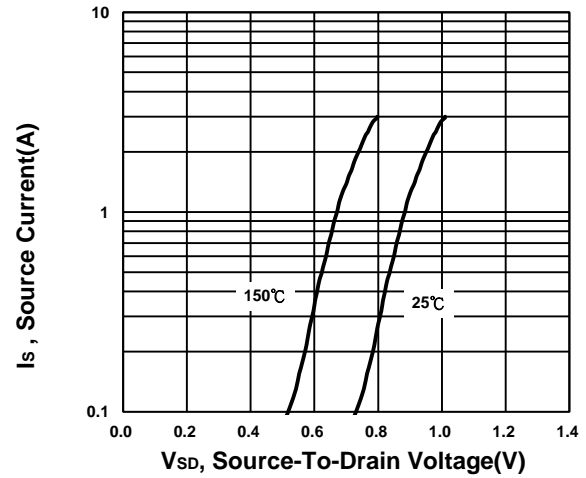
Capacitance Characteristic



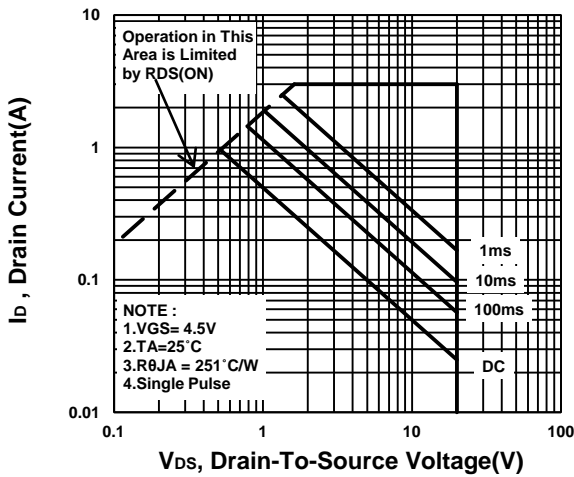
Gate charge Characteristics



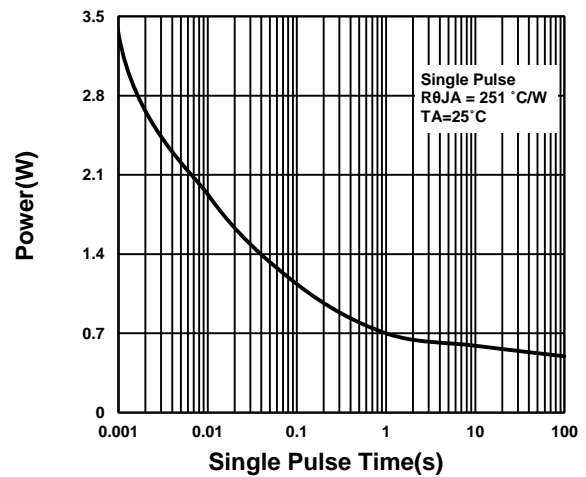
Source-Drain Diode Forward Voltage



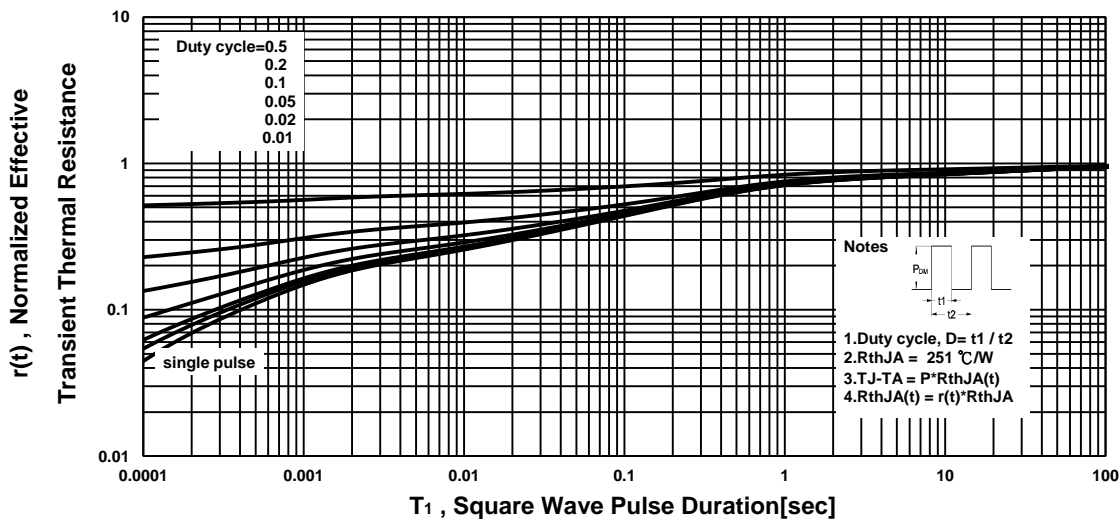
Safe Operating Area



Single Pulse Maximum Power Dissipation

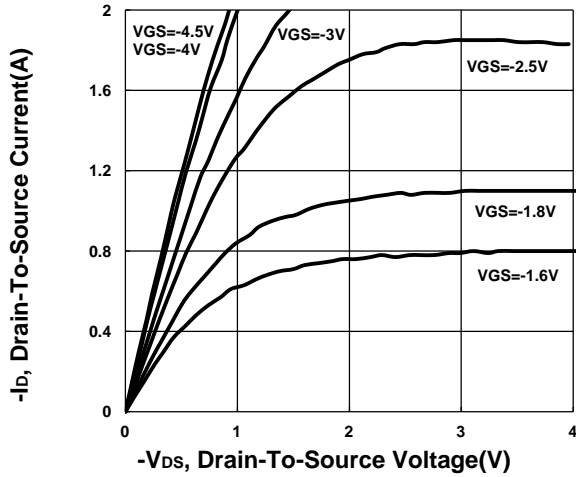


Transient Thermal Response Curve

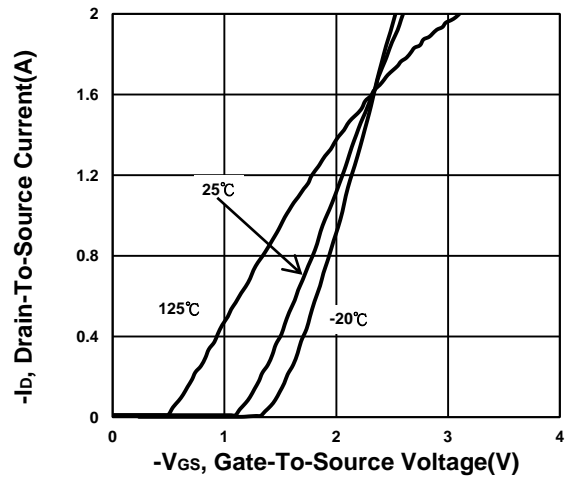


P-CHANNEL

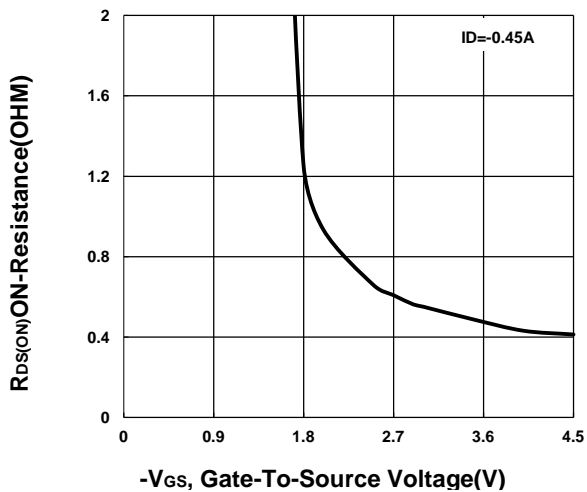
Output Characteristics



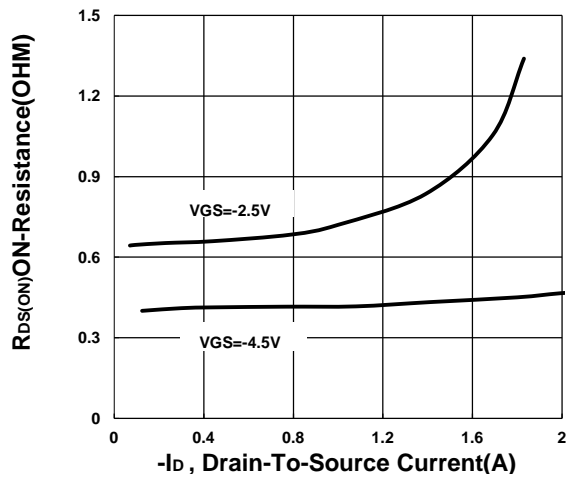
Transfer Characteristics



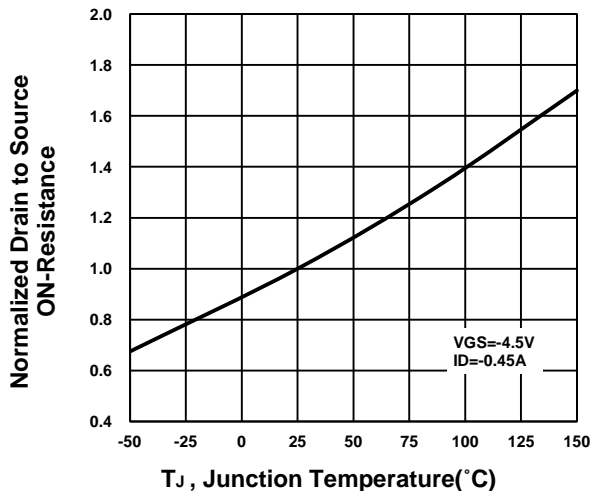
On-Resistance VS Gate-To-Source



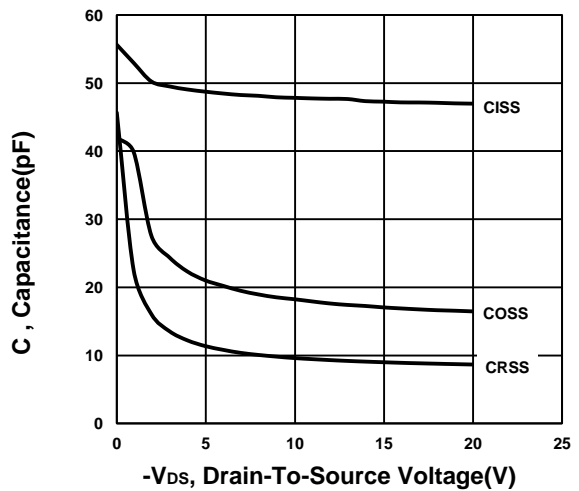
On-Resistance VS Drain Current



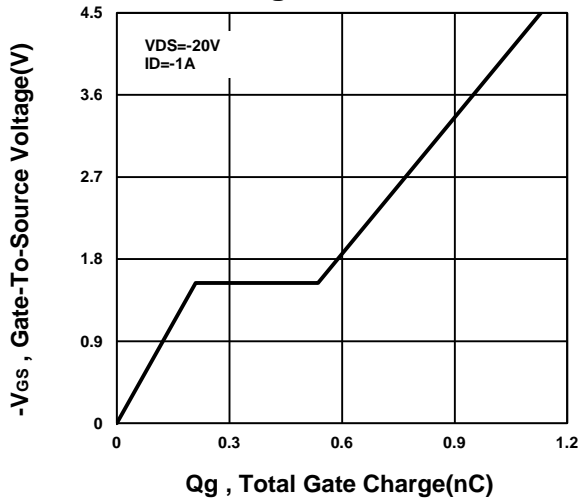
On-Resistance VS Temperature



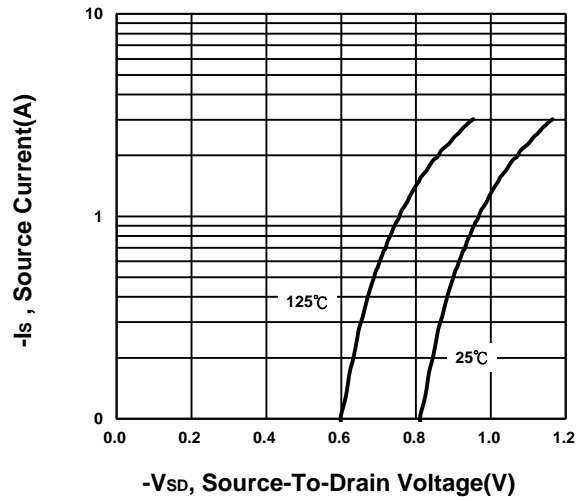
Capacitance Characteristic



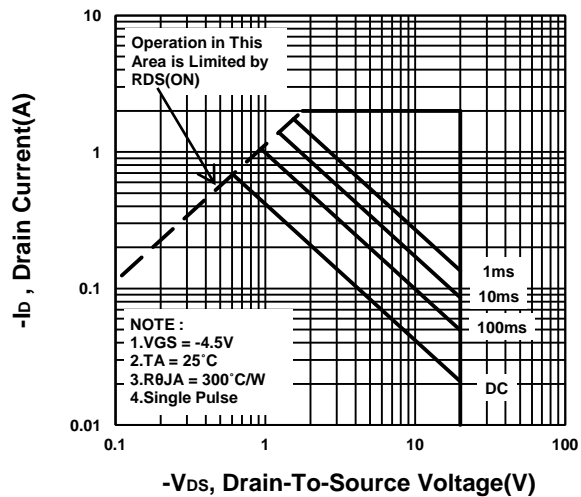
Gate charge Characteristics



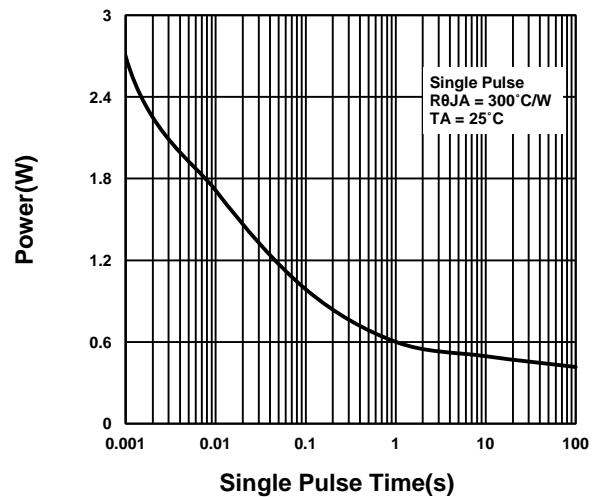
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

