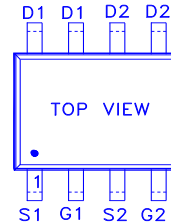
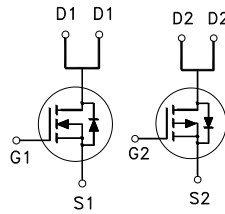


PRODUCT SUMMARY

	V _{(BR)DSS}	R _{DS(ON)}	I _D
Q2	-60V	95mΩ	-3.3A
Q1	60V	55mΩ	4A



G. GATE
D. DRAIN
S. SOURCE

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	Q2	Q1	UNITS
Drain-Source Voltage		V _{DS}	-60	60	V
Gate-Source Voltage		V _{GS}	±25	±20	V
Continuous Drain Current	T _A = 25 °C	I _D	-3.3	4	A
	T _A = 100 °C		-2.7	3.2	
Pulsed Drain Current ¹		I _{DM}	-20	20	
Avalanche Current		I _{AS}	-17	14	
Avalanche Energy	L = 0.1mH	E _{AS}	14	9.8	mJ
Power Dissipation	T _A = 25 °C	P _D	2	2.1	W
	T _A = 100 °C		1.3	1.3	
Operating Junction & Storage Temperature Range		T _j , T _{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE		SYMBOL		TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	t ≤ 10s	R _{θJA}	Q2		61	°C / W
			Q1		60	
Junction-to-Ambient	Steady-State	R _{θJA}	Q2		102	
			Q1		101	

¹Pulse width limited by maximum junction temperature.

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	Q2	-60		V	
		V _{GS} = 0V, I _D = 250μA	Q1	60			
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	Q2	-1.3	-1.8	-2.3	V
		V _{DS} = V _{GS} , I _D = 250μA	Q1	1.3	1.8	2.3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±25V	Q2			±100	nA
		V _{DS} = 0V, V _{GS} = ±20V	Q1			±100	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -48V, V _{GS} = 0V	Q2			-1	μA
		V _{DS} = 48V, V _{GS} = 0V	Q1			1	
		V _{DS} = -40V, V _{GS} = 0V, T _J = 55 °C	Q2			-10	
		V _{DS} = 40V, V _{GS} = 0V, T _J = 55 °C	Q1			10	
Drain-Source On-State Resistance ¹	R _{DS(ON)}	V _{GS} = -4.5V, I _D = -3.4A	Q2		115	135	mΩ
		V _{GS} = 4.5V, I _D = 4A	Q1		54	72	
		V _{GS} = -10V, I _D = -3.4A	Q2		82	95	
		V _{GS} = 10V, I _D = 4A	Q1		46	55	
Forward Transconductance ¹	g _{fs}	V _{DS} = -5V, I _D = -3.4A	Q2		10		S
		V _{DS} = 5V, I _D = 4A	Q1		21		
DYNAMIC							
Input Capacitance	C _{iss}	Q2 V _{GS} = 0V, V _{DS} = -25V, f = 1MHz	Q2		545		pF
			Q1		389		
Output Capacitance	C _{oss}	Q1 V _{GS} = 0V, V _{DS} = 25V, f = 1MHz	Q2		76		pF
			Q1		55		
Reverse Transfer Capacitance	C _{rss}	Q2	Q2		49		pF
			Q1		38		
Gate Resistance	R _g	Q2 V _{GS} = 0V, V _{DS} = 0V, f = 1MHz	Q2		8.9		Ω
			Q1		1.7		
Total Gate Charge ²	Q _g	Q2 V _{DS} = -30V, V _{GS} = -10V, I _D = -3.4A	Q2		12		nC
			Q1		11		
			Q2		6.7		
			Q1		6.1		
Gate-Source Charge ²	Q _{gs}	Q1 V _{DS} = 30V, V _{GS} = 10V, I _D = 4A	Q2		1.6		nC
			Q1		1.3		
Gate-Drain Charge ²	Q _{gd}	Q2	Q2		3.9		nC
			Q1		3.9		

Turn-On Delay Time ²	$t_{d(on)}$	Q2 , $V_{DS} = -30V$, $I_D \cong -3.4A$, $V_{GS} = -10V$, $R_{GEN} = 6\Omega$	Q2		12		nS
			Q1		11		
Rise Time ²	t_r	Q1 , $V_{DS} = 30V$, $I_D \cong 4A$, $V_{GS} = 10V$, $R_{GEN} = 6\Omega$	Q2		33		
			Q1		49		
Turn-Off Delay Time ²	$t_{d(off)}$		Q2		50		
			Q1		22		
Fall Time ²	t_f		Q2		53		
			Q1		83		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$)							
Continuous Current ³	I_S		Q2			-2	A
			Q1			1.8	
Forward Voltage ¹	V_{SD}	$I_F = -3.4A$, $V_{GS} = 0V$	Q2			-1	V
		$I_F = 4A$, $V_{GS} = 0V$	Q1			1.2	
Reverse Recovery Time	t_{rr}	Q2	Q2		17		nS
		$I_F = -3.4A$, $di_F/dt = 100A / \mu S$	Q1		17		
Reverse Recovery Charge	Q_{rr}	Q1	Q2		15		nC
		$I_F = 4A$, $di_F/dt = 100A / \mu S$	Q1		11		

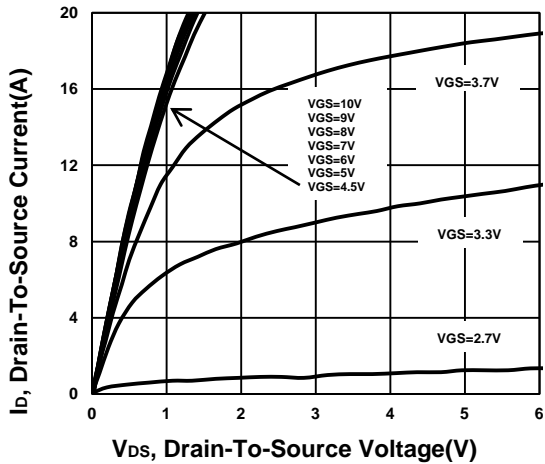
¹Pulse test : Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

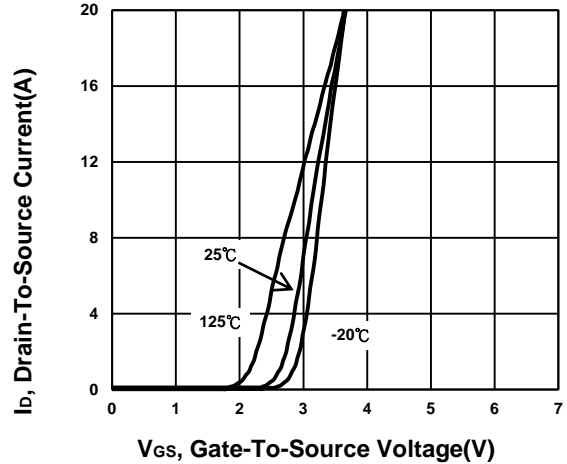
Typical performance characteristics

N-channel

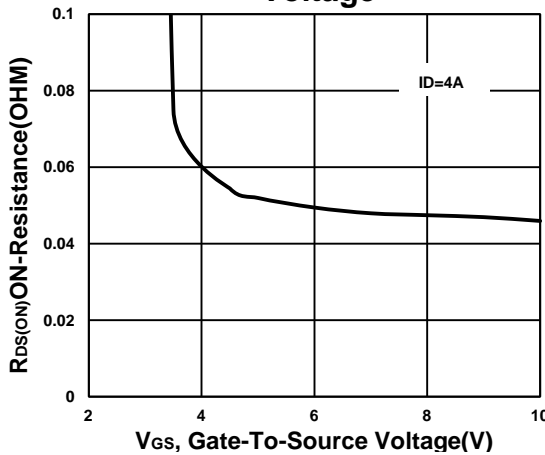
Output Characteristics



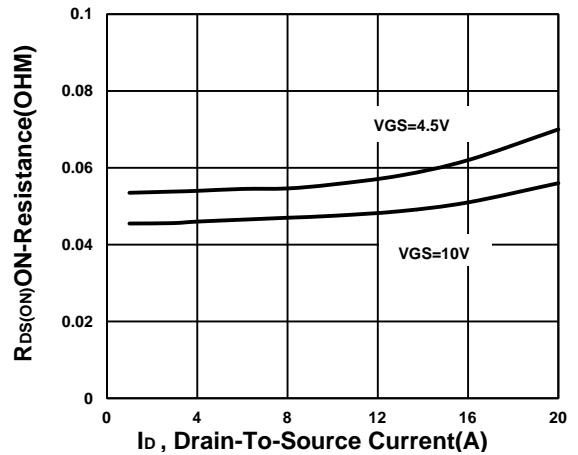
Transfer Characteristics



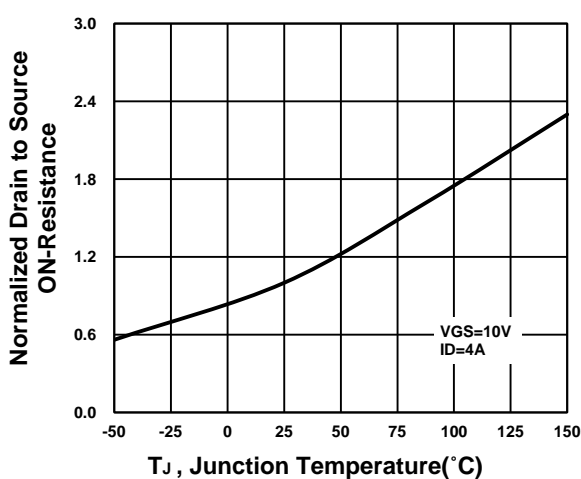
On-Resistance VS Gate-To-Source Voltage



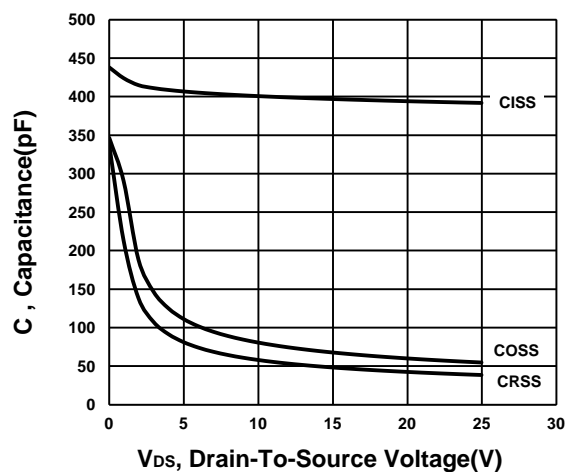
On-Resistance VS Drain Current



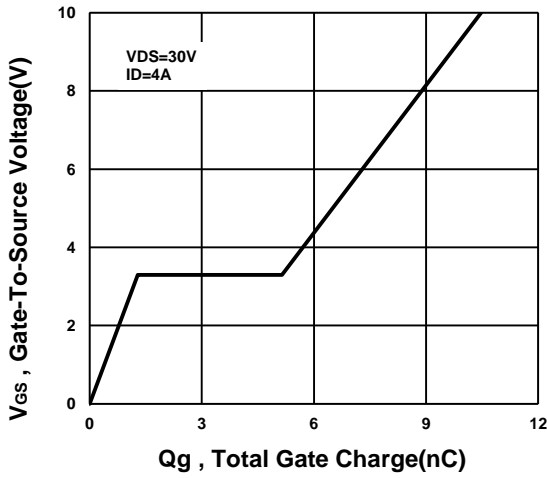
On-Resistance VS Temperature



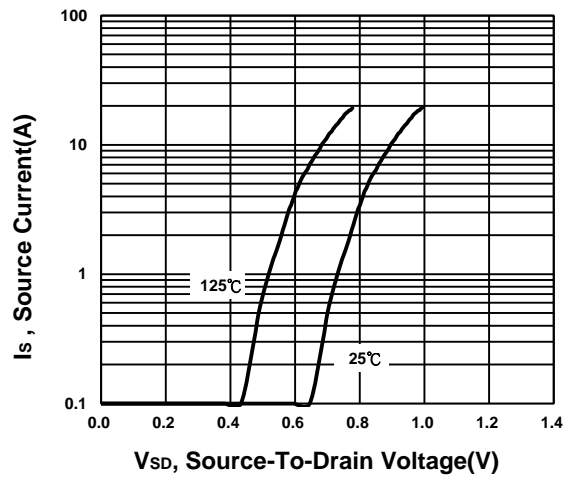
Capacitance Characteristic



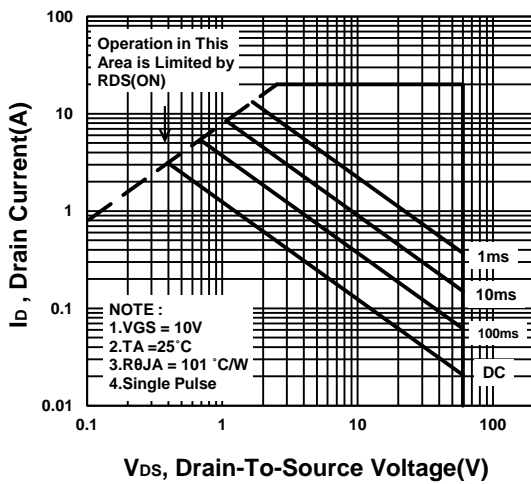
Gate charge Characteristics



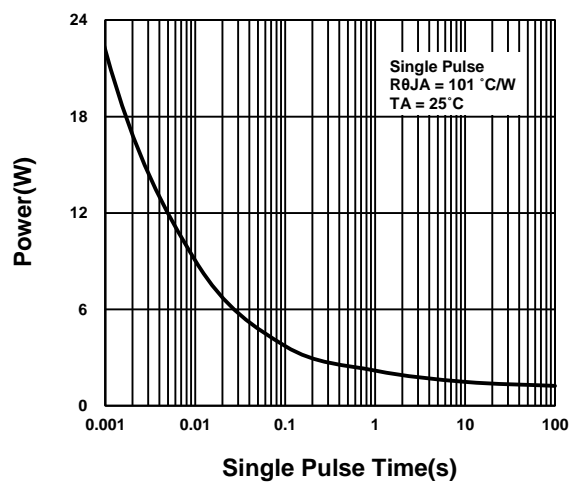
Source-Drain Diode Forward Voltage



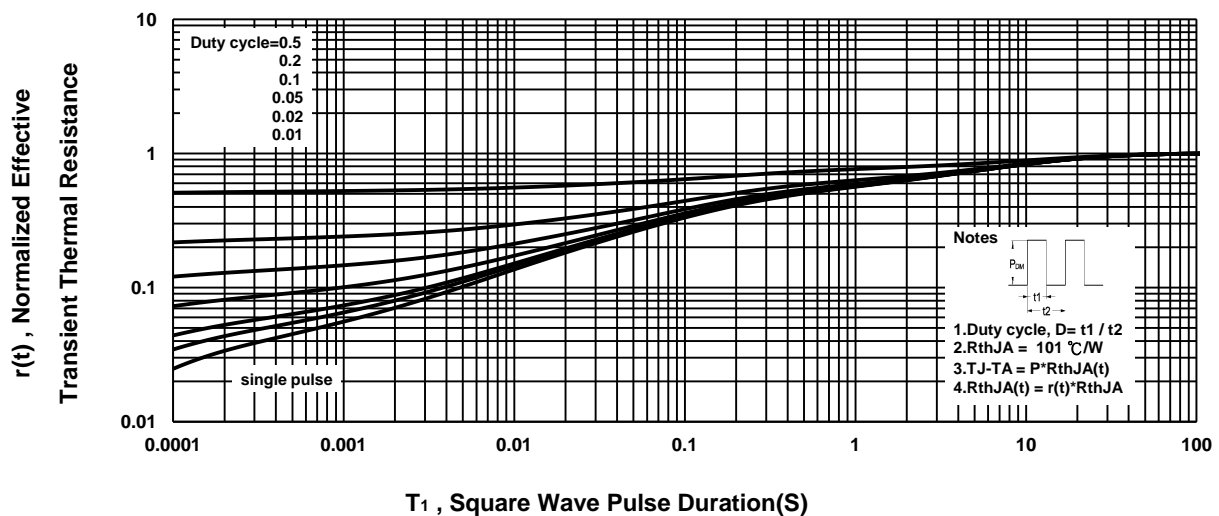
Safe Operating Area



Single Pulse Maximum Power Dissipation



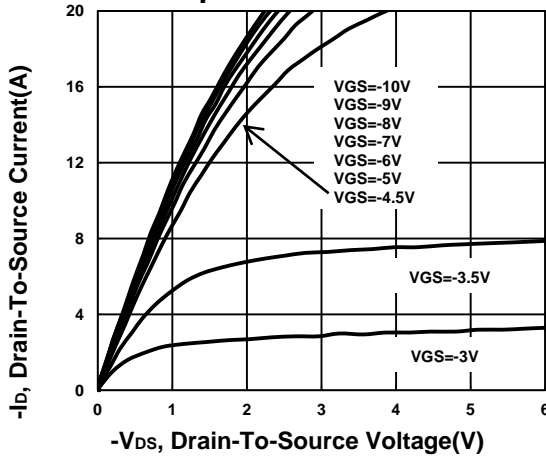
Transient Thermal Response Curve



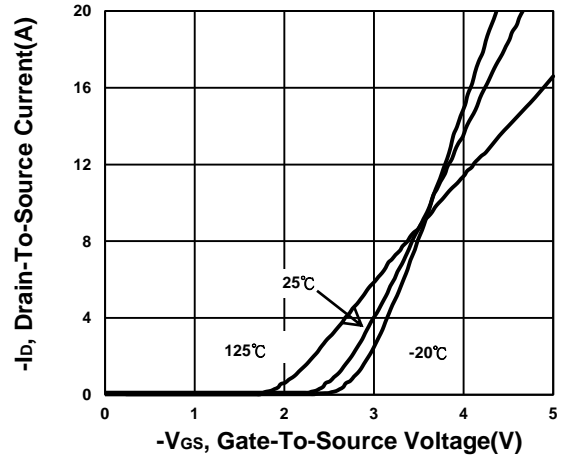
Typical performance characteristics

P-channel

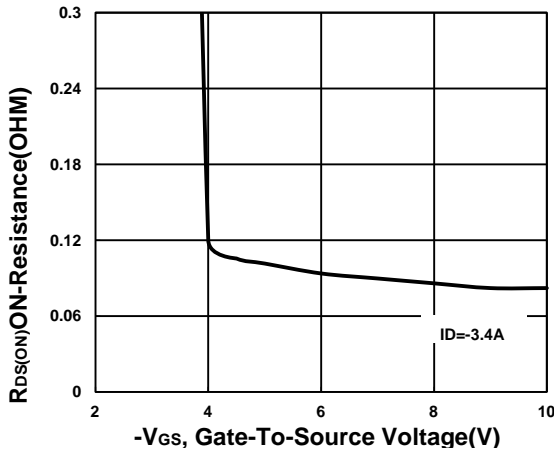
Output Characteristics



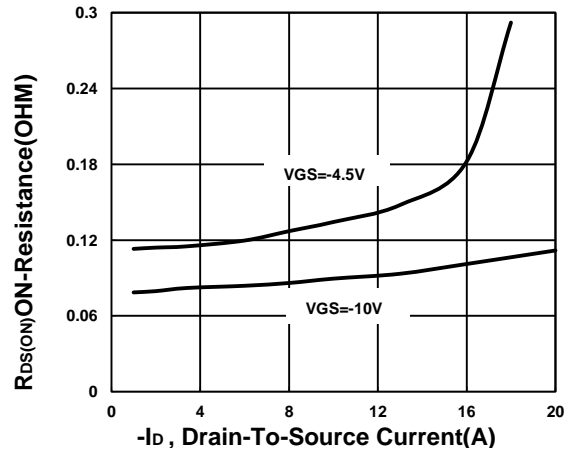
Transfer Characteristics



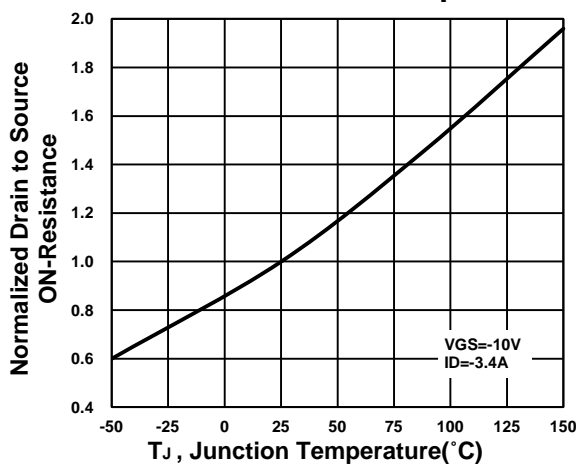
On-Resistance VS Gate-To-Source Voltage



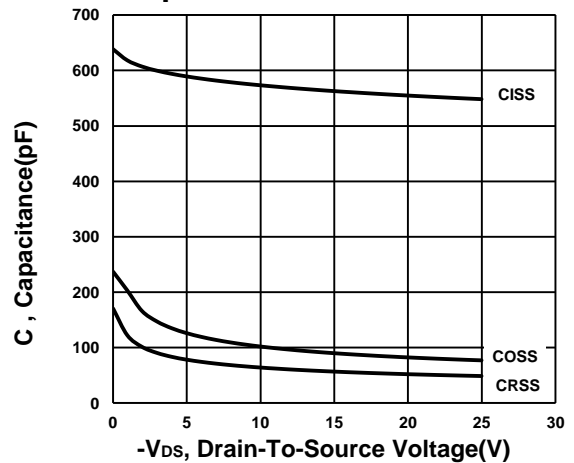
On-Resistance VS Drain Current



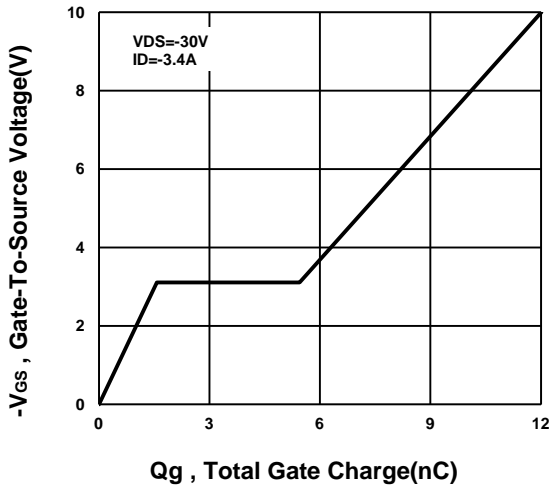
On-Resistance VS Temperature



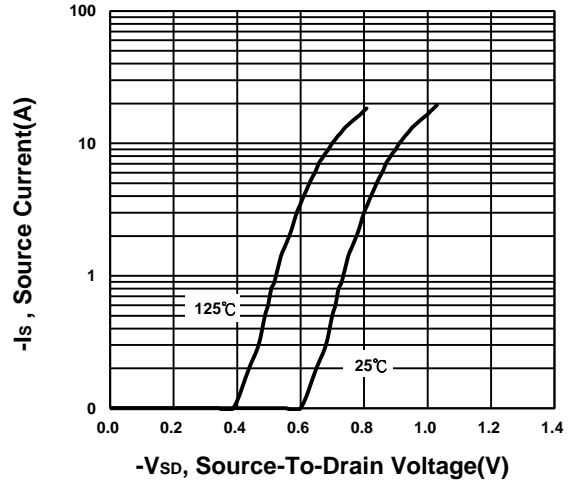
Capacitance Characteristic



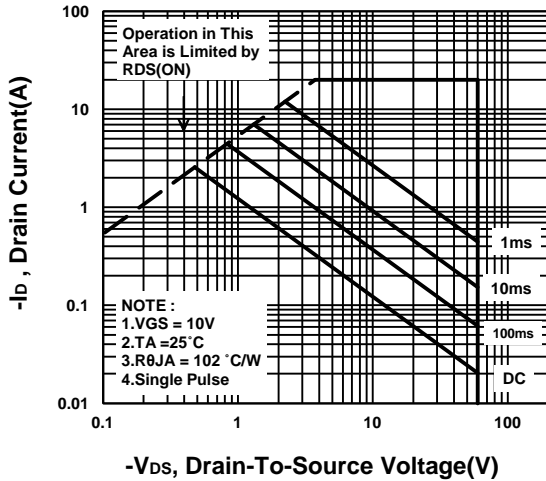
Gate charge Characteristics



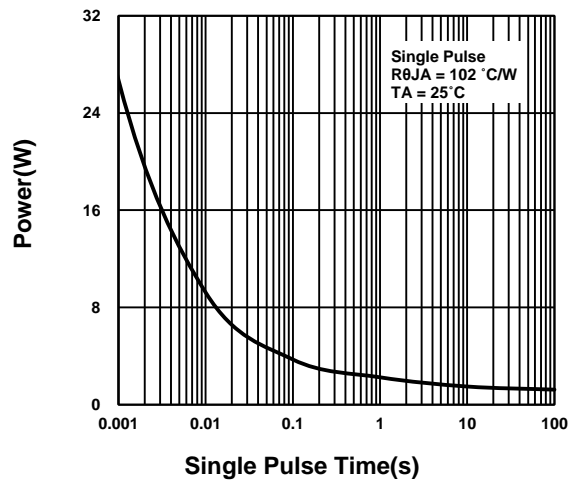
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

