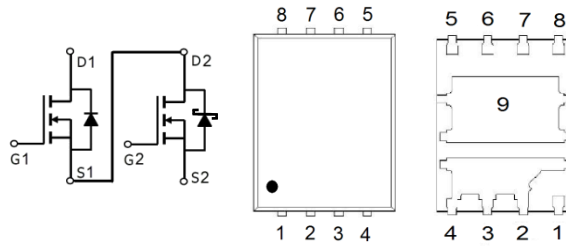


**PRODUCT SUMMARY**

	$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
Q2	30V	4.9mΩ	64A
Q1	30V	7.8mΩ	40A



1 : G1  
2,3,4 : D1  
5,6,7 : S2  
8 : G2  
9 : S1/D2

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

PARAMETERS/TEST CONDITIONS		SYMBOL	Q2	Q1	UNITS
Drain-Source Voltage		$V_{DS}$	30	30	V
Gate-Source Voltage		$V_{GS}$	±20	±20	V
Continuous Drain Current <sup>3</sup>	$T_C = 25\text{ °C}$	$I_D$	64	40	A
	$T_C = 100\text{ °C}$		40	25	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	150	90	
Continuous Drain Current	$T_A = 25\text{ °C}$	$I_D$	21	14	
	$T_A = 70\text{ °C}$		17	11	
Avalanche Current		$I_{AS}$	35	21	
Avalanche Energy	$L = 0.1\text{mH}$	$E_{AS}$	61	22	mJ
Power Dissipation	$T_C = 25\text{ °C}$	$P_D$	37	24	W
	$T_C = 100\text{ °C}$		15	9.6	
Power Dissipation <sup>4</sup>	$T_A = 25\text{ °C}$	$P_D$	4	3.1	W
	$T_A = 70\text{ °C}$		2.6	2	
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 <sup>2</sup>	$t \leq 10\text{s}$	$R_{\theta JA}$	Q2	30	°C / W
			Q1	40	
	Steady-State	$R_{\theta JA}$	Q2	56	
			Q1	72	
Junction-to-Case		$R_{\theta JC}$	Q2	3.3	
			Q1	5.2	

<sup>1</sup>Pulse width limited by maximum junction temperature  $T_{J(MAX)}=150\text{°C}$ .

<sup>2</sup>The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25\text{°C}$ . The value in any given application depends on the user's specific board design.

<sup>3</sup>Package limitation current :Q1=25A,Q2=25A

<sup>4</sup>The Power dissipation is based on  $R_{\theta JA} t \leq 10\text{s}$  value.

**ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)**

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA	Q2	30		V
		V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	Q1	30		
Drain-Source Breakdown Voltage (transient)	V <sub>(BR)DSSt</sub>	V <sub>GS</sub> = 0V, I <sub>D(aval)</sub> = 12.6A T <sub>case</sub> = 25 °C, t <sub>transient</sub> = 100ns	Q2	34		
			Q1	34		
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	Q2	1.3	1.6	2.3
			Q1	1.27	1.36	2.3
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	Q2			±100
			Q1			±100
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V	Q2			0.5
			Q1			1
		V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55 °C	Q2			5
			Q1			10
Drain-Source On-State Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 16A	Q2		3.4	5.1
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 11A	Q1		6.8	11
		V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A	Q2		2.7	4.9
		V <sub>GS</sub> = 10V, I <sub>D</sub> = 11A	Q1		5.3	7.8
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 20A	Q2		70	S
		V <sub>DS</sub> = 5V, I <sub>D</sub> = 11A	Q1		66	

<b>DYNAMIC</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz	Q2		2148	pF
			Q1		853	
Output Capacitance	C <sub>oss</sub>		Q2		402	
			Q1		149	
Reverse Transfer Capacitance	C <sub>rss</sub>		Q2		255	
			Q1		109	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz	Q2		1.6	Ω
		Q1		0.8		

Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	V <sub>GS</sub> = 10V	Q2 V <sub>DS</sub> = 15V , V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A Q1 V <sub>DS</sub> = 15V , V <sub>GS</sub> = 10V, I <sub>D</sub> = 11A	Q2	44	nC	
		V <sub>GS</sub> = 4.5V		Q1	18		
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>			Q2	23.3		
				Q1	10		
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>			Q2	5.4		
				Q1	2.1		
Turn-On Delay Time <sup>2</sup>	t <sub>d(on)</sub>			Q2	11		
				Q1	4.8		
Rise Time <sup>2</sup>	t <sub>r</sub>	Q2 V <sub>DS</sub> = 15V , I <sub>D</sub> ≅ 20A, V <sub>GS</sub> = 10V, R <sub>GEN</sub> =6Ω		Q2	30		nS
				Q1	25		
Turn-Off Delay Time <sup>2</sup>	t <sub>d(off)</sub>	Q1 V <sub>DS</sub> = 15V , I <sub>D</sub> ≅ 11A, V <sub>GS</sub> = 10V, R <sub>GEN</sub> =6Ω	Q2	20			
			Q1	21			
Fall Time <sup>2</sup>	t <sub>f</sub>		Q2	61			
			Q1	40			
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b>							
Continuous Current <sup>3</sup>	I <sub>S</sub>		Q2	37	A		
			Q1	20			
Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> =20A, V <sub>GS</sub> = 0V	Q2	1	V		
		I <sub>F</sub> = 11A, V <sub>GS</sub> = 0V	Q1	1.2			
Reverse Recovery Time	t <sub>rr</sub>	Q2 I <sub>F</sub> = 20A, dI <sub>F</sub> /dt = 100A / μS	Q2	21	nS		
			Q1	13.5			
Reverse Recovery Charge	Q <sub>rr</sub>	Q1 I <sub>F</sub> = 11A, dI <sub>F</sub> /dt = 100A / μS	Q2	6.5	nC		
			Q1	4			

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

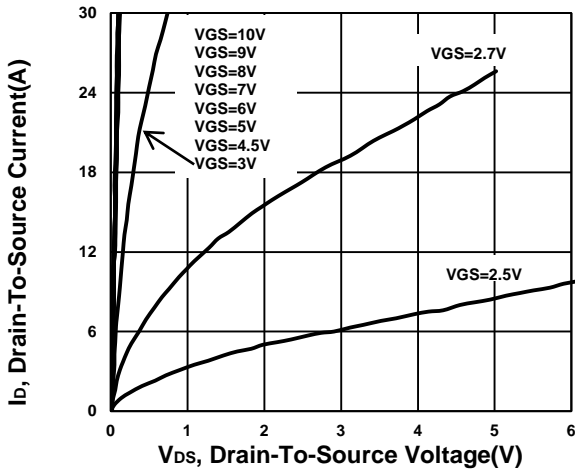
<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Package limitation current :Q1=25A,Q2=25A

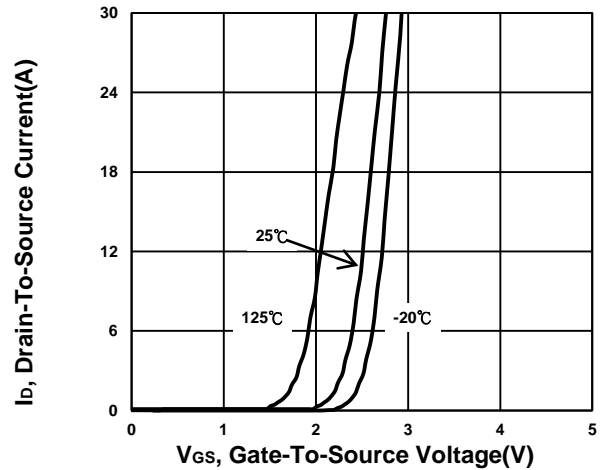
**TYPICAL PERFORMANCE CHARACTERISTICS**

**Q2**

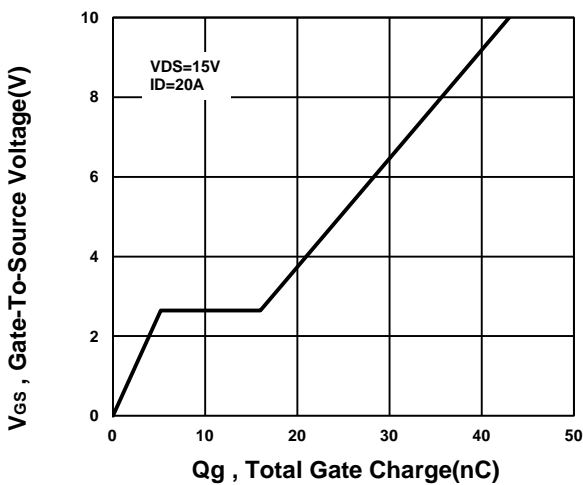
**Output Characteristics**



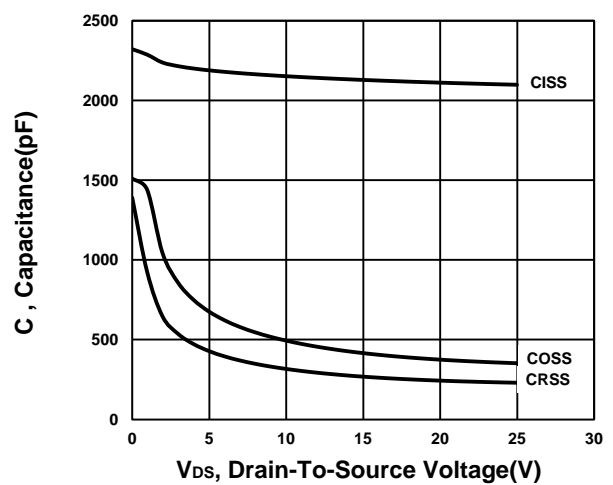
**Transfer Characteristics**



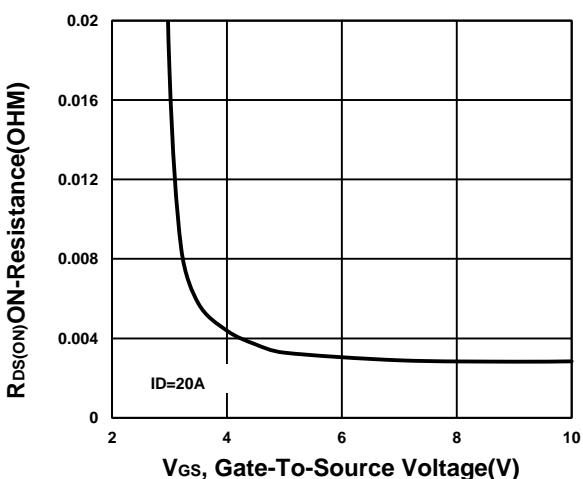
**Gate charge Characteristics**



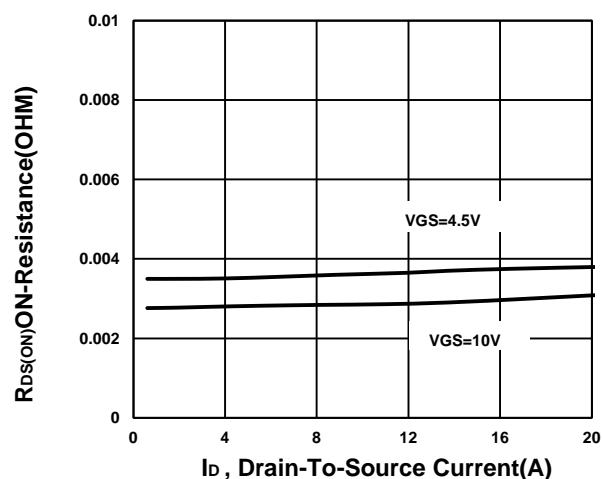
**Capacitance Characteristic**



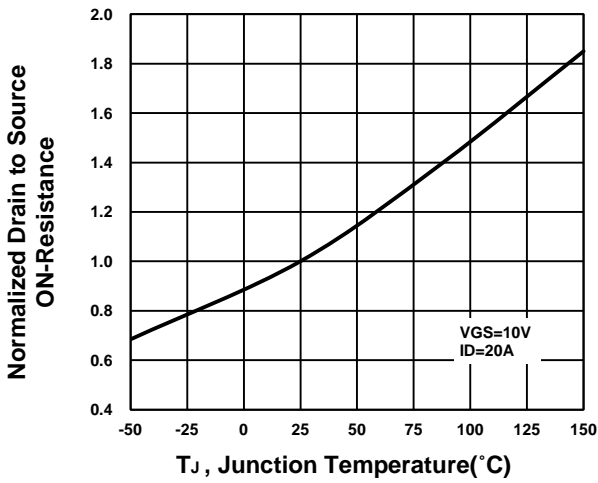
**On-Resistance VS Gate-To-Source**



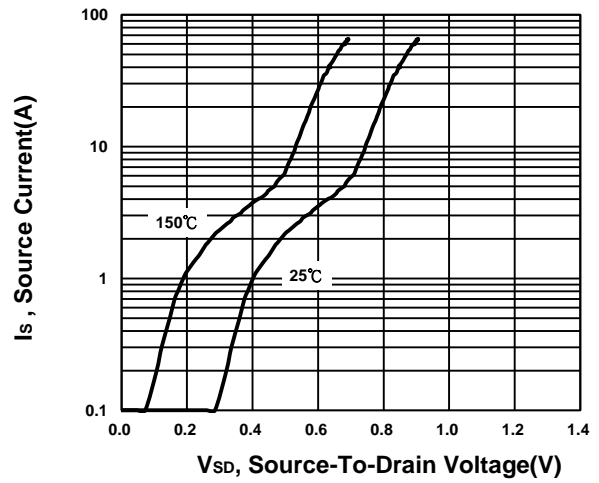
**On-Resistance VS Drain Current**



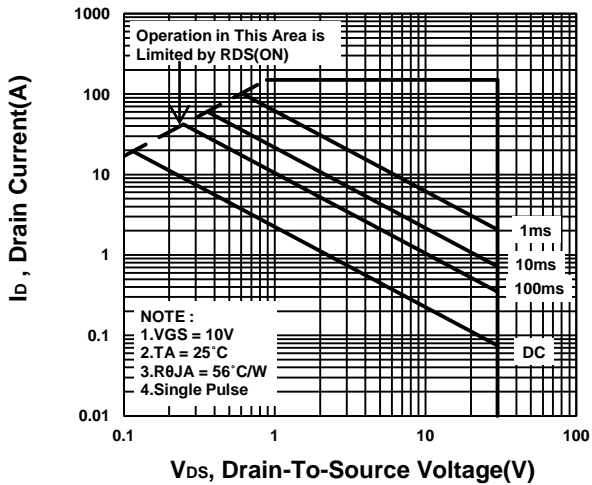
**On-Resistance VS Temperature**



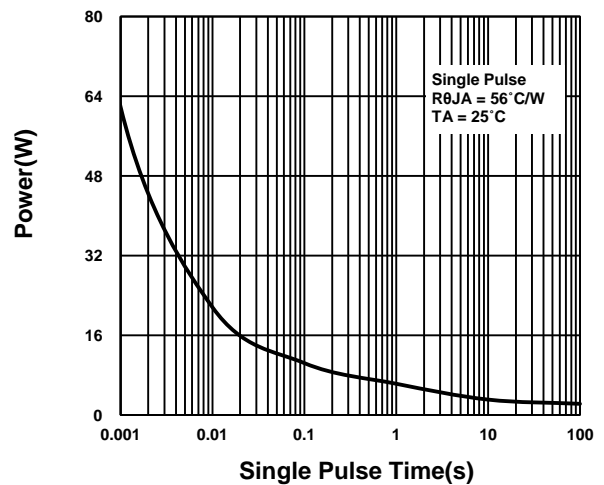
**Source-Drain Diode Forward Voltage**



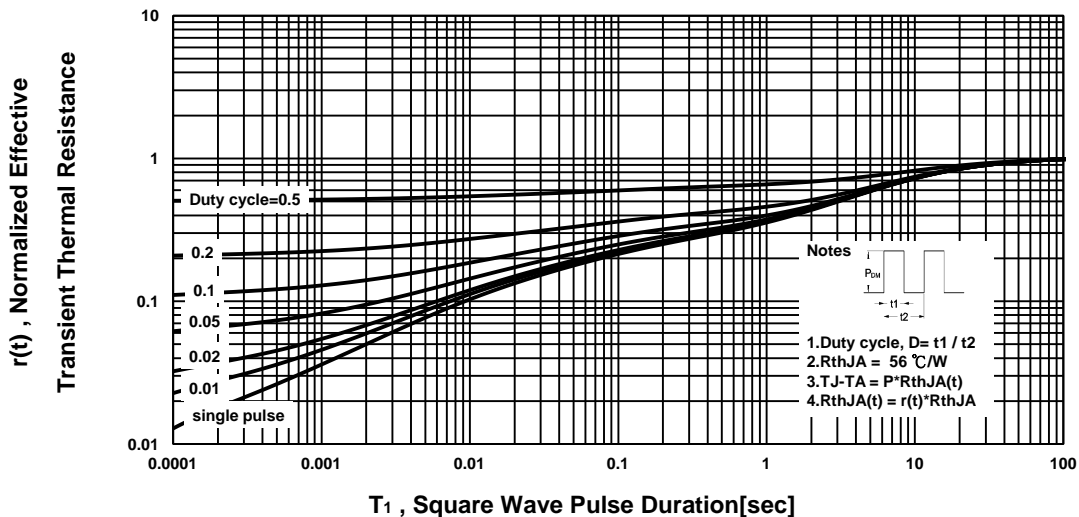
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**

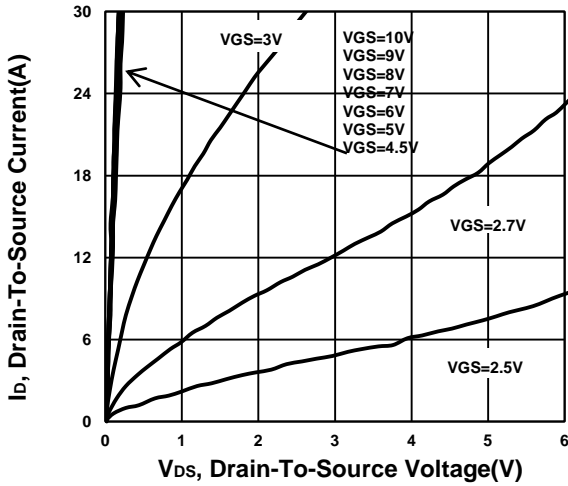


**Transient Thermal Response Curve**

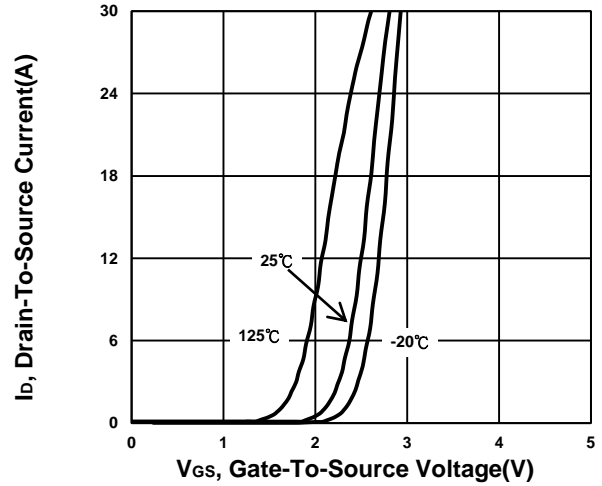


**Q1**

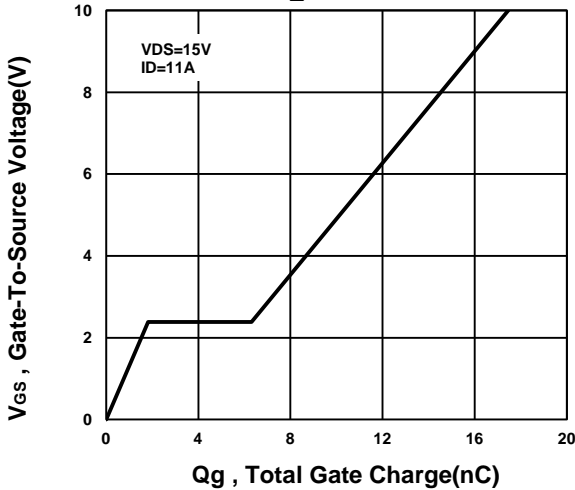
**Output Characteristics**



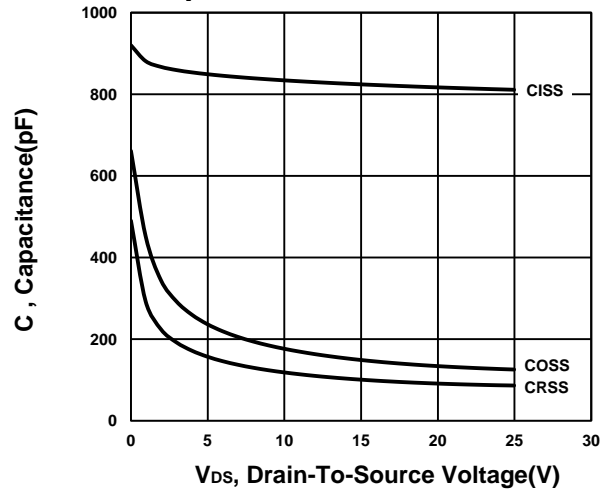
**Transfer Characteristics**



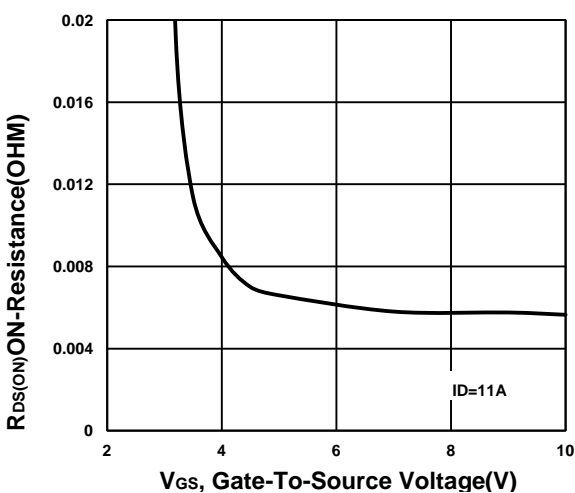
**Gate charge Characteristics**



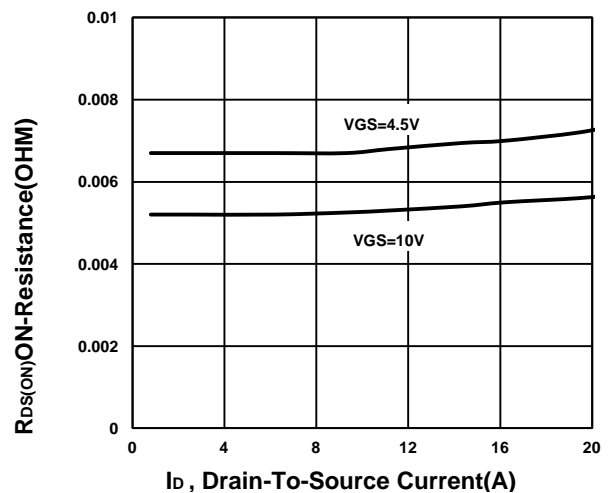
**Capacitance Characteristic**



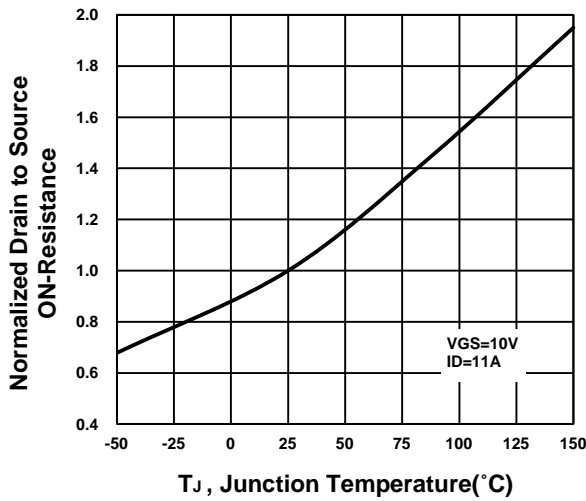
**On-Resistance VS Gate-To-Source**



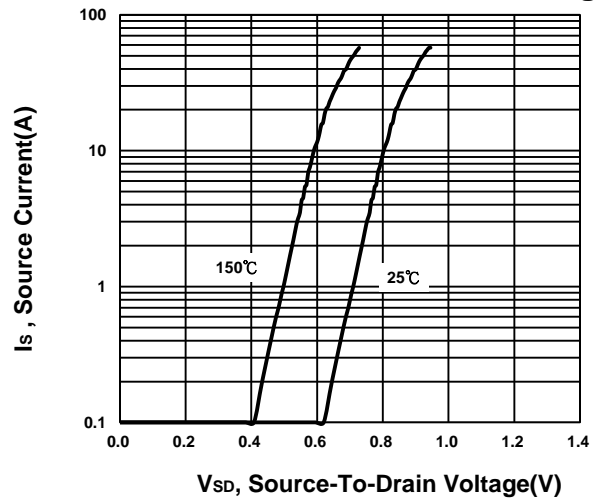
**On-Resistance VS Drain Current**



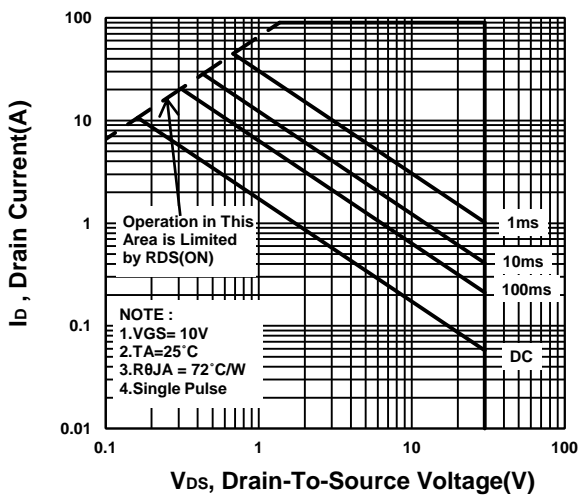
**On-Resistance VS Temperature**



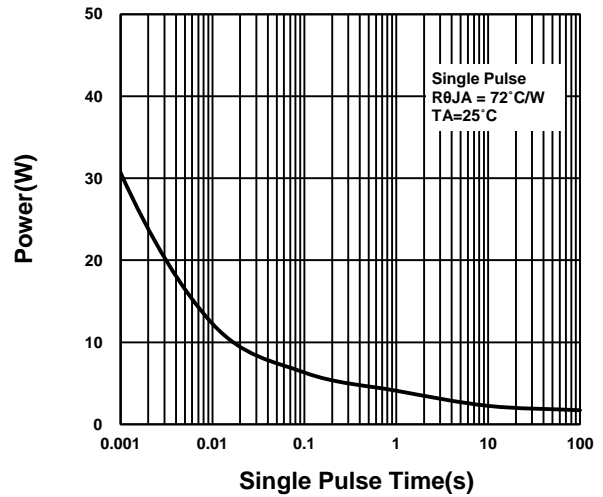
**Source-Drain Diode Forward Voltage**



**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**

