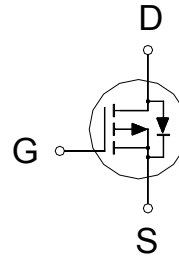


**PRODUCT SUMMARY**

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
-20V	10mΩ	-49A

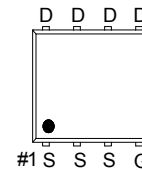


**Features**

- 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.

**Applications**

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



G. GATE  
D. DRAIN  
S. SOURCE

100% UIS Tested  
100% Rg Tested

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	-20	V
Gate-Source Voltage		$V_{GS}$	±12	V
Continuous Drain Current <sup>4</sup>	$T_C = 25\text{ °C}$	$I_D$	-49	A
	$T_C = 100\text{ °C}$		-31	
	$T_A = 25\text{ °C}$		-14.4	
	$T_A = 70\text{ °C}$		-11.5	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	-75	
Avalanche Current		$I_{AS}$	-39	
Avalanche Energy	L = 0.1mH	$E_{AS}$	76	mJ
Power Dissipation <sup>3</sup>	$T_C = 25\text{ °C}$	$P_D$	41	W
	$T_C = 100\text{ °C}$		16	
	$T_A = 25\text{ °C}$		3.5	
	$T_A = 70\text{ °C}$		2.2	
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>	$t \leq 10s$	$R_{\theta JA}$		35	°C / W
Junction-to-Ambient <sup>2</sup>	Steady-State	$R_{\theta JA}$		55	
Junction-to-Case	Steady-State	$R_{\theta JC}$		3	

<sup>1</sup>Pulse width limited by maximum junction temperature.

<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  $T_A = 25^\circ C$ .

<sup>3</sup>The Power dissipation is based on  $R_{\theta JA} t \leq 10s$  value.

<sup>4</sup>Package limitation current is -33A.

**ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ C$ , Unless Otherwise Noted)**

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.6	-0.8	-1.2	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 12V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -16V, V_{GS} = 0V$			-1	$\mu A$
		$V_{DS} = -10V, V_{GS} = 0V, T_J = 55^\circ C$			-10	
Drain-Source On-State Resistance <sup>1</sup>	$R_{DS(ON)}$	$V_{GS} = -4.5V, I_D = -12A$		6.6	10	$m\Omega$
		$V_{GS} = -2.5V, I_D = -12A$		9.4	13	
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = -5V, I_D = -12A$		60		S
<b>DYNAMIC</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = -10V, f = 1MHz$		3107		$pF$
Output Capacitance	$C_{oss}$			422		
Reverse Transfer Capacitance	$C_{rss}$			360		
Gate Resistance	$R_g$	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$		3.2		$\Omega$
Total Gate Charge <sup>2</sup>	$Q_{g(VGS=-4.5V)}$	$V_{DS} = -10V, I_D = -12A$		36		nC
	$Q_{g(VGS=-2.5V)}$			22		
Gate-Source Charge <sup>2</sup>	$Q_{gs}$			4.3		
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$			11		

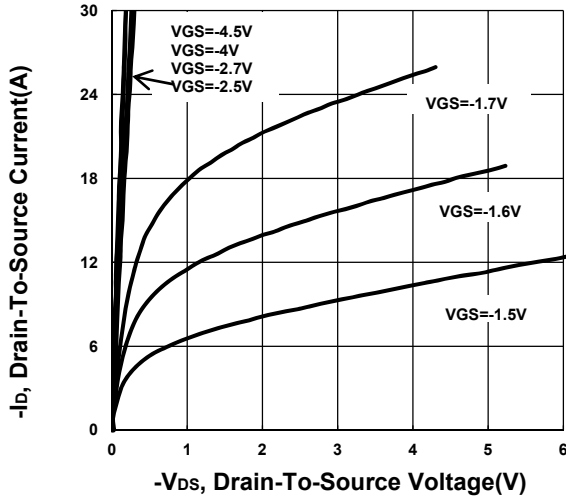
Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	$V_{DD} = -10V$ $I_D \cong -12A, V_{GS} = -4.5V, R_{GEN} = 6\Omega$	16	nS	
Rise Time <sup>2</sup>	$t_r$		145		
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$		122		
Fall Time <sup>2</sup>	$t_f$		163		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b>					
Continuous Current <sup>3</sup>	$I_S$		-34	A	
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = -12A, V_{GS} = 0V$	-1.2	V	
Reverse Recovery Time	$t_{rr}$	$I_F = -12A, di/dt = 100A/\mu s$	40	nS	
Reverse Recovery Charge	$Q_{rr}$		24	nC	

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

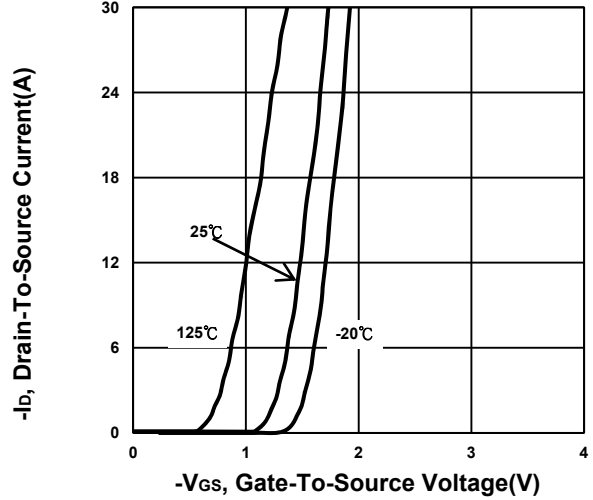
<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Package limitation current is -33A.

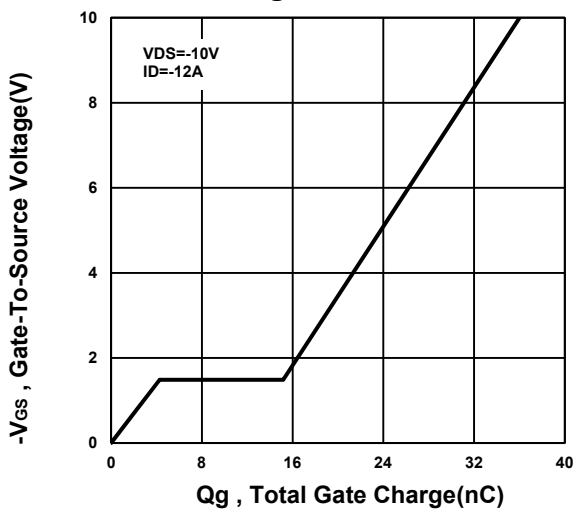
**Output Characteristics**



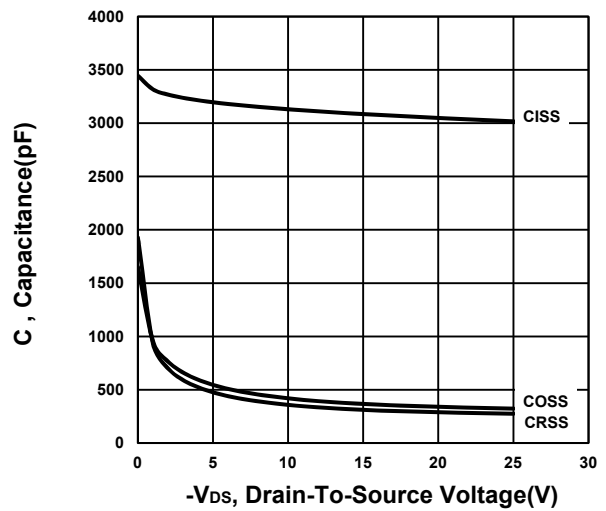
**Transfer Characteristics**



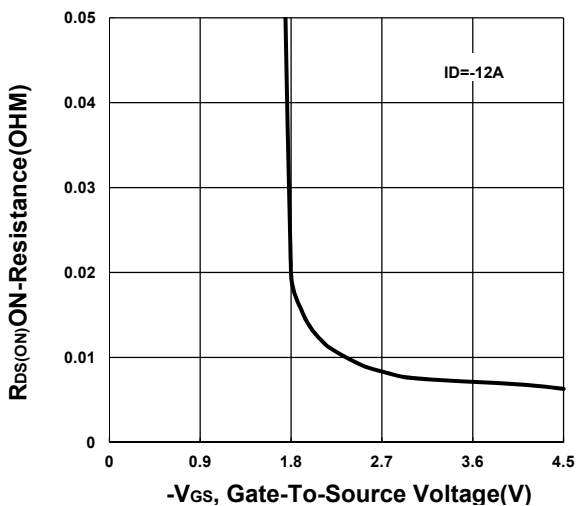
**Gate charge Characteristics**



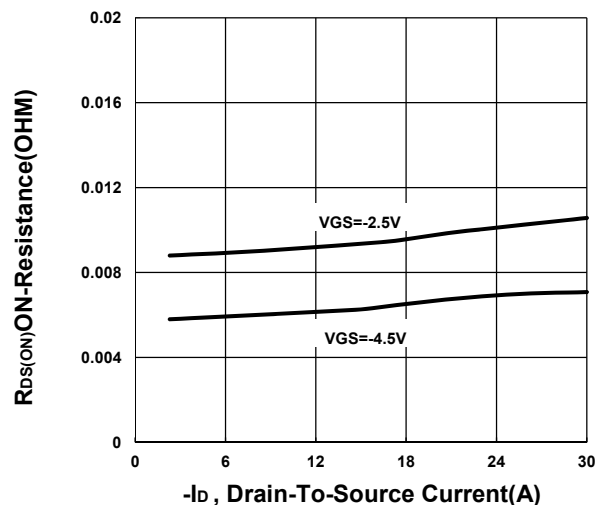
**Capacitance Characteristic**



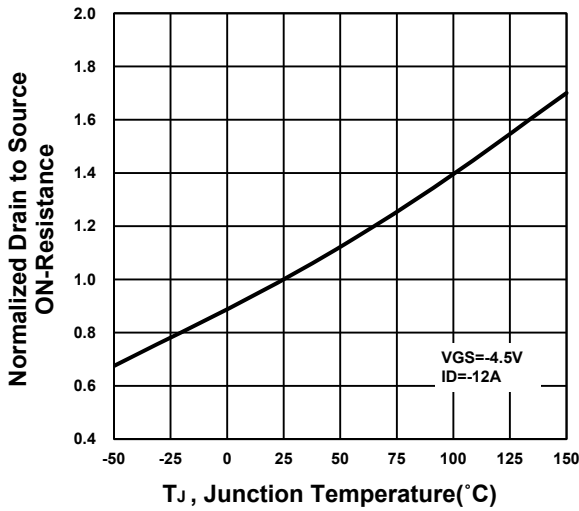
**On-Resistance VS Gate-To-Source**



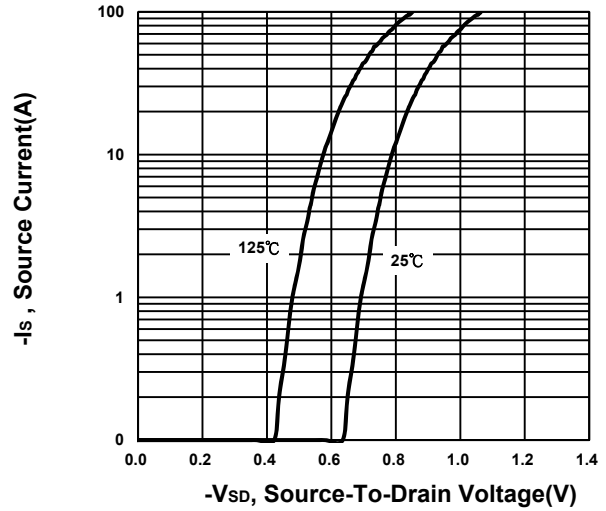
**On-Resistance VS Drain Current**



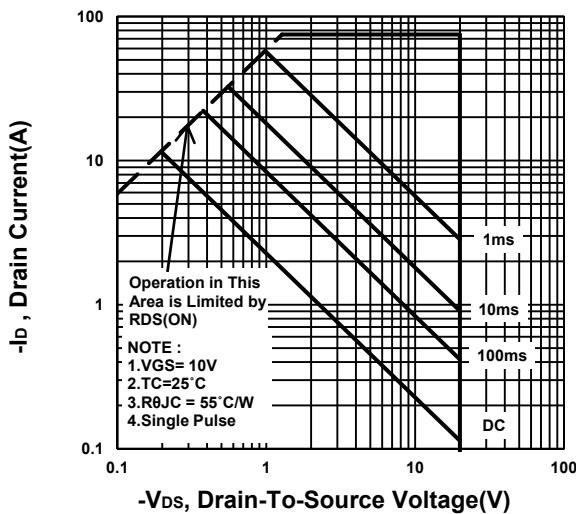
**On-Resistance VS Temperature**



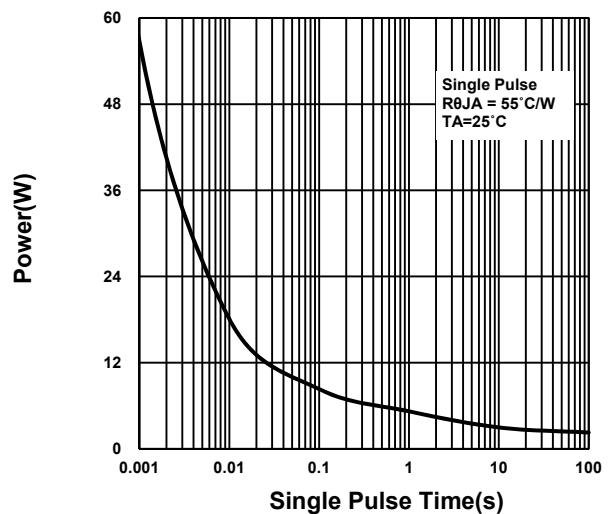
**Source-Drain Diode Forward Voltage**



**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**

