



**PRODUCT SUMMARY**

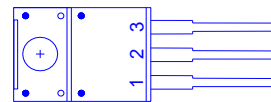
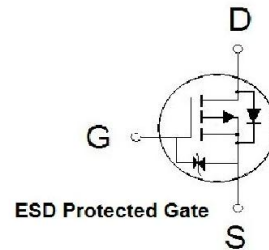
$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
-30V	8mΩ	-56A

**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.
- Products Integrated ESD diode with ESD Protected.

**Applications**

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



1. GATE
2. DRAIN
3. SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	-30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>2,3</sup>	$T_C = 25\text{ }^\circ\text{C}$	$I_D$	-56	A
	$T_C = 100\text{ }^\circ\text{C}$		-35	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	-168	
Avalanche Current		$I_{AS}$	-71	
Avalanche Energy	$L = 0.1\text{mH}$	$E_{AS}$	252	mJ
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	$P_D$	43	W
	$T_C = 100\text{ }^\circ\text{C}$		17	
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-Case	$R_{\theta JC}$		2.9	$^\circ\text{C} / \text{W}$
Junction-to-Ambient	$R_{\theta JA}$		62.5	

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

<sup>2</sup>Limited only by maximum temperature allowed.

<sup>3</sup>Package limitation current is -55A.

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

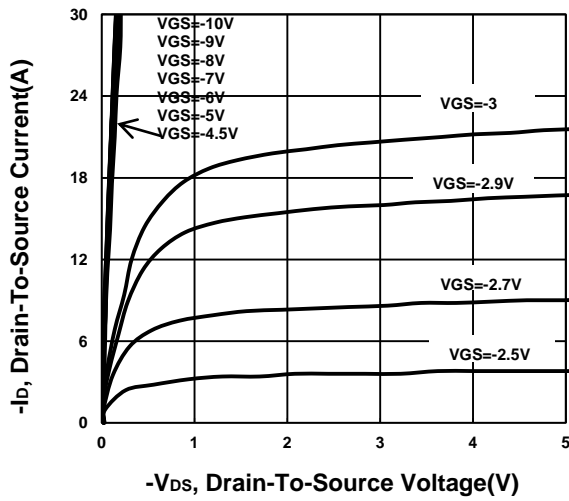
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.3	-1.65	-2.3	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±10	μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V			-1	μA
		V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125 °C			-10	
Drain-Source On-State Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -20A		8.6	13.8	mΩ
		V <sub>GS</sub> = -10V, I <sub>D</sub> = -20A		5.6	8	
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -20A		48		S
<b>DYNAMIC</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = -15V, f = 1MHz		5251		pF
Output Capacitance	C <sub>oss</sub>			812		
Reverse Transfer Capacitance	C <sub>rss</sub>			724		
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		2		Ω
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> =-20A		120		nC
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>			16		
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>			28		
Turn-On Delay Time <sup>2</sup>	t <sub>d(on)</sub>	V <sub>DS</sub> = -15V, I <sub>D</sub> ≅ -20A, V <sub>GS</sub> = -10V, R <sub>GS</sub> = 6Ω		17		nS
Rise Time <sup>2</sup>	t <sub>r</sub>			77		
Turn-Off Delay Time <sup>2</sup>	t <sub>d(off)</sub>			160		
Fall Time <sup>2</sup>	t <sub>f</sub>			119		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b>						
Continuous Current	I <sub>S</sub>				-33	A
Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> = -20A, V <sub>GS</sub> = 0V			-1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = -20A, dI <sub>F</sub> /dt = 100A / μS		25		nS
Reverse Recovery Charge	Q <sub>rr</sub>				19	

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

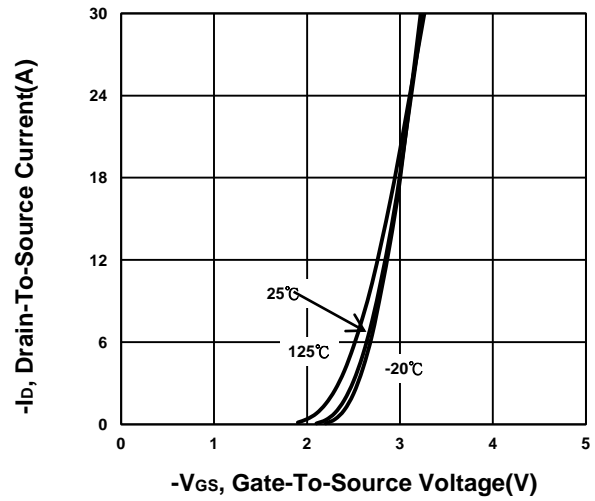
<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Package limitation current is -55A.

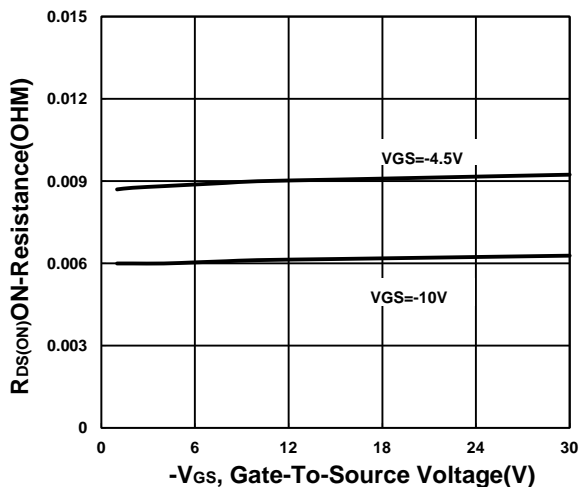
**Output Characteristics**



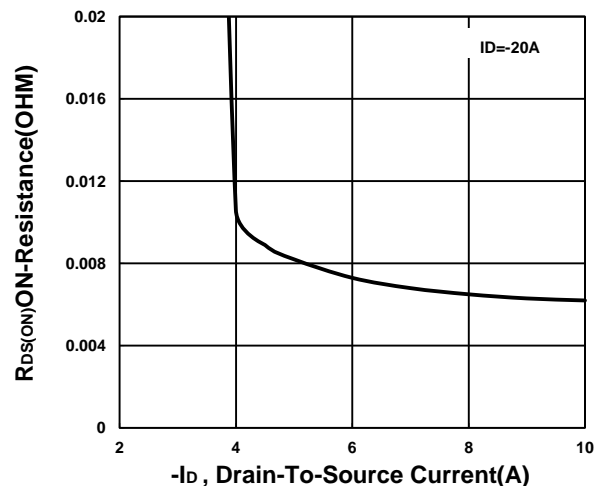
**Transfer Characteristics**



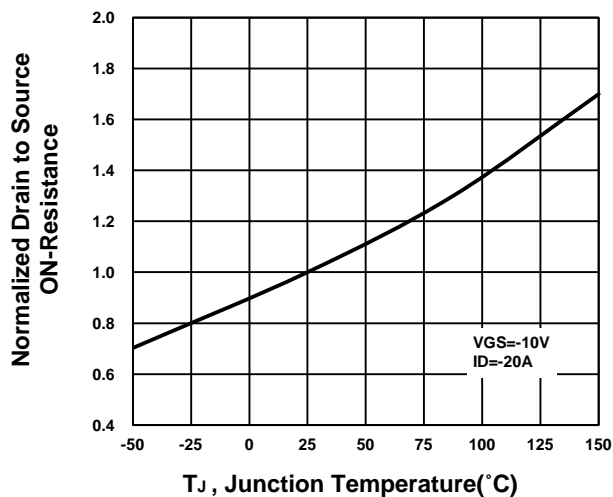
**On-Resistance VS Gate-To-Source**



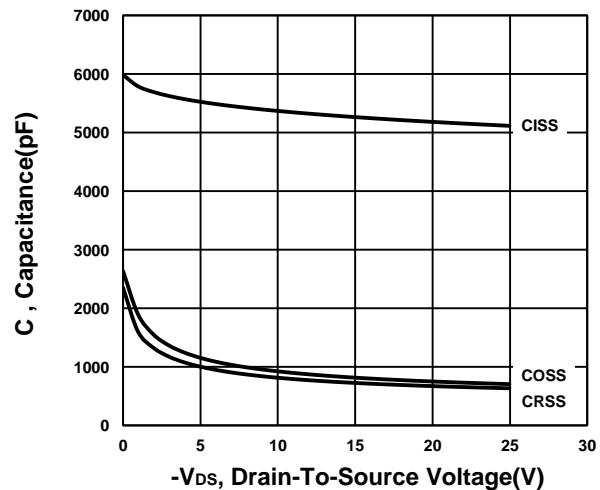
**On-Resistance VS Drain Current**



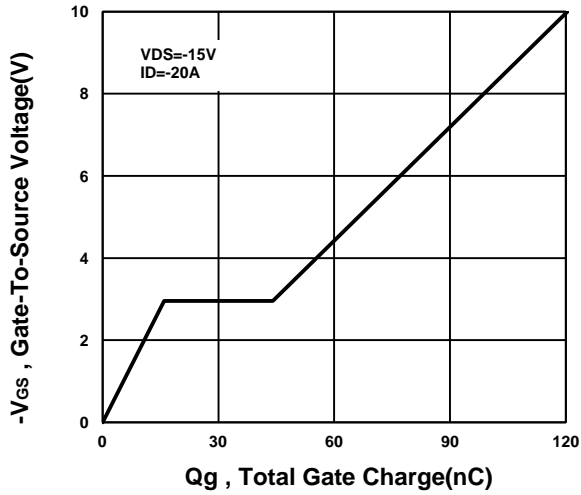
**On-Resistance VS Temperature**



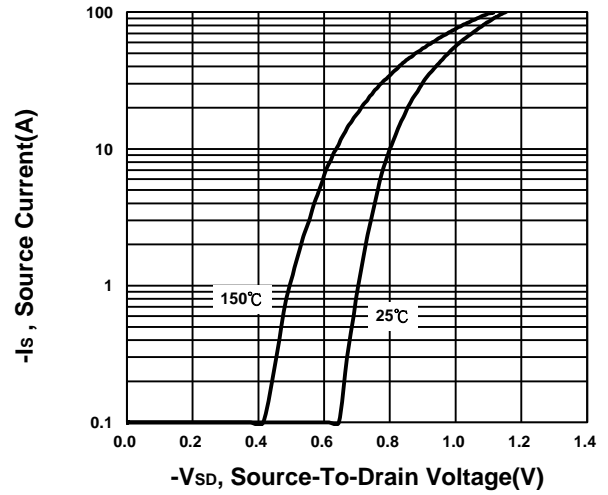
**Capacitance Characteristic**



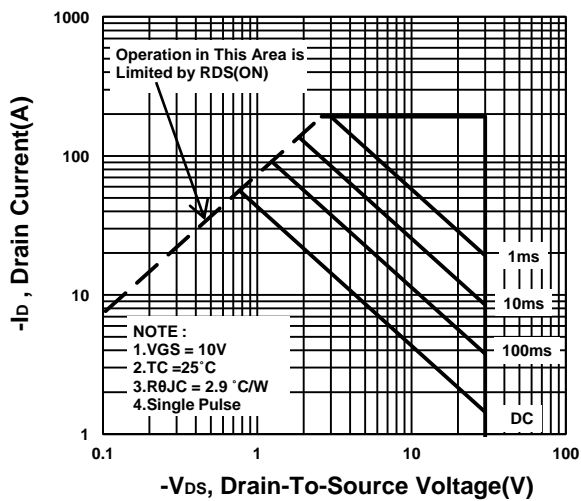
**Gate charge Characteristics**



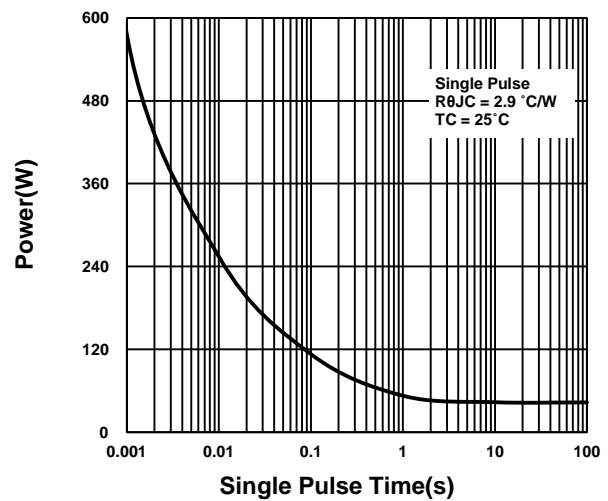
**Source-Drain Diode Forward Voltage**



**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**

