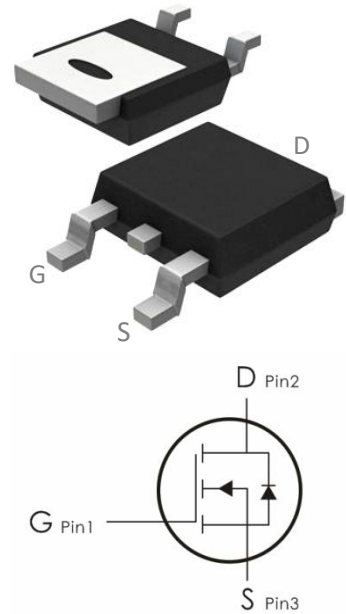


## Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent  $R_{DS(on)}$  with low gate charge. It can be used in a wide variety of applications.

## Features:

- 1)  $V_{DS}=30V, I_D=25A, R_{DS(ON)}<25m\ \Omega @V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low  $R_{DS(ON)}$ .
- 5) Excellent package for good heat dissipation.



## Absolute Maximum Ratings: ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ\text{C}$	25	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	15	
	Continuous Drain Current- $T_A=25^\circ\text{C}$	7.3	
	Continuous Drain Current- $T_A=70^\circ\text{C}$	5.8	
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	50	A
$E_{AS}$	Single Pulse Avalanche Energy <sup>3</sup>	8.1	mJ
$I_{AS}$	Avalanche Current	12.7	A
$P_D$	Power Dissipation <sup>4</sup> , $T_C=25^\circ\text{C}$	20.8	W
	Power Dissipation <sup>4</sup> , $T_A=25^\circ\text{C}$	2	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

**Thermal Characteristics:**

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case <sup>1</sup>	6	°C/W
$R_{\theta JA}$	Thermal Resistance Junction to mbient <sup>1</sup>	62	

**Electrical Characteristics:** ( $T_J=25^\circ\text{C}$  unless otherwise noted)

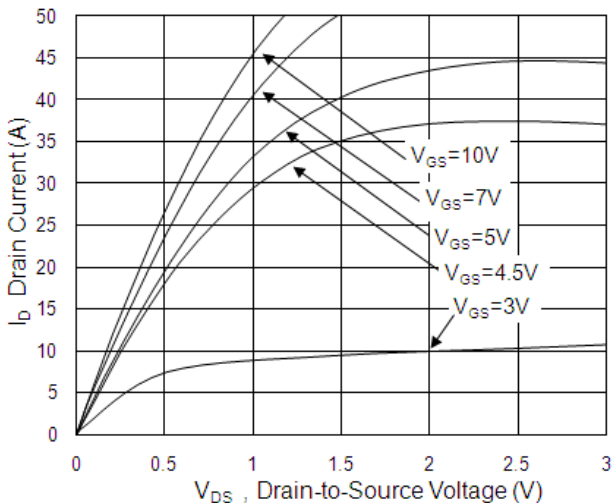
Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	30	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=24V, T_A=25^\circ\text{C}$	---	---	1	$\mu\text{A}$
		$V_{GS}=0V, V_{DS}=24V, T_A=55^\circ\text{C}$	---	---	5	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	0.5	0.9	1.3	V
$R_{DS(on)}$	Drain-Source On Resistance <sup>2</sup>	$V_{GS}=10V, I_D=10A$	---	---	25	m $\Omega$
		$V_{GS}=4.5V, I_D=8A$	---	---	28	m $\Omega$
$G_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=10A$	---	5.5	---	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	410	---	pF
$C_{oss}$	Output Capacitance		---	60	---	
$C_{rss}$	Reverse Transfer Capacitance		---	50	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V, I_D=10A,$ $R_G=3.3\Omega, V_{GS}=10V$	---	1.6	---	ns
$t_r$	Rise Time		---	15.8	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	13	---	ns

<b>t<sub>f</sub></b>	Fall Time		---	4.8	---	ns
<b>Q<sub>g</sub></b>	Total Gate Charge	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =15V, I <sub>D</sub> =10A	---	4.9	---	nC
<b>Q<sub>gs</sub></b>	Gate-Source Charge		---	1.66	---	nC
<b>Q<sub>gd</sub></b>	Gate-Drain "Miller" Charge		---	1.85	---	nC
<b>R<sub>G</sub></b>	Gate Resistance		V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	2.3	---
<b>Drain-Source Diode Characteristics</b>						
<b>I<sub>S</sub></b>	Max. Diode Forward Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	24	A
<b>I<sub>SM</sub></b>	Max. Pulsed Forward Current <sup>2,5</sup>		---	---	50	A
<b>V<sub>SD</sub></b>	Source-Drain Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1.2	V
<b>trr</b>	Reverse Recovery Time	I <sub>F</sub> =10A, T <sub>J</sub> =25°C	---	8.7	---	ns
<b>Qrr</b>	Reverse Recovery Charge	diF/dt=100A/μs	---	1.95	---	nC

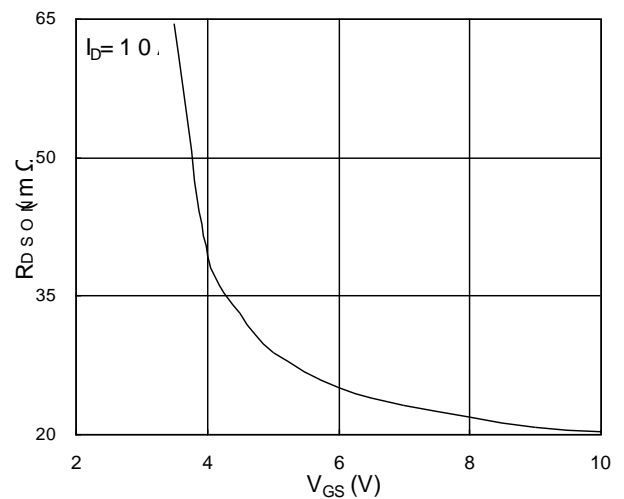
### Notes:

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=25V,V<sub>GS</sub>=10V,L=0.1mH,I<sub>AS</sub>=12.7A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.

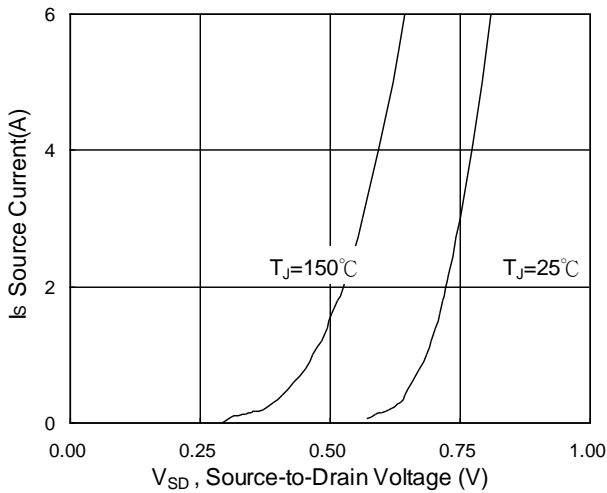
### Typical Characteristics: (T<sub>A</sub>=25°C unless otherwise noted)



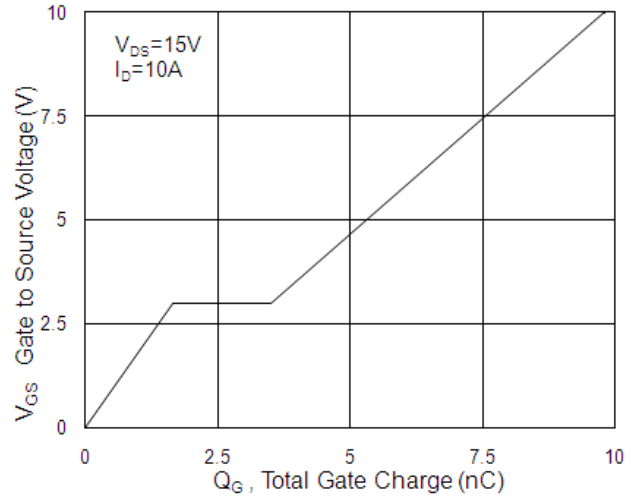
**Fig.1 Typical Output Characteristics**



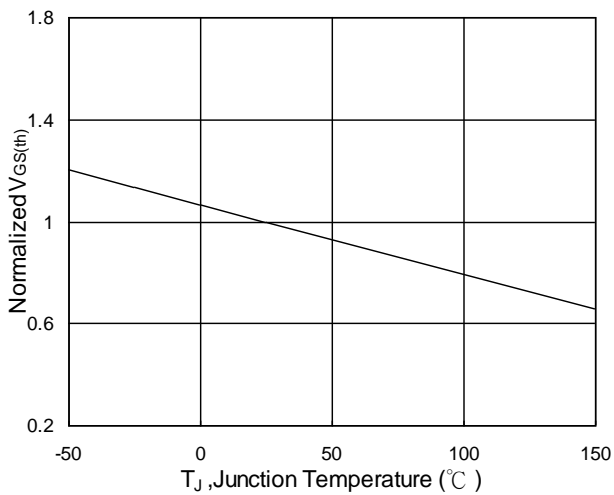
**Fig.2 On-Resistance vs. Gate-Source**



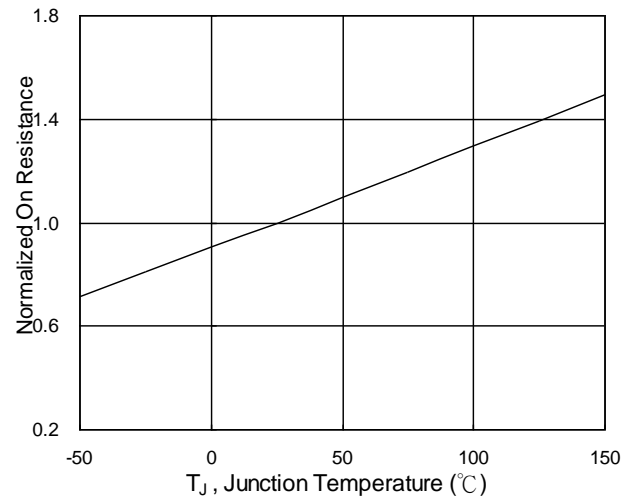
**Fig.3 Forward Characteristics Of Reverse**



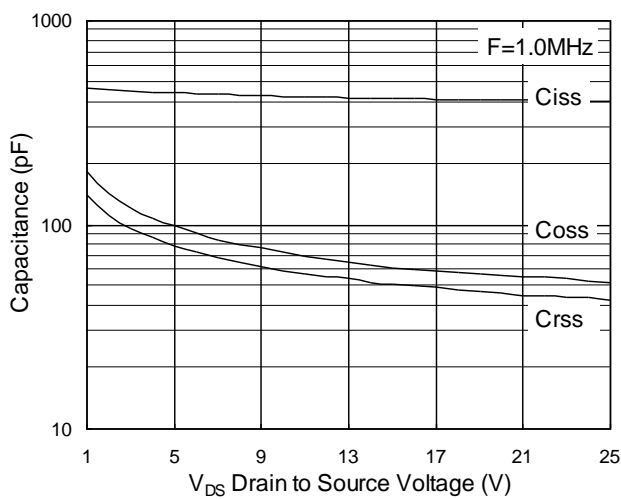
**Fig.4 Gate-Charge Characteristics**



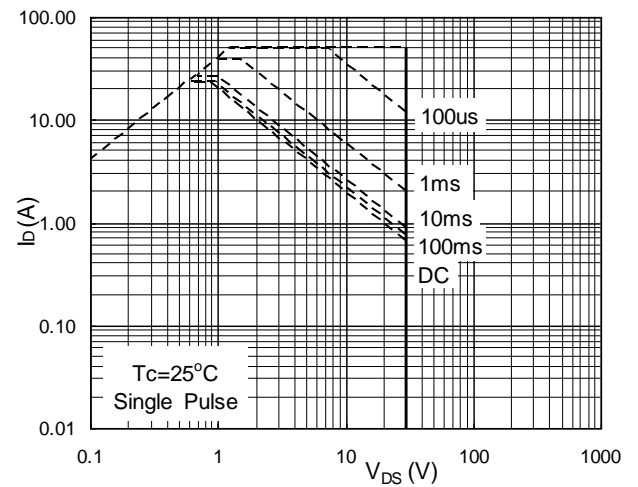
**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$**



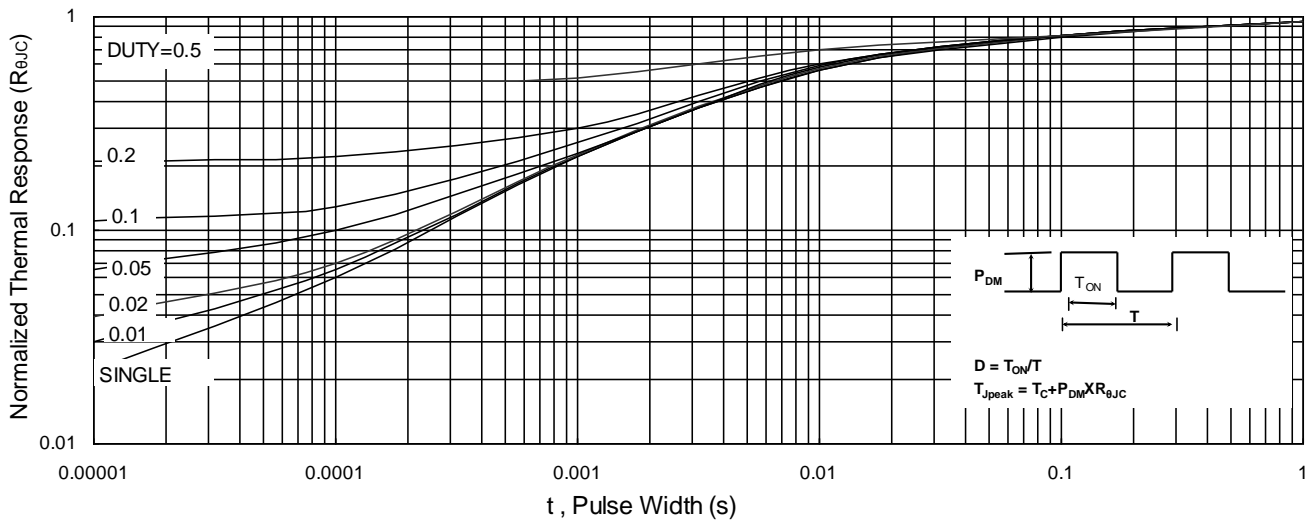
**Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$**



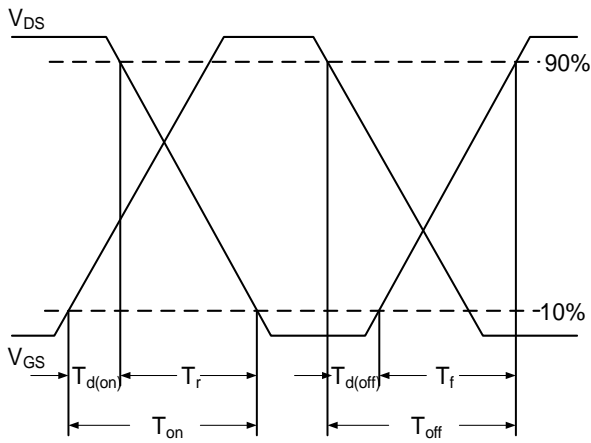
**Fig.7 Capacitance**



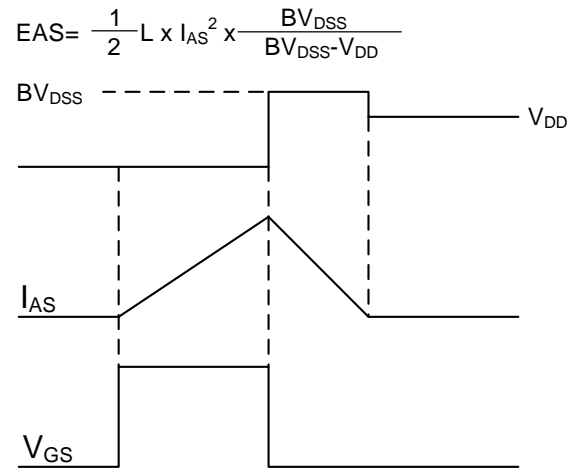
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**



**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Switching Waveform**



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