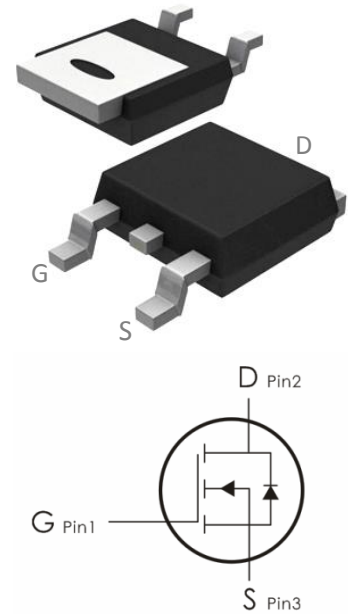


## Description:

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)  $V_{DS}=40V, I_D=30A, R_{DS(ON)} < 16m\ \Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra  $R_{DS(ON)}$ .
- 5) Excellent package for good heat dissipation.



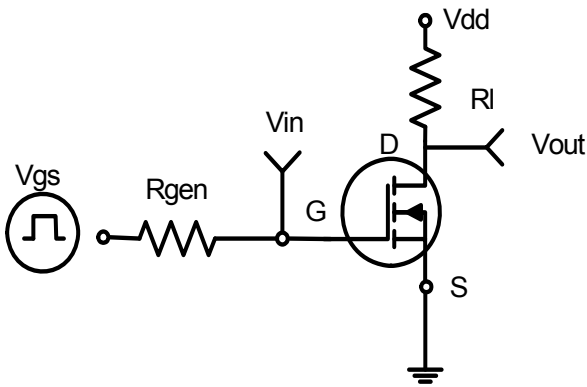
## Absolute Maximum Ratings: ( $T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	40	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ C^1$	30	A
	Continuous Drain Current- $T_C=100^\circ C^1$	21.2	
	Pulsed Drain Current <sup>2</sup>	70	
$P_D$	Power Dissipation, $T_C=25^\circ C^4$	45	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ C$
$R_{\theta JC}$	Thermal Resistance, Junction to Case <sup>2</sup>	3.3	$^\circ C/W$

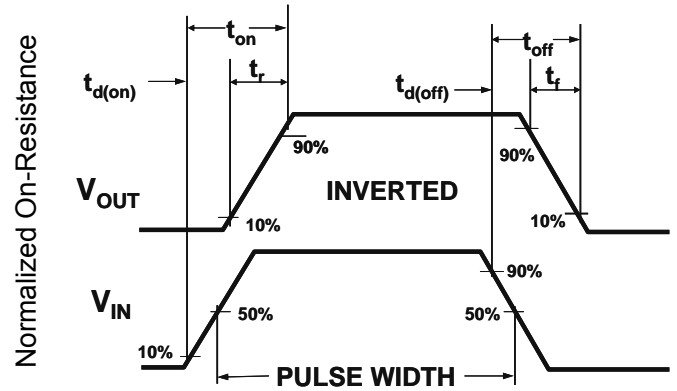
**Electrical Characteristics:** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	40	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=40V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics<sup>3</sup></b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1	1.5	2	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=20A$	---	12.9	16	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=15A$	---	18.9	24	
$G_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=20A$	33	---	---	S
<b>Dynamic Characteristics<sup>4</sup></b>						
$C_{iss}$	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$	---	964	---	pF
$C_{oss}$	Output Capacitance		---	109	---	
$C_{rss}$	Reverse Transfer Capacitance		---	96	---	
<b>Switching Characteristics<sup>4</sup></b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=30V, I_D=1A,$ $V_{GS}=10V, R_{GEN}=3.3\Omega$	---	5.5	---	ns
$t_r$	Rise Time		---	14	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	24	---	ns
$t_f$	Fall Time		---	12	---	ns
$Q_g$	Total Gate Charge	$V_{GS}=10V, V_{DS}=20V,$ $I_D=20A$	---	22.9	---	nC
$Q_{gs}$	Gate-Source Charge		---	3.5	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	5.3	---	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage <sup>3</sup>	$V_{GS}=0V, I_S=30A$	---	---	1.2	V

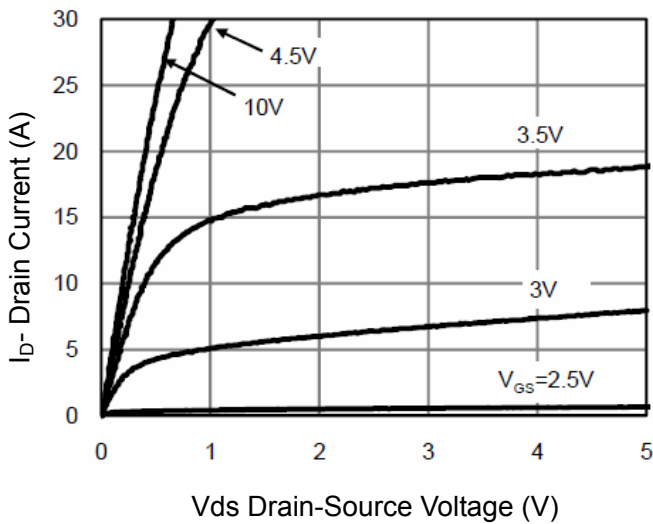
Typical Characteristics: ( $T_c=25^\circ\text{C}$  unless otherwise noted)



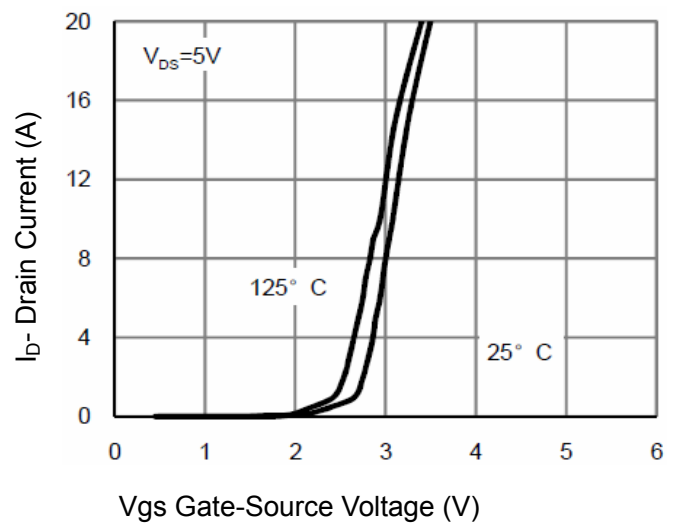
**Figure 1: Switching Test Circuit**



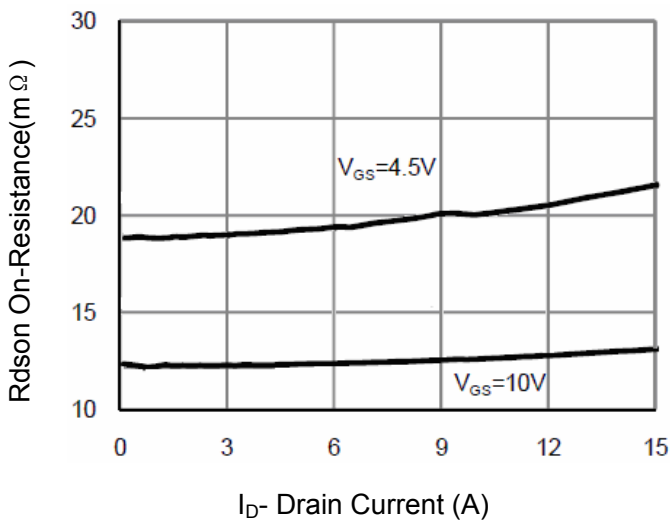
**Figure 2: Switching Waveforms**



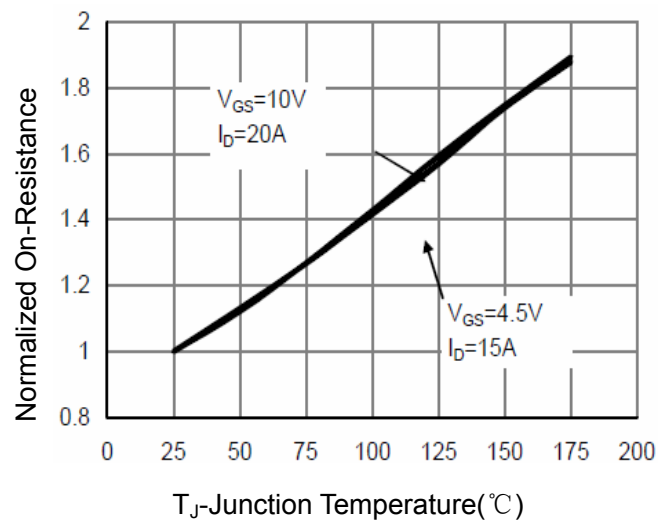
**Figure 3 Output Characteristics**



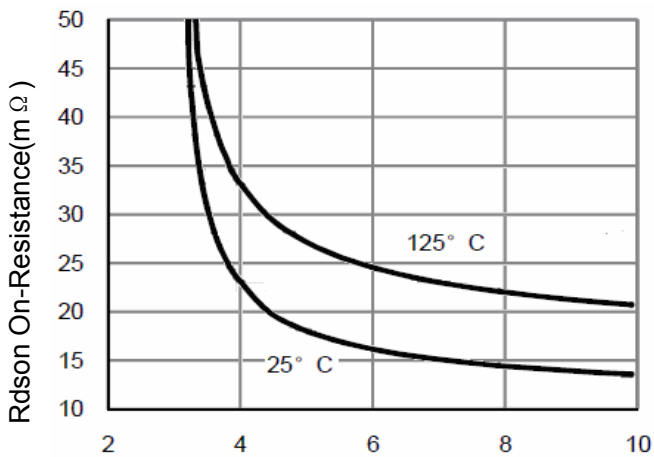
**Figure 4 Transfer Characteristics**



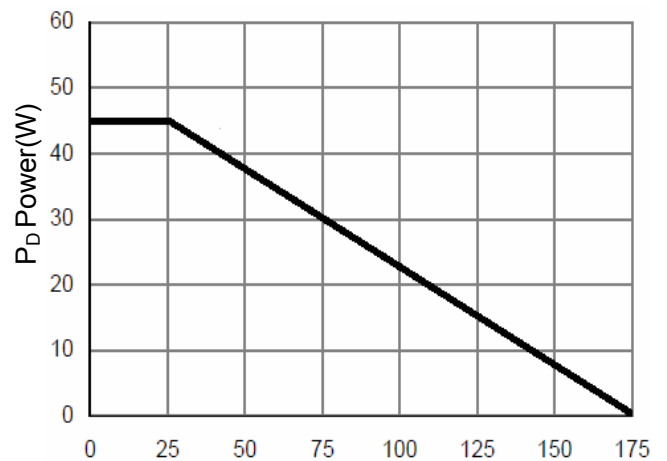
**Figure 5 Drain-Source On-Resistance**



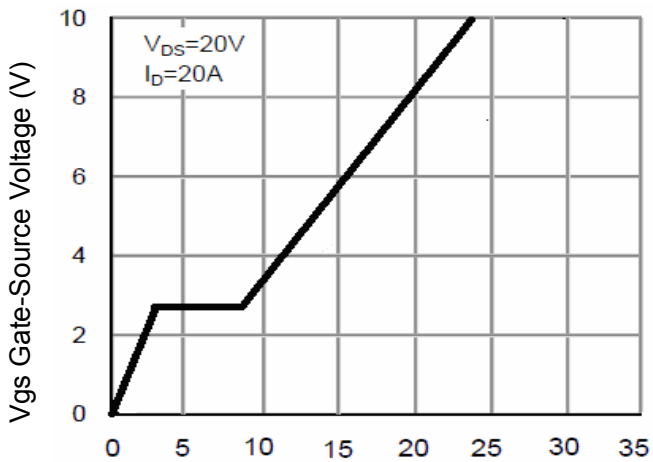
**Figure 6 Drain-Source On-Resistance**



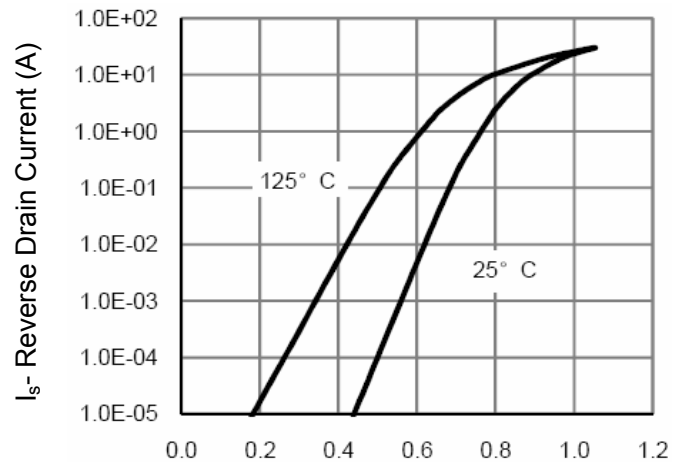
Vgs Gate-Source Voltage (V)  
**Figure 7 Rdson vs Vgs**



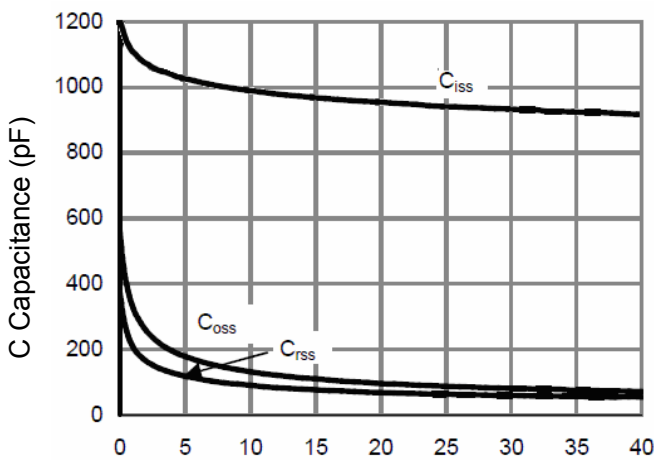
T<sub>J</sub>-Junction Temperature(°C)  
**Figure 8 Power Dissipation**



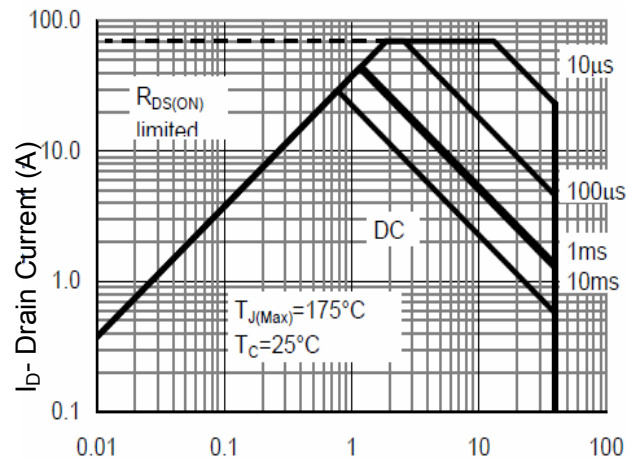
Qg Gate Charge (nC)  
**Figure 9 Gate Charge**



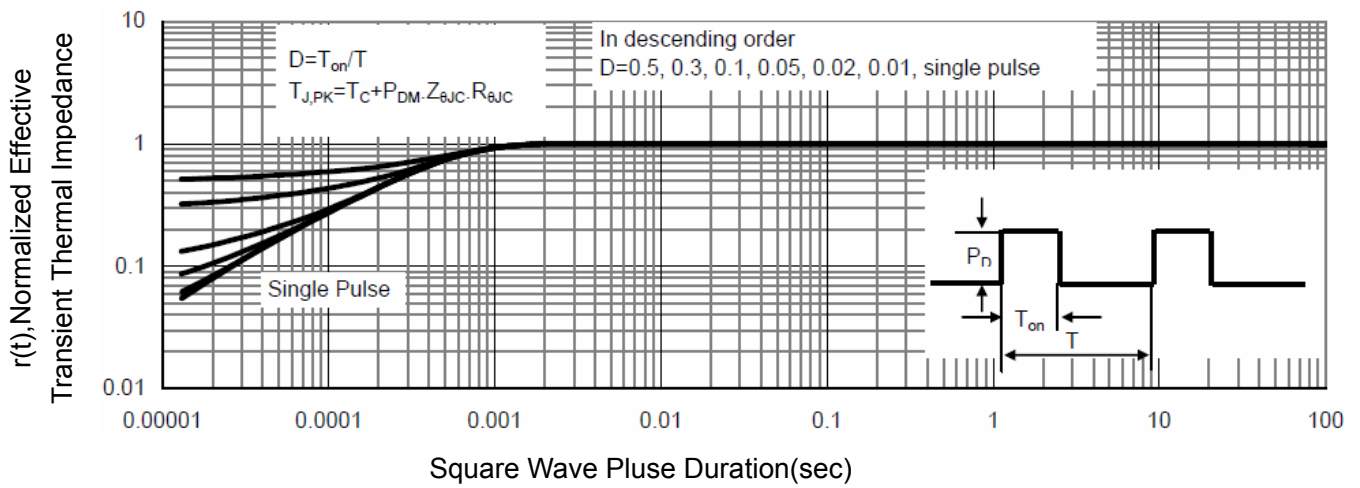
Vds Drain-Source Voltage (V)  
**Figure 10 Source- Drain Diode Forward**



Vds Drain-Source Voltage (V)  
**Figure 11 Capacitance vs Vds**



Vds Drain-Source Voltage (V)  
**Figure 12 Safe Operation Area**



**Figure 13 Normalized Maximum Transient Thermal Impedance**



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