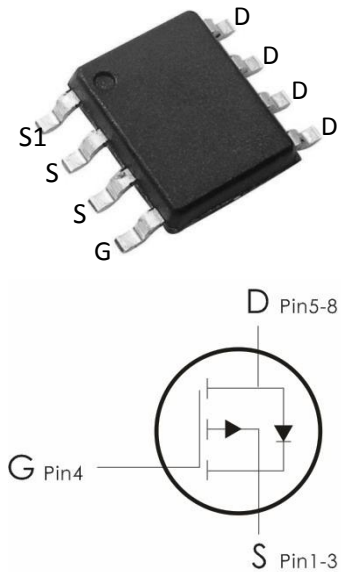


## Description:

This P-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)  $V_{DS}=-30V, I_D=-5.1A, R_{DS(ON)}<55m\ \Omega$  @  $V_{GS}=-10V$
- 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	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ C$	-5.1	A
	Continuous Drain Current- $T_C=100^\circ C$	---	
	Pulsed Drain Current <sup>1</sup>	-20	
$P_D$	Power Dissipation <sup>4</sup>	2.5	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

## Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient <sup>2</sup>	50	

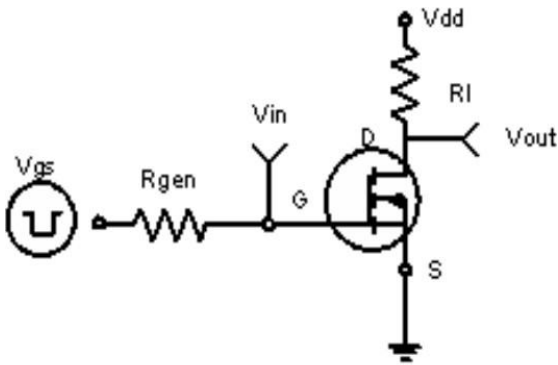
Electrical Characteristics: ( $T_c=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-30	-33	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-24V$	---	---	-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	-1.6	-3	V
$R_{DS(ON)}$	Drain-Source On Resistance <sup>2</sup>	$V_{GS}=-10V, I_D=-5.1A$	---	43	55	$m\ \Omega$
		$V_{GS}=-4.5V, I_D=-4.2A$	---	62	90	
$G_{FS}$	Forward Transconductance	$V_{DS}=-15V, I_D=-5.1A$	4	7	---	S
<b>Dynamic Characteristics<sup>4</sup></b>						
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	980	---	pF
$C_{oss}$	Output Capacitance		---	390	---	
$C_{rss}$	Reverse Transfer Capacitance		---	135	---	
<b>Switching Characteristics<sup>4</sup></b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V, I_D=-1A, R_{GEN}=6\ \Omega$	---	14	---	ns
$t_r$	Rise Time		---	12	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	56	---	ns
$t_f$	Fall Time		---	20	---	ns
$Q_g$	Total Gate Charge	$V_{GS}=-10V, V_{DS}=-15V, I_D=-5.1A$	---	11	---	nC
$Q_{gs}$	Gate-Source Charge		---	2	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	2.8	---	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage <sup>3</sup>	$V_{GS}=0V, I_S=-5.1A$	---	---	-1.2	V

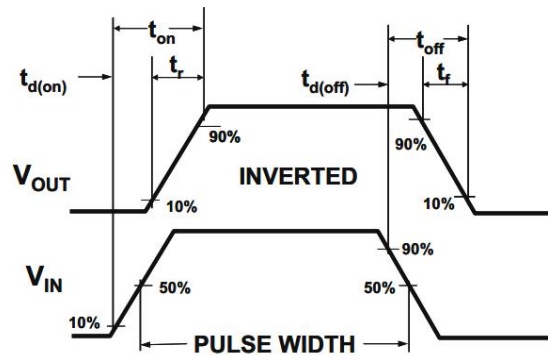
## Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production.

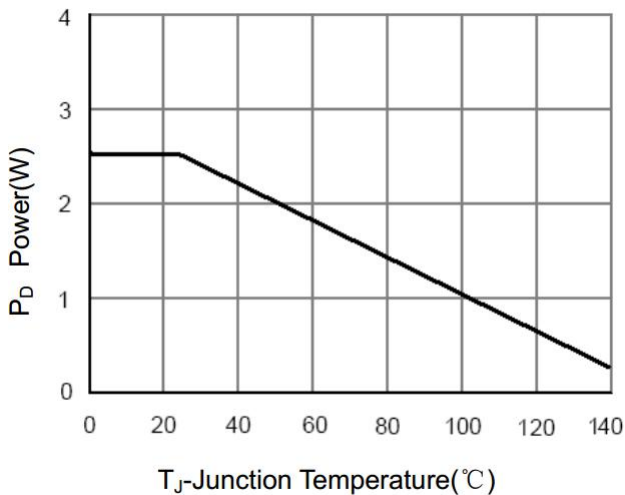
Typical Characteristics: ( $T_c=25^\circ\text{C}$  unless otherwise noted)



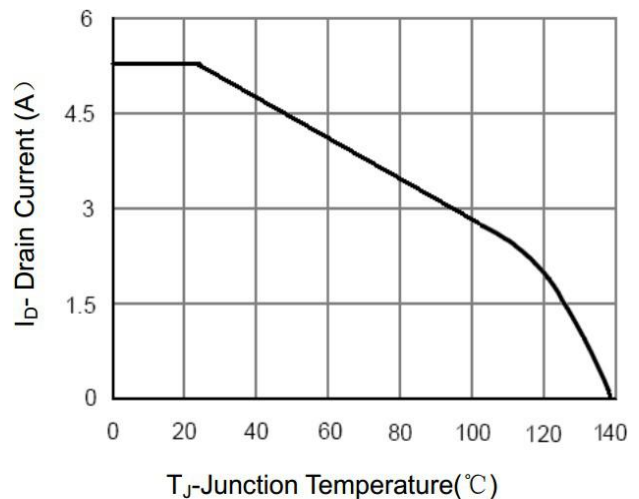
**Figure 1: Switching Test Circuit**



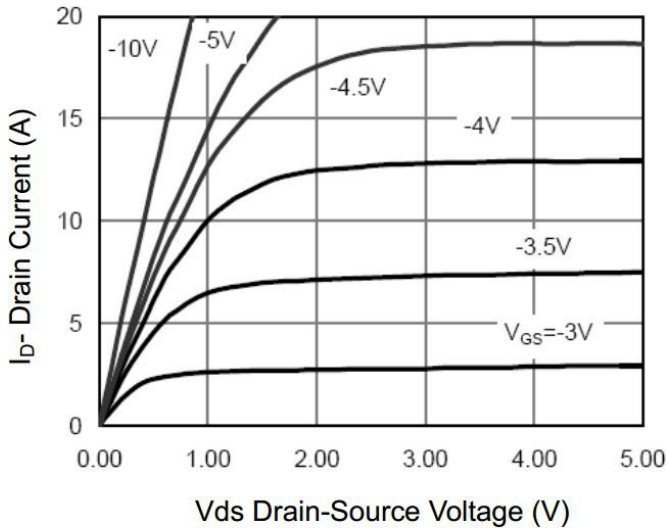
**Figure 2: Switching Waveforms**



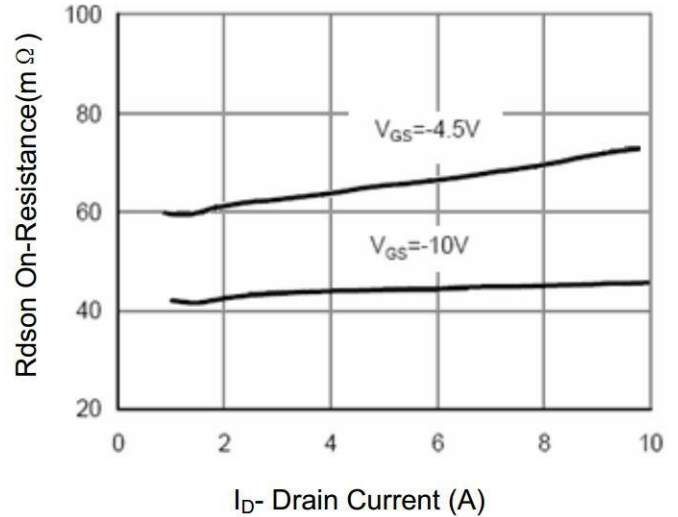
**Figure 3 Power Dissipation**



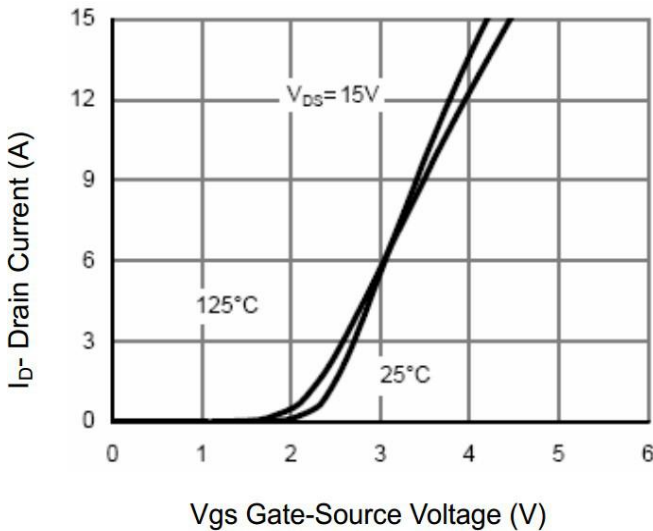
**Figure 4 Drain Current**



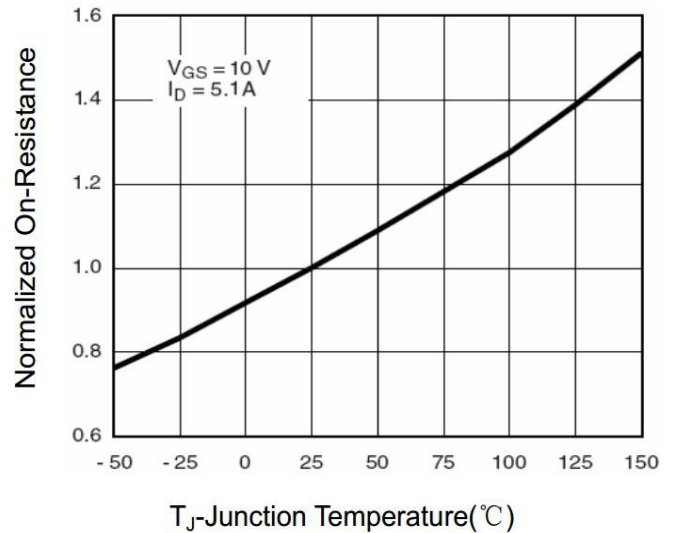
**Figure 5 Output Characteristics**



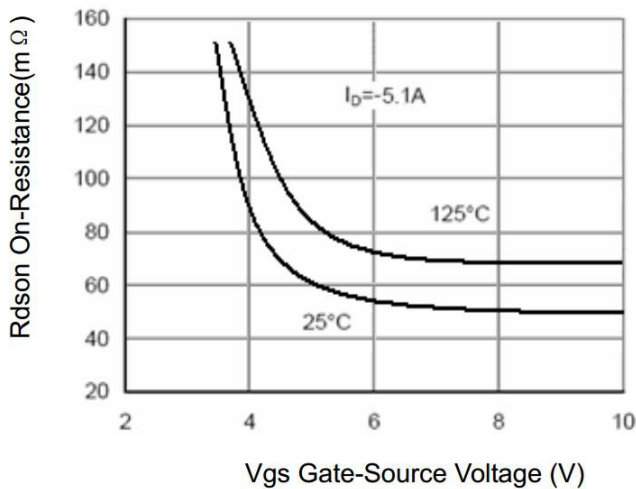
**Figure 6 Drain-Source On-Resistance**



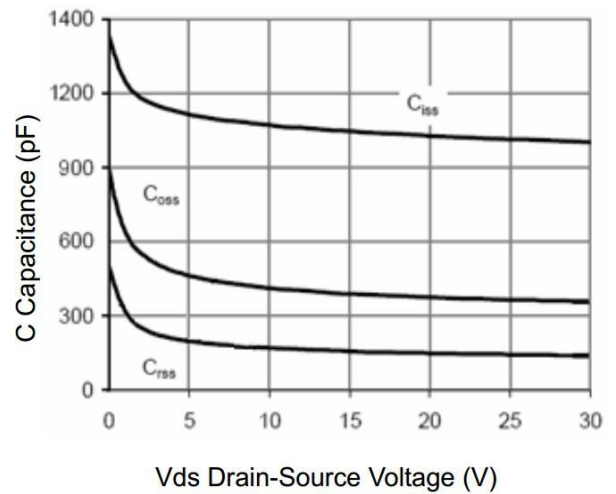
**Figure 7 Transfer Characteristics**



**Figure 8 Drain-Source On-Resistance**



**Figure 9 Rds(on) vs Vgs**



**Figure 10 Capacitance vs Vds**

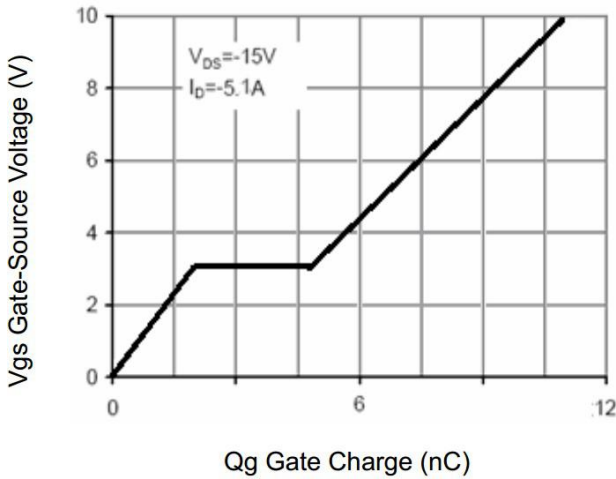


Figure 11 Gate Charge

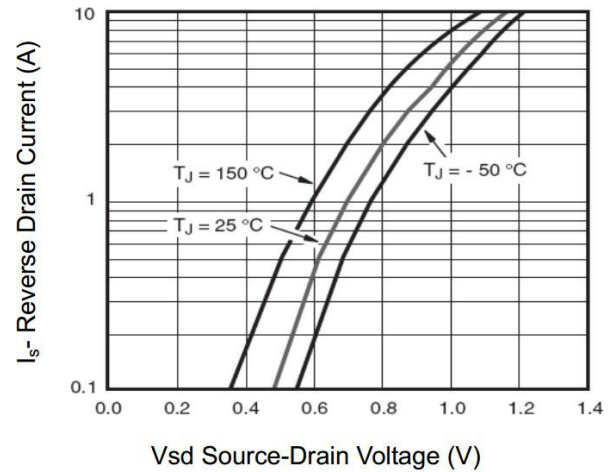


Figure 12 Source- Drain Diode Forward

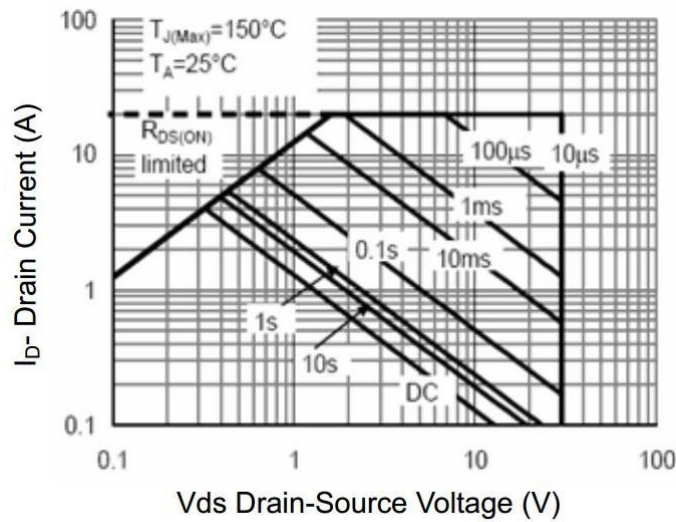


Figure 13 Safe Operation Area

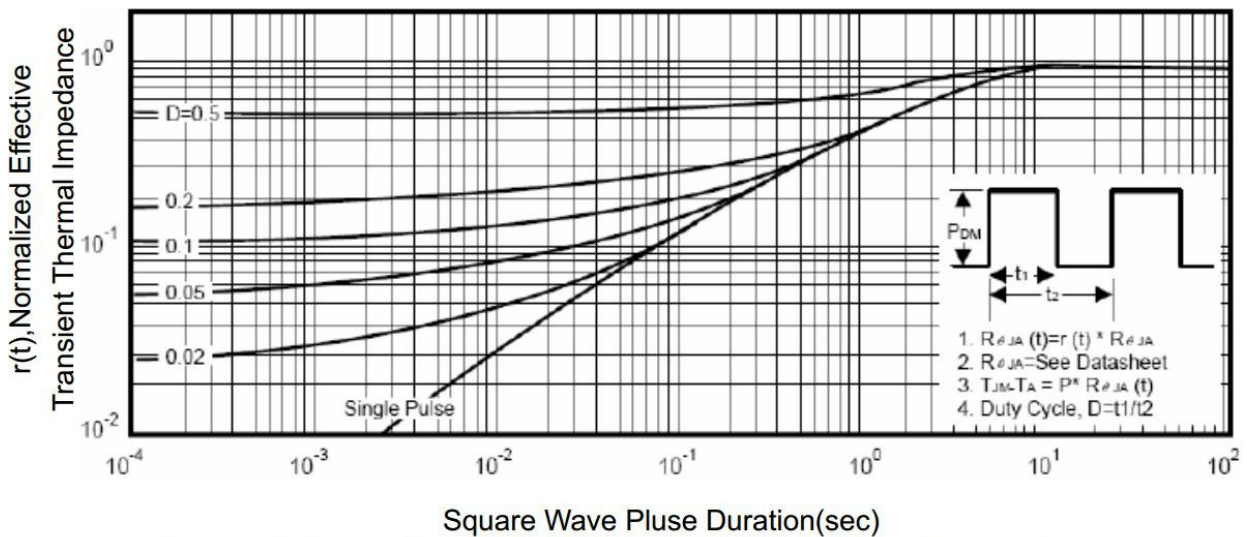


Figure 14 Normalized Maximum Transient Thermal Impedance

