



# 30V N-Channel MOSFETs

## General Description

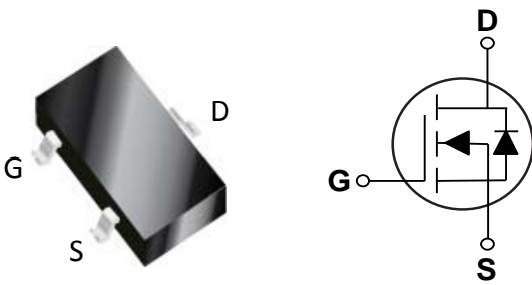
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

$BV_{DSS}$	$R_{DS(ON)}$	$I_D$
30 V	39 mΩ	5.8 A

## Features

- $R_{DS(ON)} \leq 39m\Omega @ V_{GS}=10V$
- High power and current handling capability
- Fast switching
- Lead free product is acquired

SOT-23 Pin Configuration



## Applications

- PWM applications
- Load Switch
- Power management

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

Symbol	Parameter	Rating	Unit
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Drain Current - Continuous	5.8	A
$I_{DM}$	Drain Current - Pulsed (NOTE 1)	30	A
$P_D$	Power Dissipation	1.4	W
$T_J$	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-50 to 150	$^\circ\text{C}$

## Thermal Characteristics

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	89	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	33	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=30V, V_{GS}=0V$	---	---	1	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 100$	nA

**On Characteristics (NOTE 2)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=5.8A$	---	27	39	m $\Omega$
		$V_{GS}=4.5V, I_D=5A$	---	30	43	
		$V_{GS}=2.5V, I_D=4A$	---	44	57	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.7	0.9	1.4	V
gfs	Forward Transconductance	$V_{DS}=5V, I_D=5A$	10	---	---	S

**Dynamic and switching Characteristics (NOTE 3)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$Q_g$	Total Gate Charge	$V_{DS}=15V, V_{GS}=4.5V, I_D=5.8A$	---	9.5	---	nC
$Q_{gs}$	Gate-Source Charge		---	1.5	---	
$Q_{gd}$	Gate-Drain Charge		---	3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V, V_{GS}=10V, R_L=2.7\Omega, R_{GEN}=3\Omega$	---	3.3	---	nS
$T_r$	Rise Time		---	4.8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	26	---	
$T_f$	Fall Time		---	4	---	
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, F=1\text{MHz}$	---	820	---	pF
$C_{oss}$	Output Capacitance		---	99	---	
$C_{rss}$	Reverse Transfer Capacitance		---	77	---	

**Drain-Source Diode Characteristics and Ratings**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current		---	---	5.8	A
$V_{SD}$	Diode Forward Voltage (NOTE 2)	$V_{GS}=0V, I_S=5.8A$	---	---	1.2	V

## NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
3. Guaranteed by design, not subject to production.



Characteristics Curves

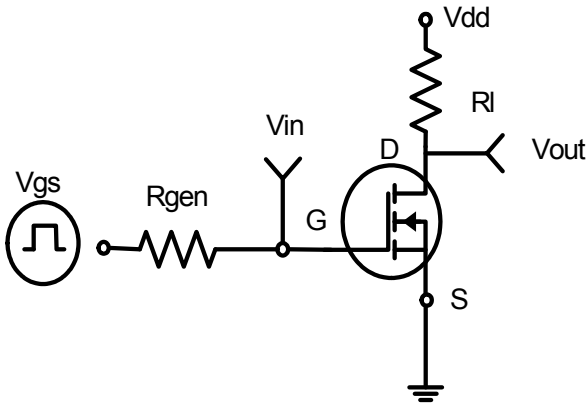


Figure 1 Switching Test Circuit

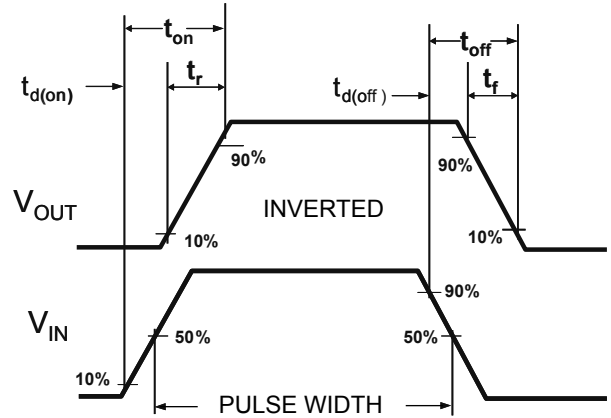


Figure 2 Switching Waveforms

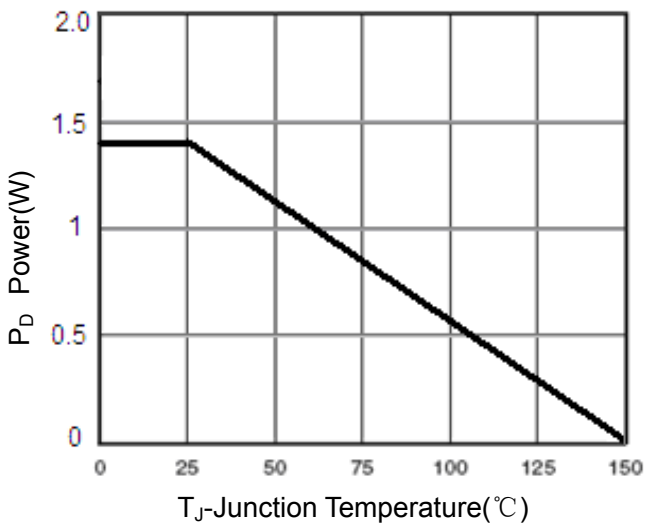


Figure 3 Power Dissipation

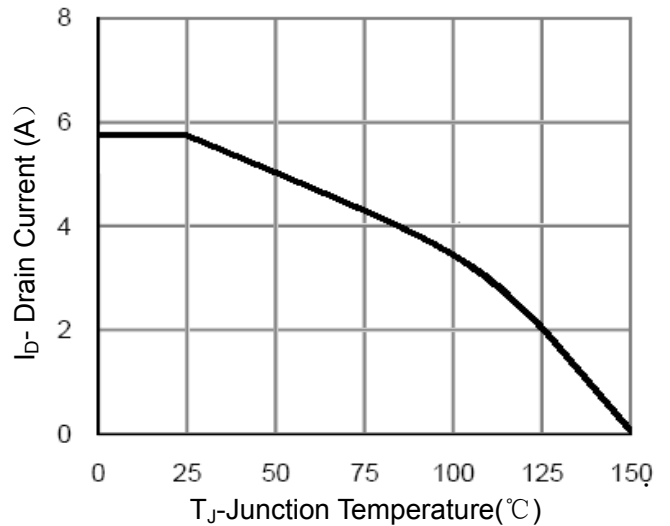


Figure 4 Drain Current

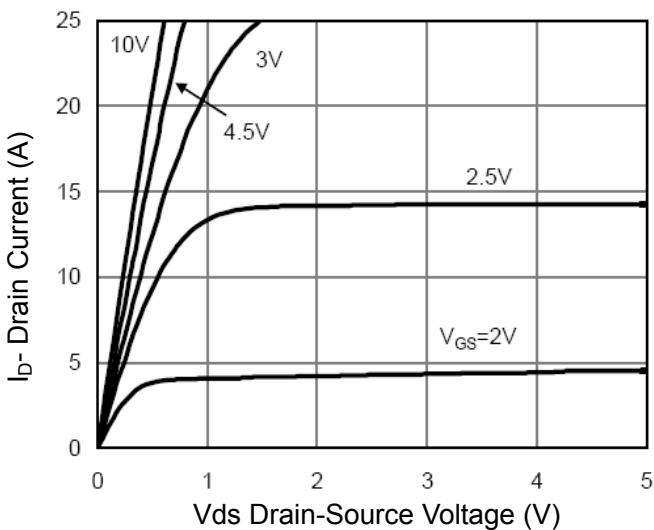


Figure 5 Output Characteristics

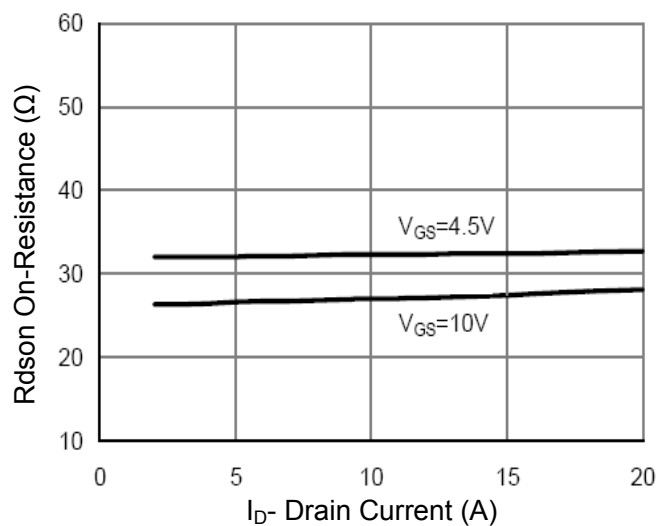


Figure 6 Drain-Source On-Resistance



Characteristics Curves

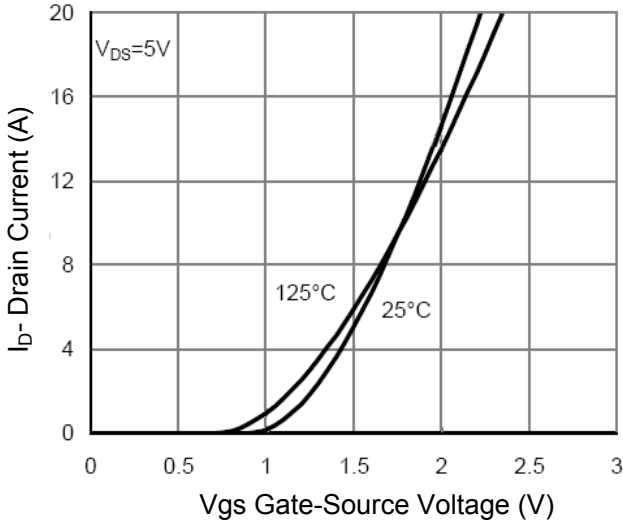


Figure 7 Transfer Characteristics

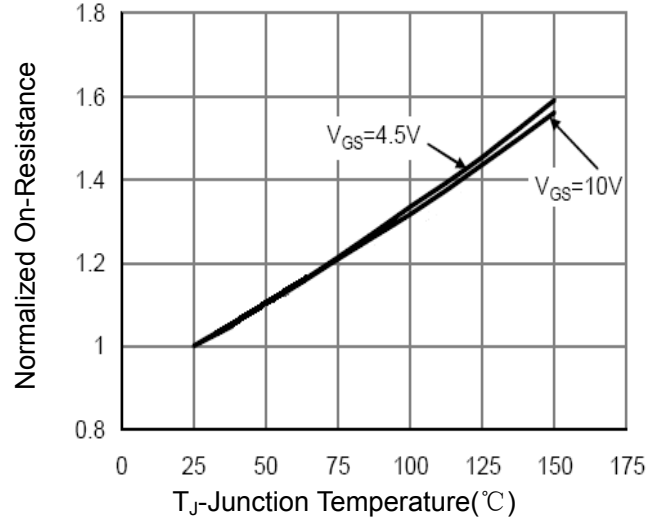


Figure 8 Drain-Source On-Resistance

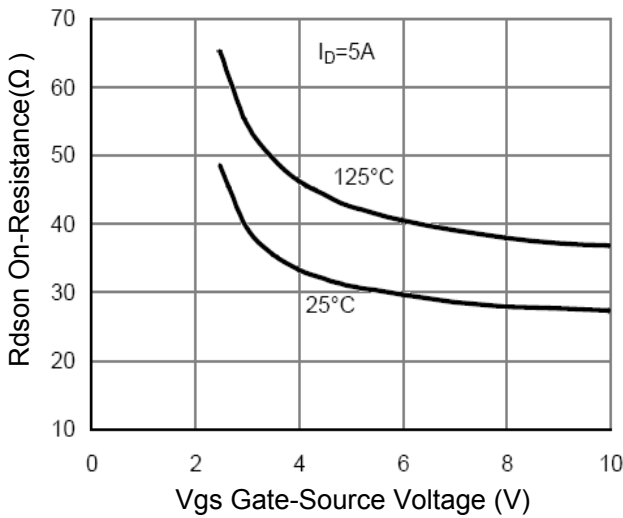


Figure 9 Rdson vs Vgs

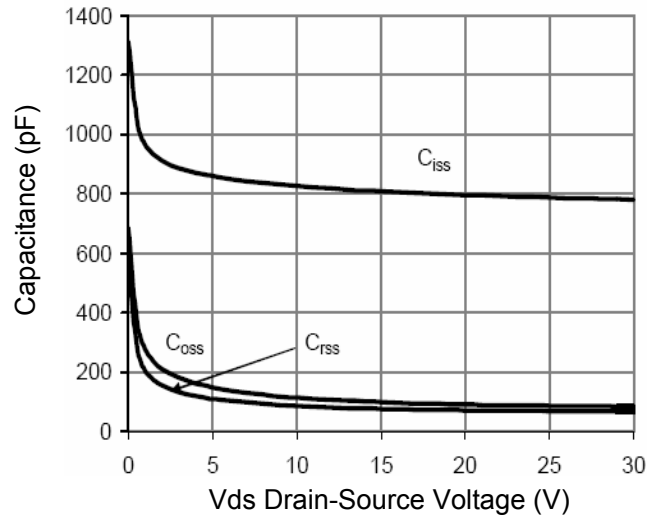


Figure 10 Capacitance vs Vds

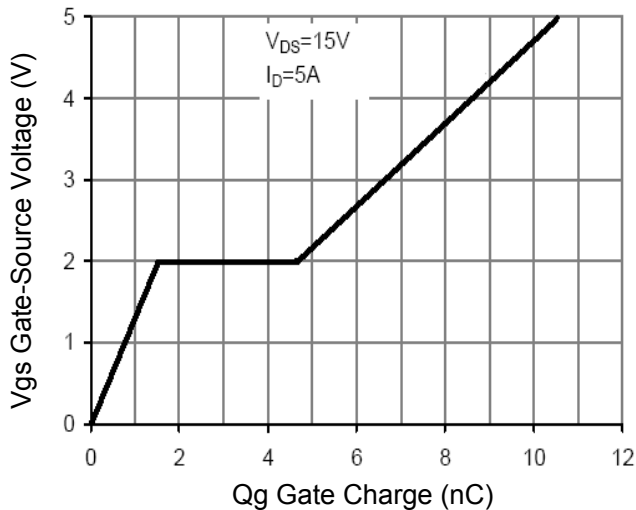


Figure 11 Gate Charge

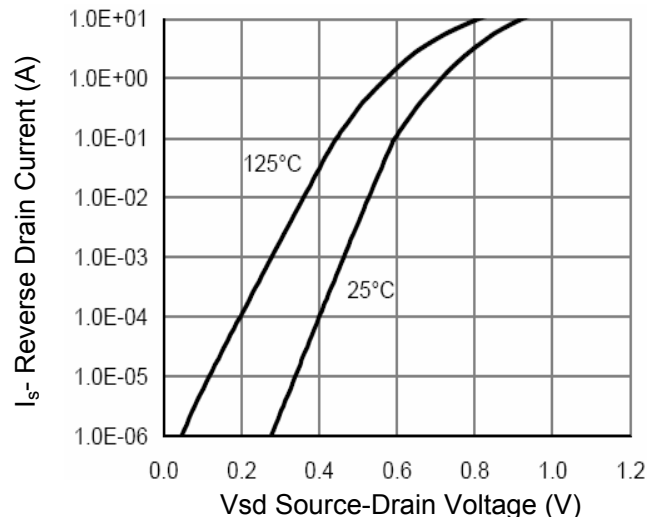


Figure 12 Source-Drain Diode Forward



Characteristics Curves

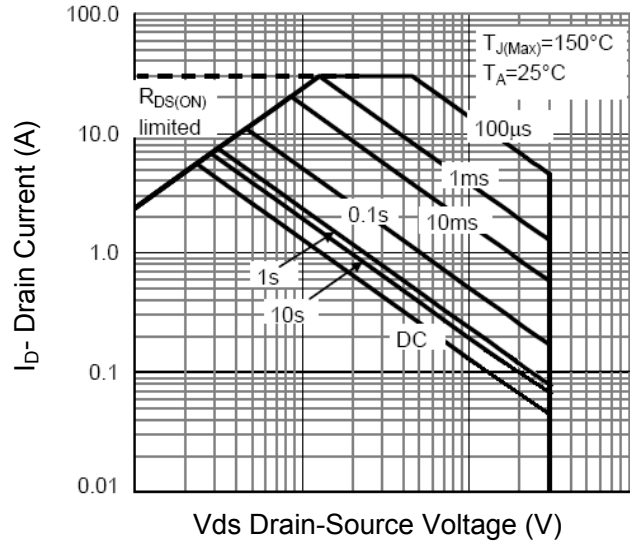


Figure 13 Safe Operation Area

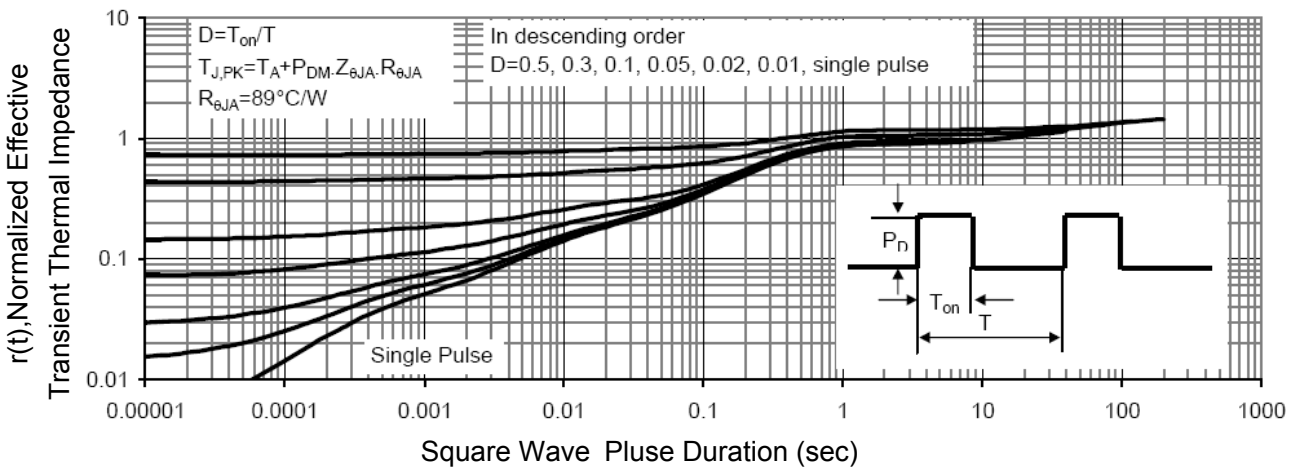
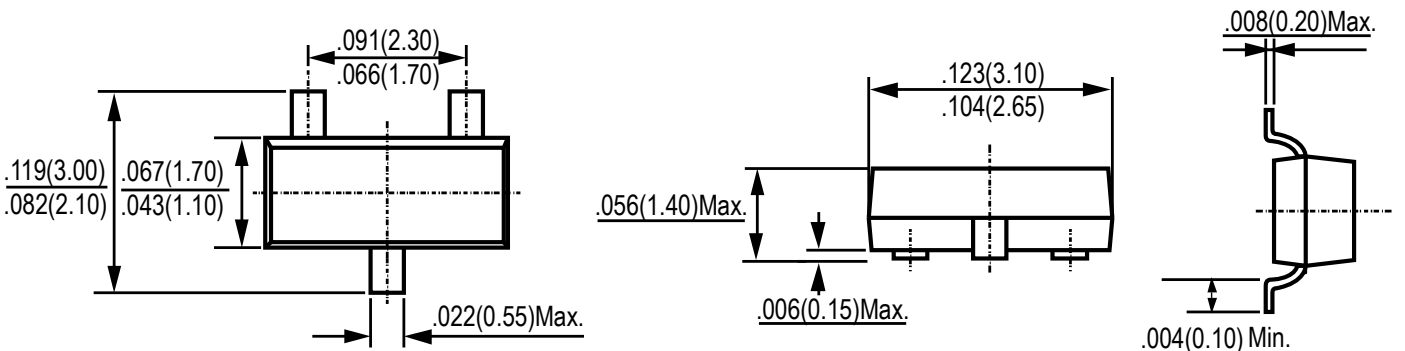


Figure 14 Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions



SOT-23

Dimensions in inches and (millimeters)



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