



30V N-Channel MOSFETs

General Description

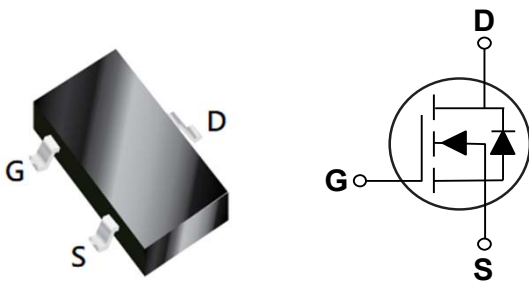
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV _{DSS}	R _{DS(ON)}	I _D
30 V	41 mΩ	5.8 A

Features

- $R_{DS(ON)} \leq 41m\Omega @ V_{GS}=10V$
- 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°C unless otherwise noted

Symbol	Parameter	Rating	Unit
V _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-Source Voltage	±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	°C
T _{STG}	Storage Temperature Range	-50 to 150	°C
Marking Code		A09T	

Thermal Characteristics

Symbol	Parameter	Typ	Max	Unit
R _{θJA}	Thermal Resistance Junction to Ambient	---	89	°C/W



Electrical Characteristics (T_J=25°C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	33	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =24V, V _{GS} =0V	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±12V, V _{DS} =0V	---	---	±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	---	28	41	mΩ
		V _{GS} =4.5V, I _D =5A	---	31	45	
		V _{GS} =2.5V, I _D =4A	---	45	59	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.7	0.9	1.4	V
g _{fs}	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 =2.7Ω, R _{GEN} =3Ω	---	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=1MHz	---	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 ≤ 300us , duty cycle ≤ 2%.
3. Guaranteed by design, not subject to production.



Characteristics Curves

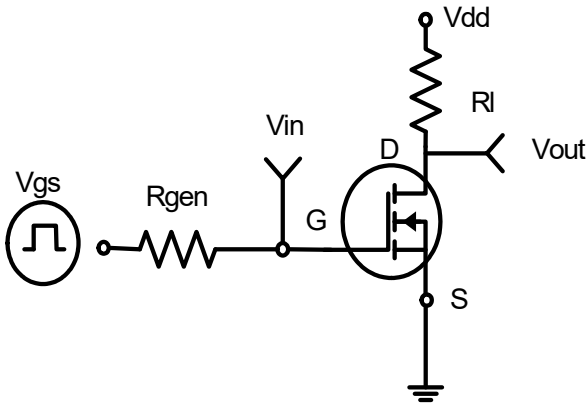


Figure 1 Switching Test Circuit

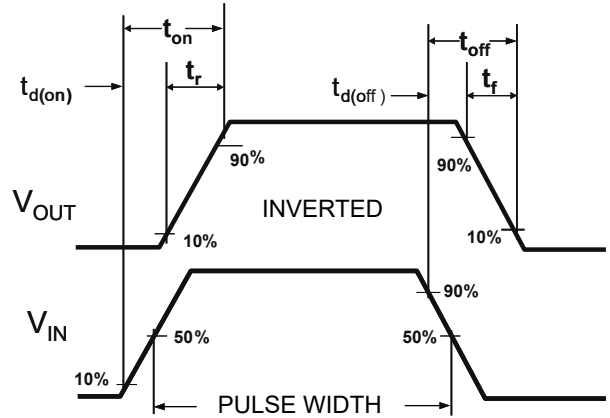


Figure 2 Switching Waveforms

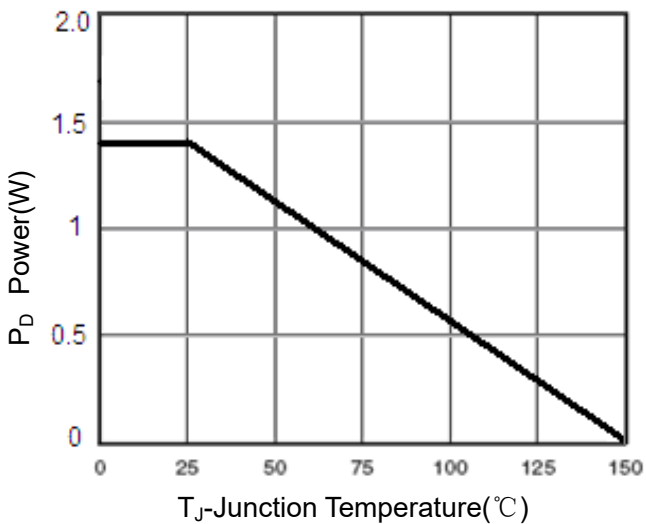


Figure 3 Power Dissipation

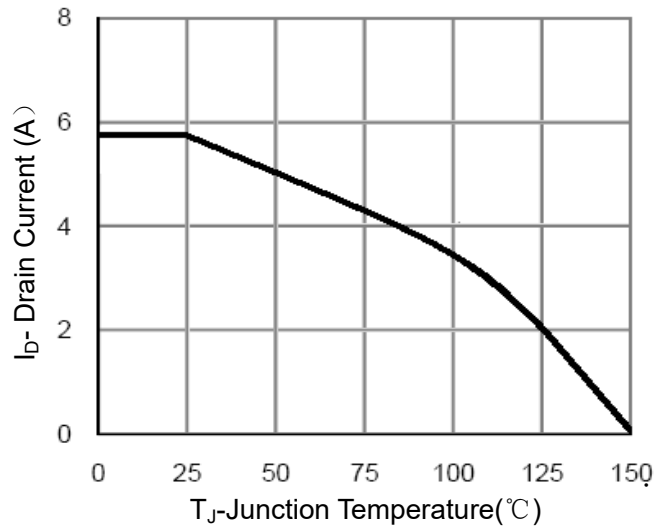


Figure 4 Drain Current

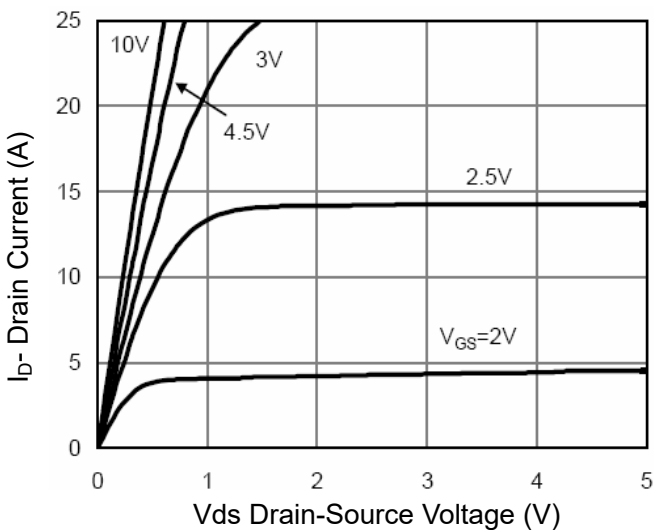


Figure 5 Output Characteristics

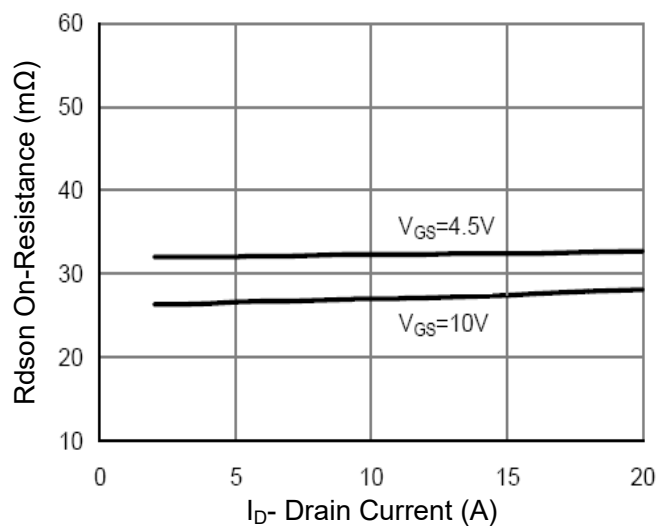


Figure 6 Drain-Source On-Resistance



Characteristics Curves

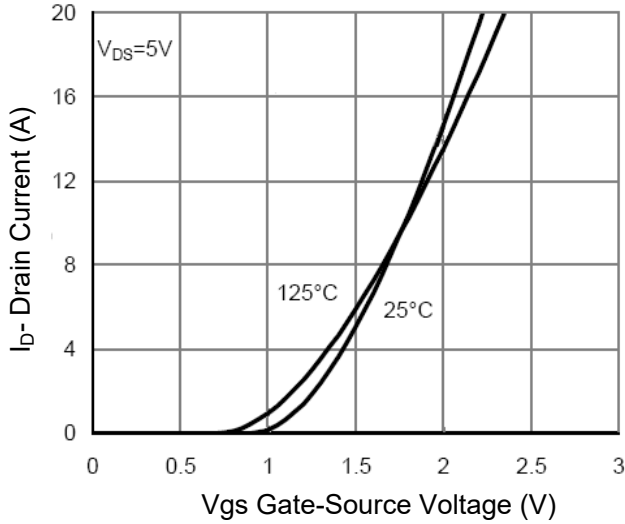


Figure 7 Transfer Characteristics

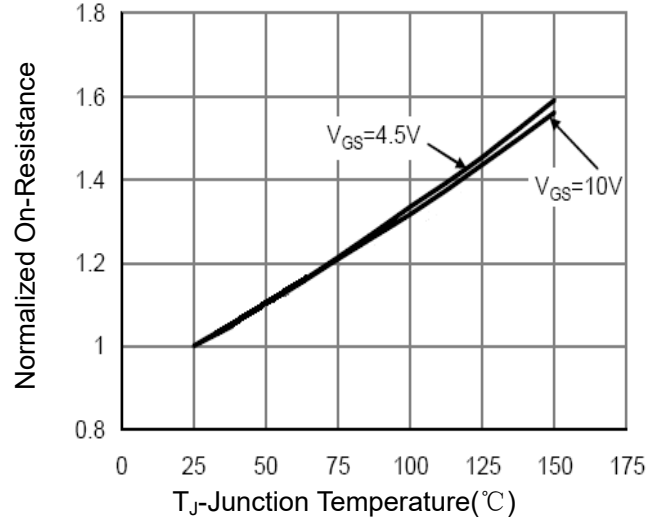


Figure 8 Drain-Source On-Resistance

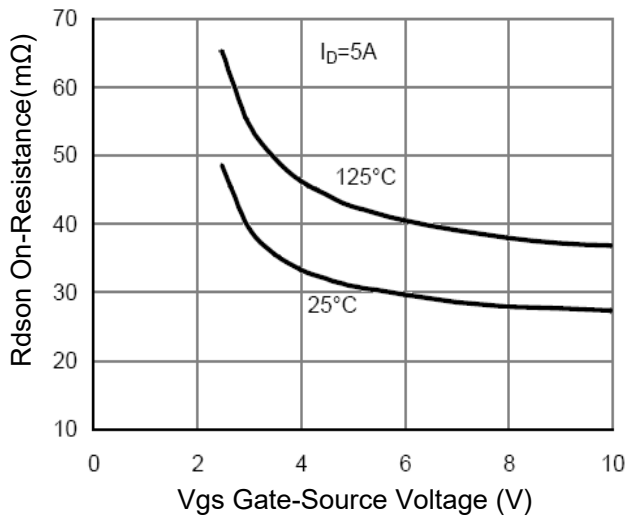


Figure 9 Rdson vs Vgs

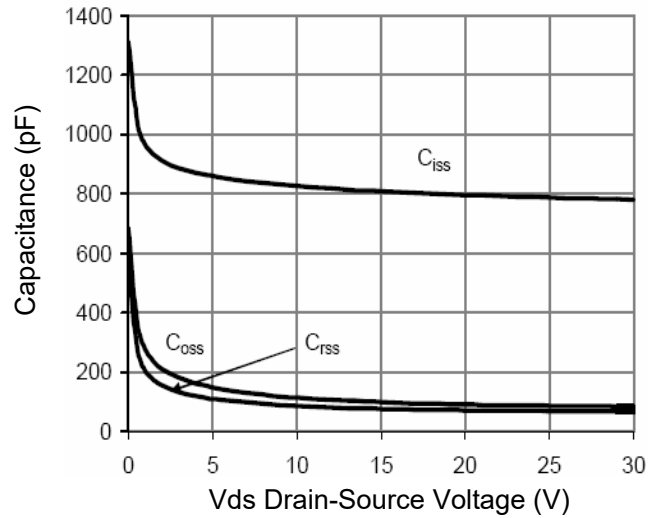


Figure 10 Capacitance vs Vds

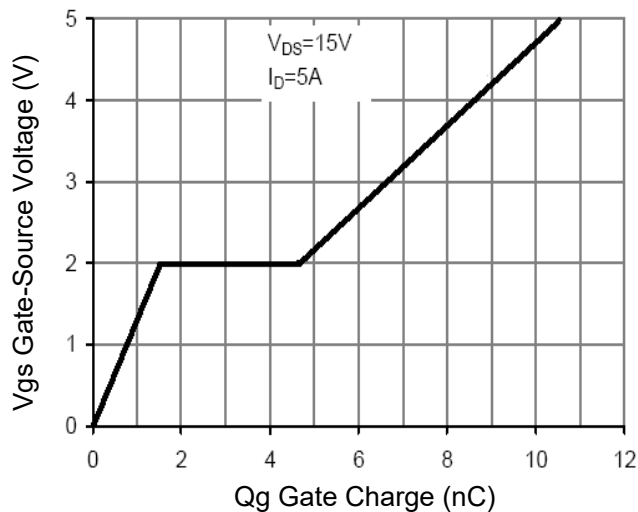


Figure 11 Gate Charge

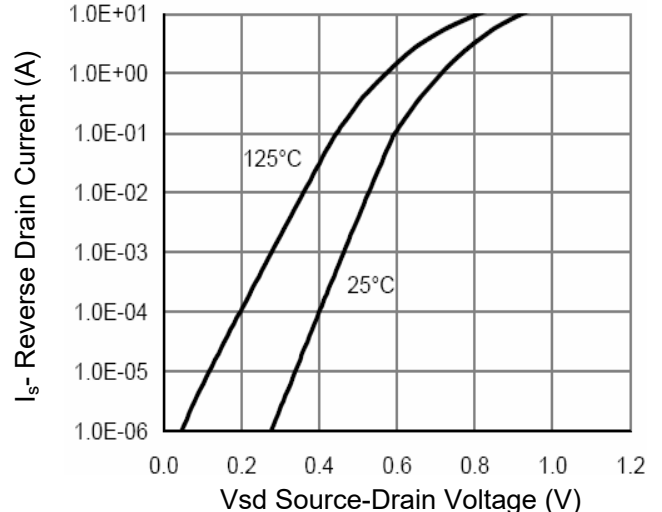


Figure 12 Source-Drain Diode Forward



Characteristics Curves

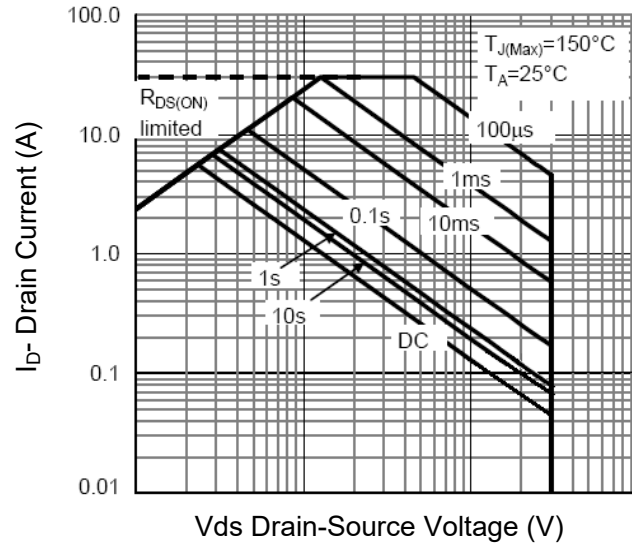


Figure 13 Safe Operation Area

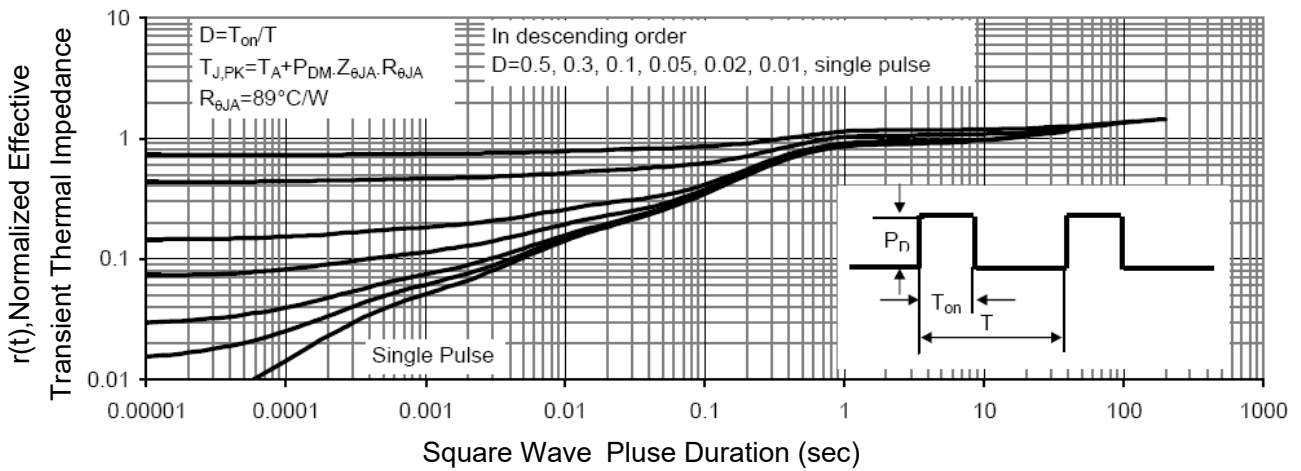
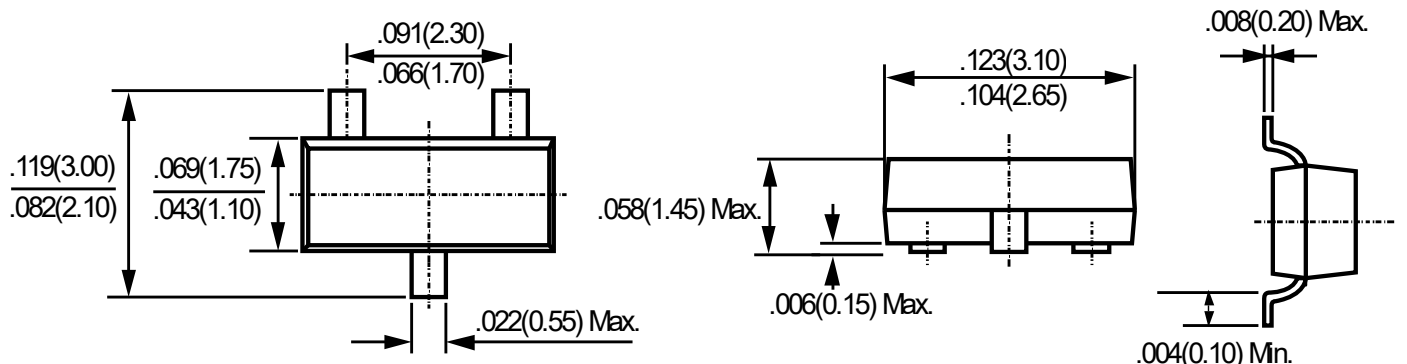


Figure 14 Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions



SOT-23

Dimensions in inches and (millimeters)



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