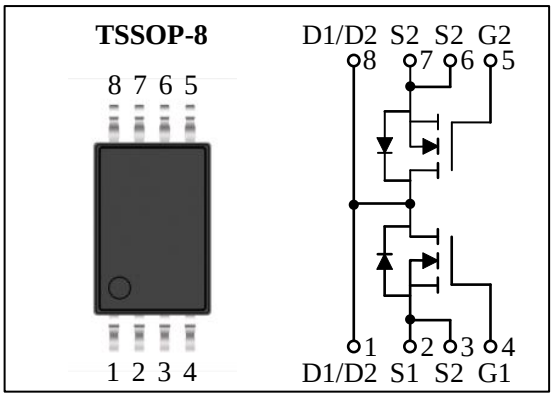
30V Dual N-Channel Enhancement Mode MOSFETs

General Features

- Low $R_{DS(ON)}$
- Low Gate Charge
- Advanced High Cell Density Trench Technology
- RoHS Compliant
- Halogen-free Available

BV_{DSX}	$R_{DS(ON)(Typ.)}$	I_D
30V	8.0mΩ@V_{GS}=10V	10A
	9.5mΩ@V_{GS}=4.5V	
	10.8mΩ@V_{GS}=3.8V	



Applications

- High Efficiency DC/DC Converters
- Synchronous Rectification
- UPS Inverter
- Power Management
- Battery Powered System
- Uni-Directional or Bi-Directional Load Switch

Ordering Information

Part Number	Package	Marking	Remark
AKL30N5P0SD	TSSOP-8	30N5P0SD	Halogen Free

Absolute Maximum Ratings

T_A=25℃ unless otherwise specified

Symbol	Parameter	AKL30N5P0SD	Unit
V_{DSX}	Drain-to-Source Voltage [1]	30	V
V_{DGX}	Drain-to-Gate Voltage [1]	30	V
I_D	Continuous Drain Current	10	A
I_{DM}	Pulsed Drain Current [2]	35	
P_D	Power Dissipation	2	W
V_{GS}	Gate-to-Source Voltage	±20	V
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	℃
T_J & T_{STG}	Operating and Storage Temperature Range	-55 to 150	

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	AKL30N5P0SD	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	℃/W

Electrical Characteristics

OFF Characteristics

T_A =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	30	--	--	V	V_{GS}=0V, I_D=250μA
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	μA	V_{DS}=30V, V_{GS}=0V
I_{GSS}	Gate-to-Source Leakage Current	--	--	100	nA	V_{GS}=20V, V_{DS}=0V
		--	--	-100		V_{GS}=-20V, V_{DS}=0V

ON Characteristics

T_A =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	8.0	12.5	mΩ	V_{GS}=10V, I_D=8A [3]
		--	9.5	13.5	mΩ	V_{GS}=4.5V, I_D=5A [3]
		--	11.5	15	mΩ	V_{GS}=3.8V, I_D=5A [3]
$V_{GS(TH)}$	Gate Threshold Voltage	1.0	--	2.0	V	V_{GD}=0V, I_D=250μA
gfs	Forward Transconductance	--	18	--	S	V_{DS}=5V, I_D=8A

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	1527	--	pF	V_{GS}=0V V_{DS}=15V f=1.0MHz
C_{oss}	Output Capacitance	--	187	--		
C_{rss}	Reverse Transfer Capacitance	--	151	--		
Q_g	Total Gate Charge	--	18.8	--	nC	V_{GS}=10V V_{DS}=15V I_D=10A
Q_{gs}	Gate-to-Source Charge	--	6.0	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	6.6	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	16	--	ns	V_{GS}=10V V_{DD}=15V R_L=2.3Ω R_G=3.3Ω
t_{rise}	Rise Time	--	45	--		
$t_{d(off)}$	Turn-off Delay Time	--	38	--		
t_{fall}	Fall Time	--	14	--		

Source-Drain Diode Characteristics

T_A=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.2	V	I_{SD}=3A, V_{GS}=0V

NOTE:

[1] T_J=+25℃ to +150℃.
[2] Repetitive rating, pulse width limited by maximum junction temperature.
[3] Pulse width≤380μs, duty cycle≤2%.

Typical Characteristics

Figure 1. Typical Output Characteristics

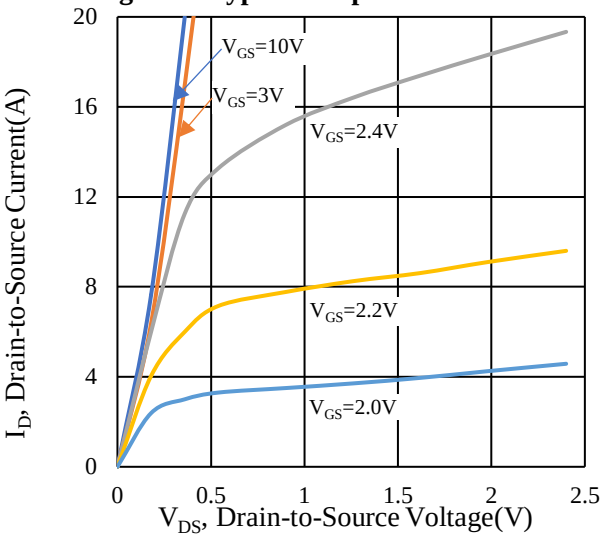


Figure 2. Typical Transfer Characteristics

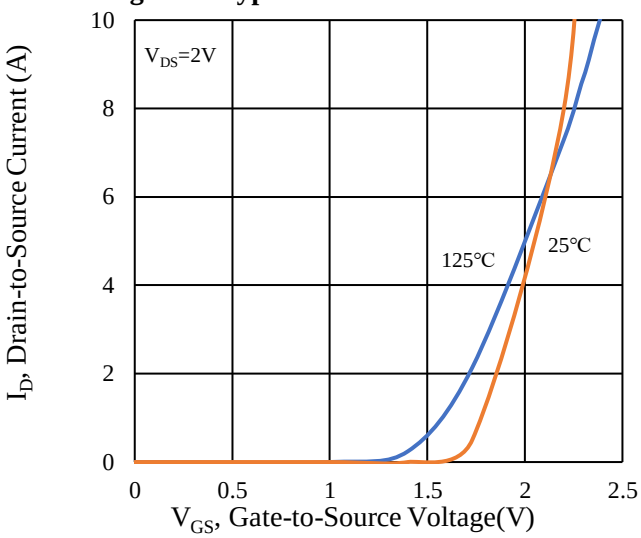


Figure 3. Typical Drain-to-Source On Resistance vs. Junction Temperature

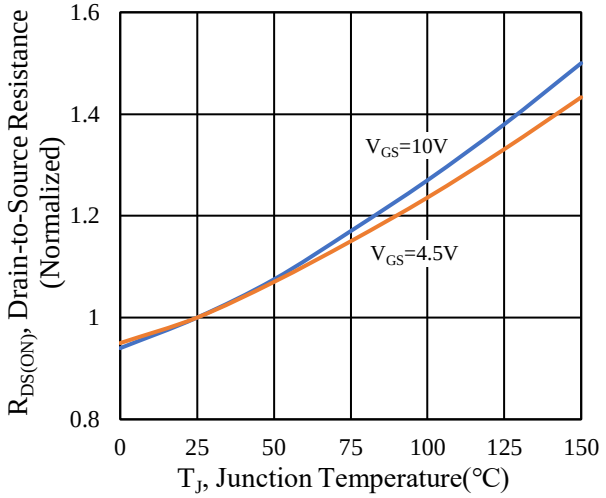


Figure 4. Typical Body Diode Transfer Characteristics

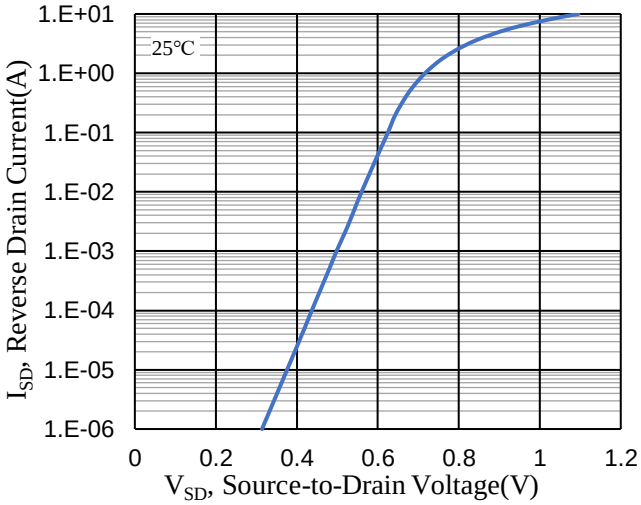


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

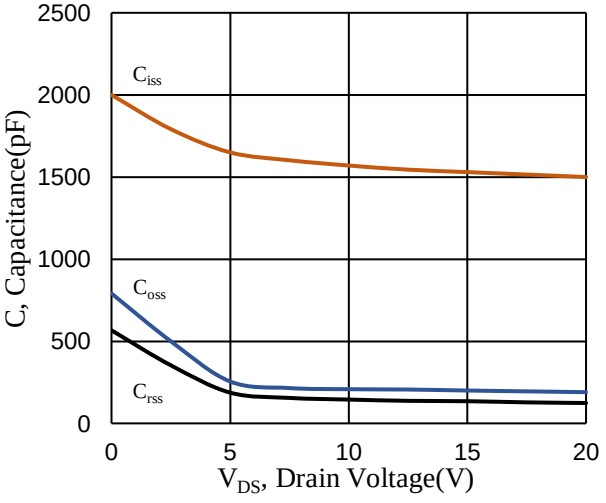


Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage

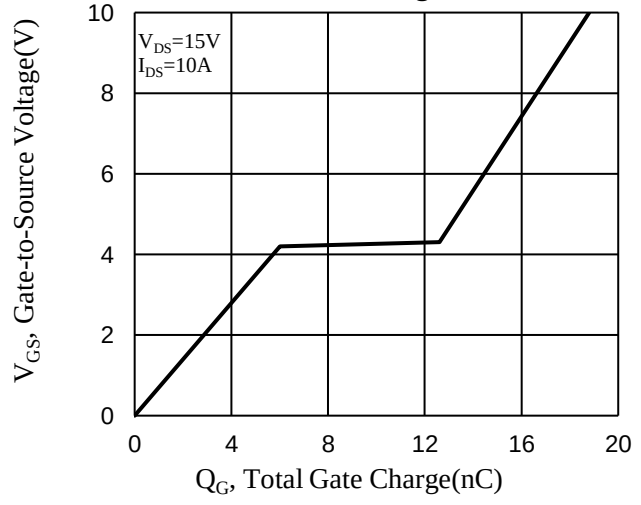


Figure 7a. Unclamped Inductive Test Circuit

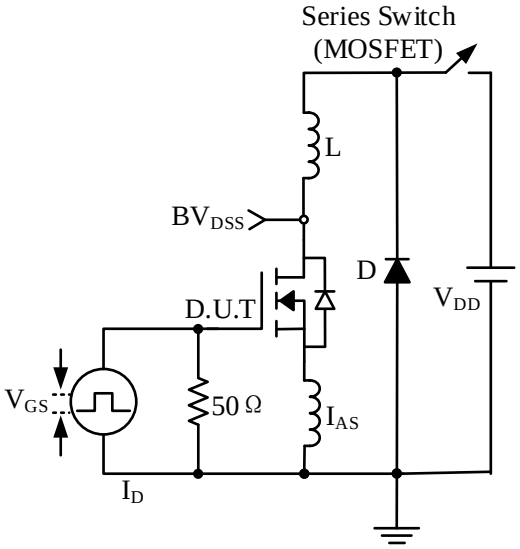


Figure 7b. Unclamped Inductive Waveforms

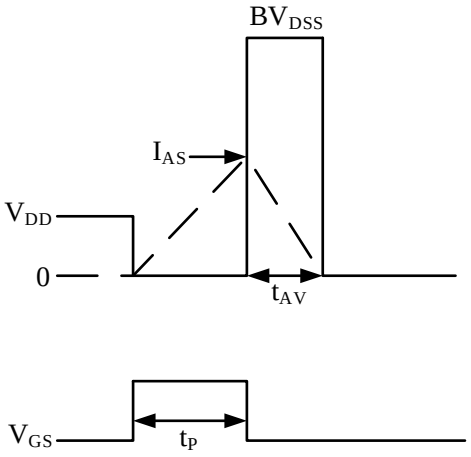


Figure 8a. Gate Charge Test Circuit

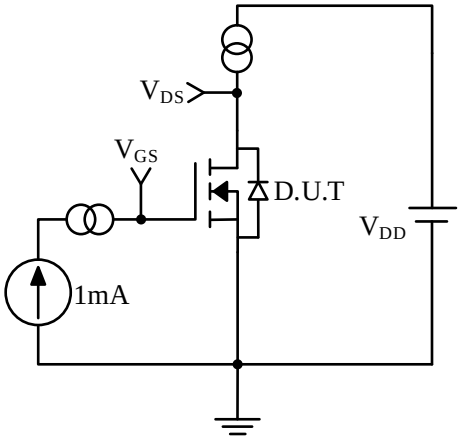


Figure 8b. Gate Charge Waveform

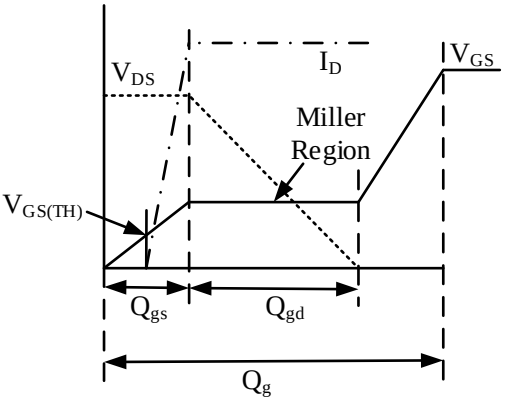


Figure 9a. Switching Time Test Circuit

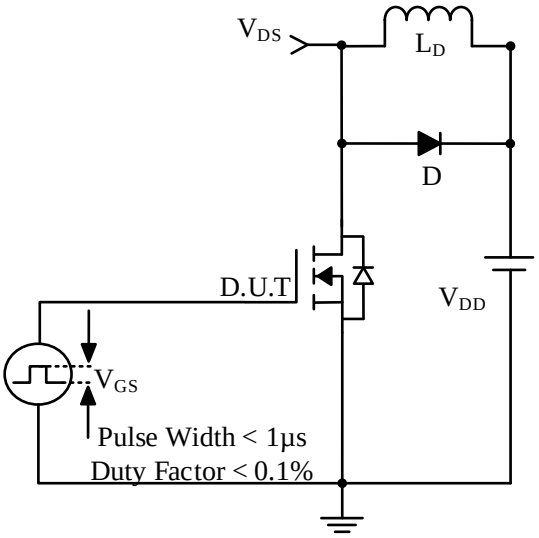
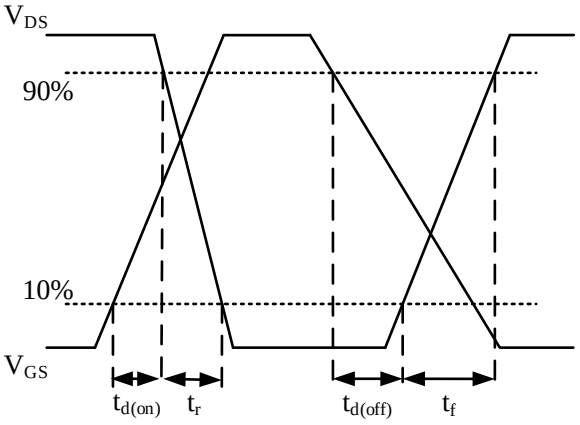
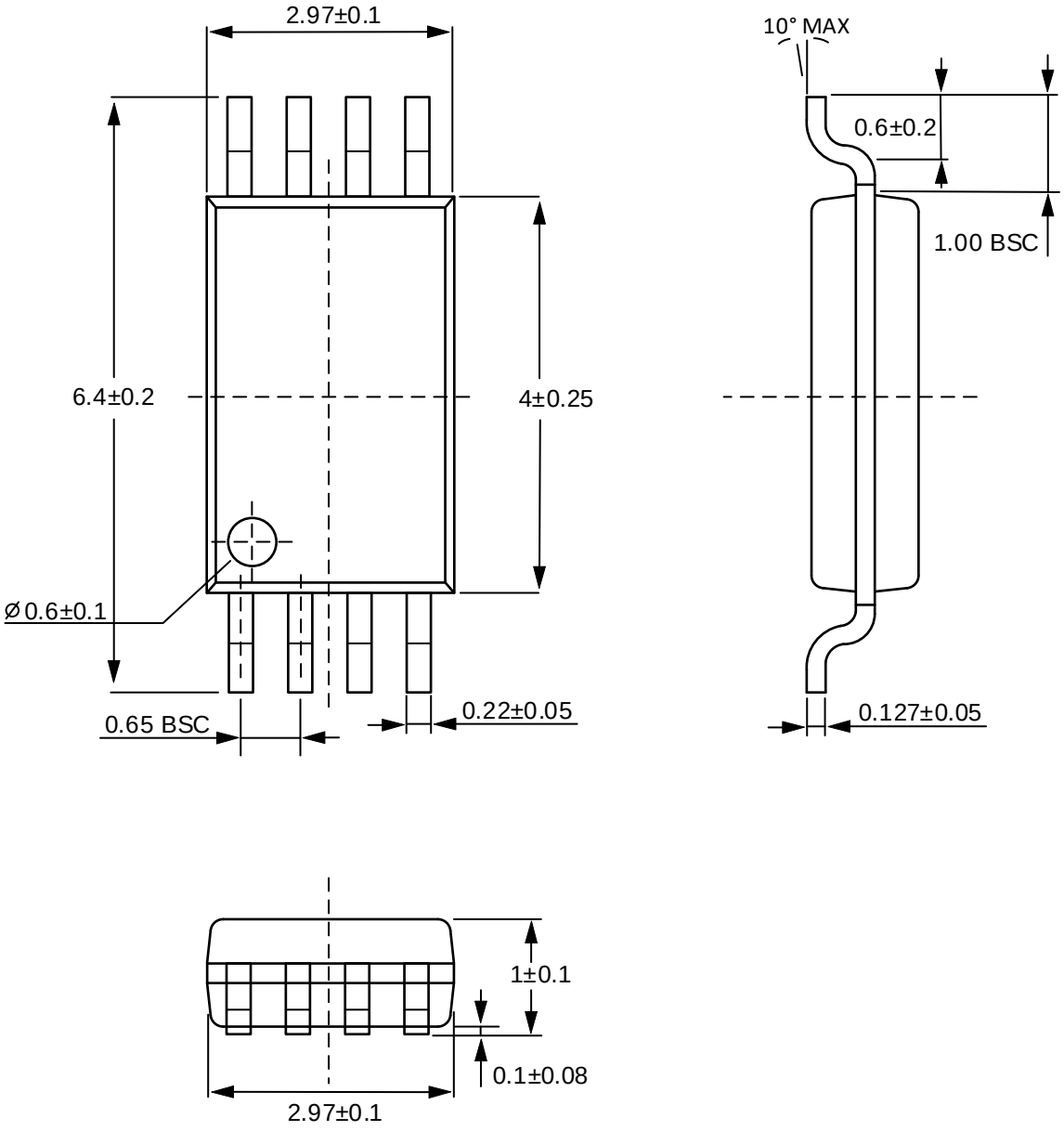


Figure 9. Switching Time Waveforms



Package Dimensions

TSSOP-8



Published by
ARK Microelectronics Co., Ltd.
ADD: 4F, D26, UESTC National Science Park No. 1 Shuangxing Avenue, Chengdu, Sichuan.

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