

100V 9.6mohm N-channel SGT MOSFET

AKG10N096SL

Description:

This N channel SGT MOSFET has been designed to very low on-state resistance and superior E_{AS} performance, especially for BMS and Motor driving applications.

Features:

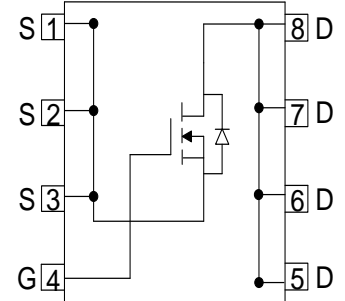
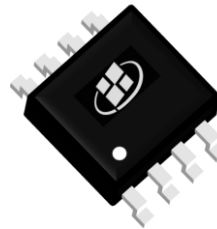
- Low FOM $R_{DS(ON)} \times Q_G$
- Ultra-low on-resistance
- RoHS compliant ^(Note 1)
- Halogen-free ^(Note 1)

Applications:

- Battery Management System
- Motor Drivers
- DC-DC Converter

Key Performance Parameters:

Parameter	Value	Unit
V_{DS}	100	V
$R_{DS(ON), max} @ V_{GS} = 10V$	9.6	m Ω
I_D	11	A



Ordering Information:

Ordering Code	Package Type	Marking Code	Form	Packing
AKG10N096SL	SOP-8	G10N096SL	Tape Reel	4000PCS

Notes:

1. Contact ALKAIDSEMI sales for detail information

Maximum Ratings (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Value	Units
V _{DS}	Drain-Source Voltage	100	V
I _D	Drain Current - Continuous (T _C = 25°C) ^(Note 1)	11	A
	Drain Current - Continuous (T _C = 100°C)	7	A
I _{DM}	Drain Current - Pulsed ^(Note 2)	33	A
V _{GS}	Gate-Source Voltage	± 20	V
E _{AS}	Single Pulsed Avalanche Energy ^(Note 3)	30	mJ
P _D	Power Dissipation (T _C = 25°C)	2	W
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +150	°C

Thermal Characteristics

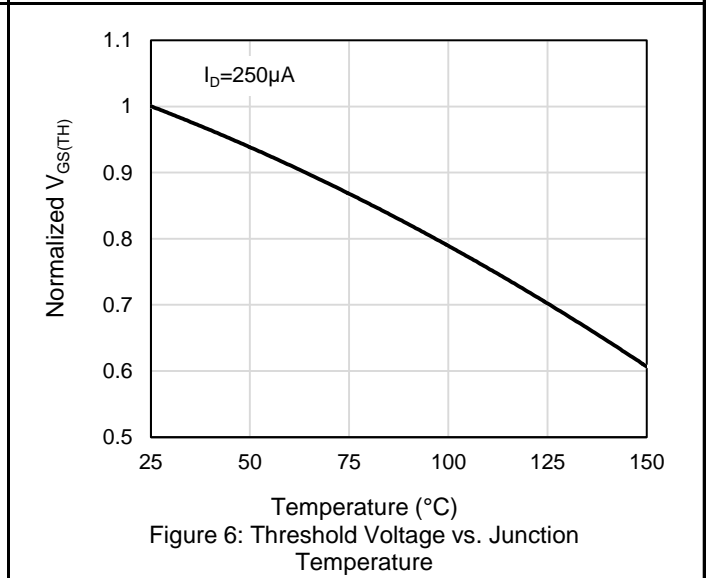
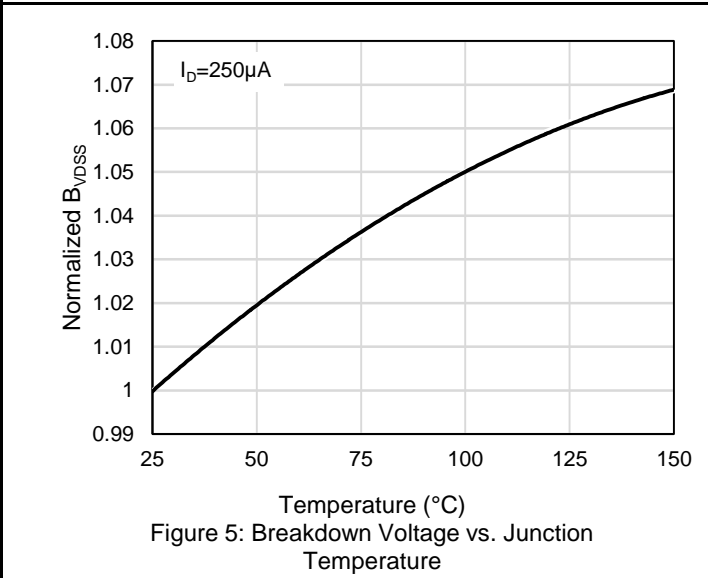
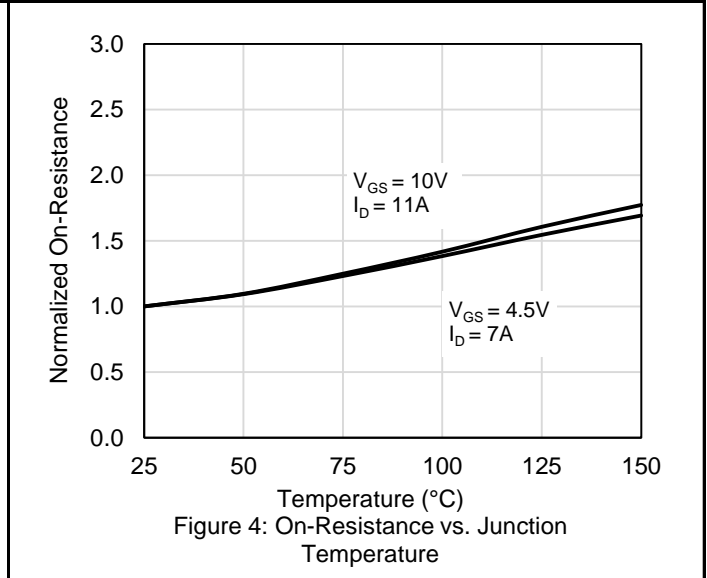
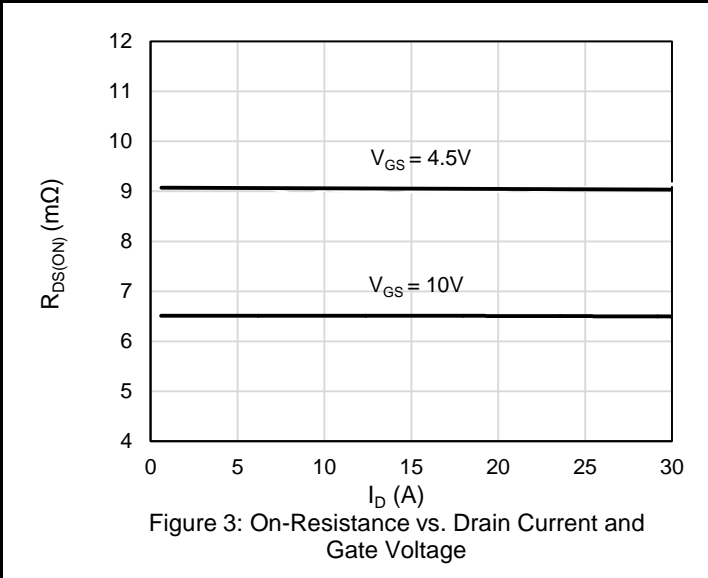
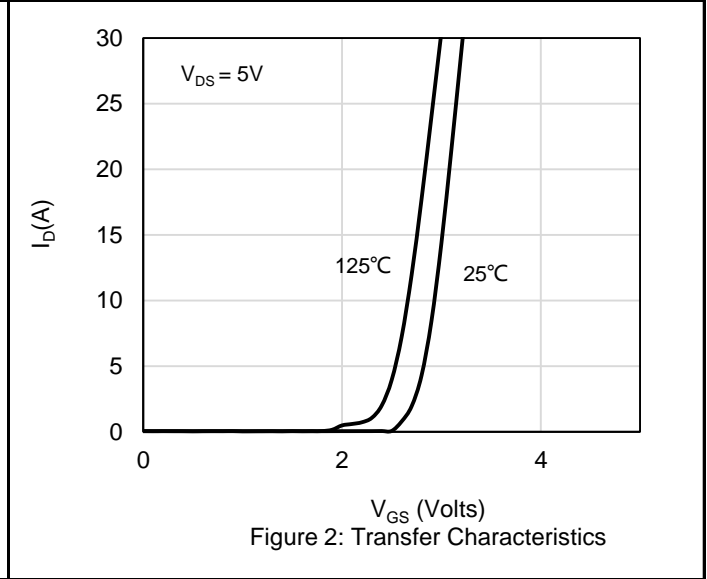
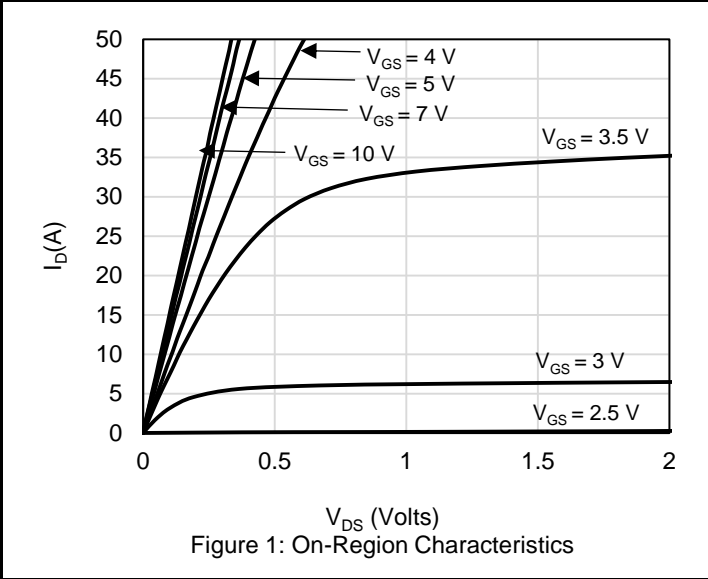
Symbol	Parameter	Value	Units
R _{θJC}	Thermal Resistance, Junction-to-Case, Steady-State	1.8	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient, Steady State ^(Note 4)	60	°C/W

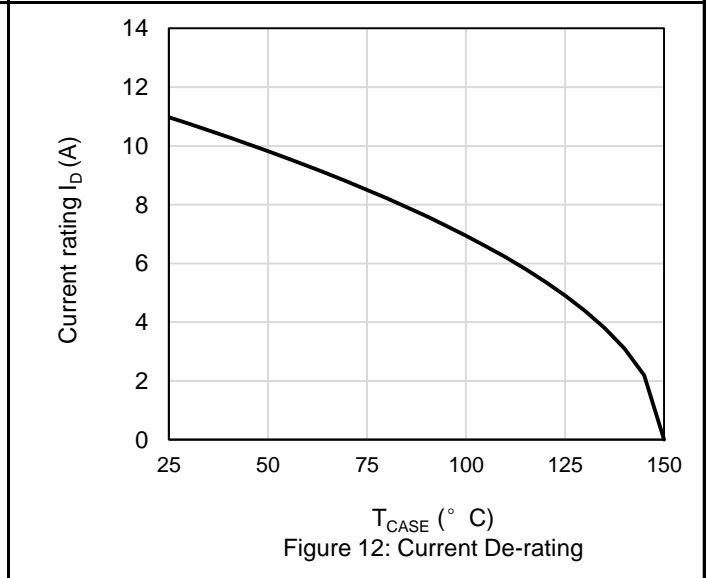
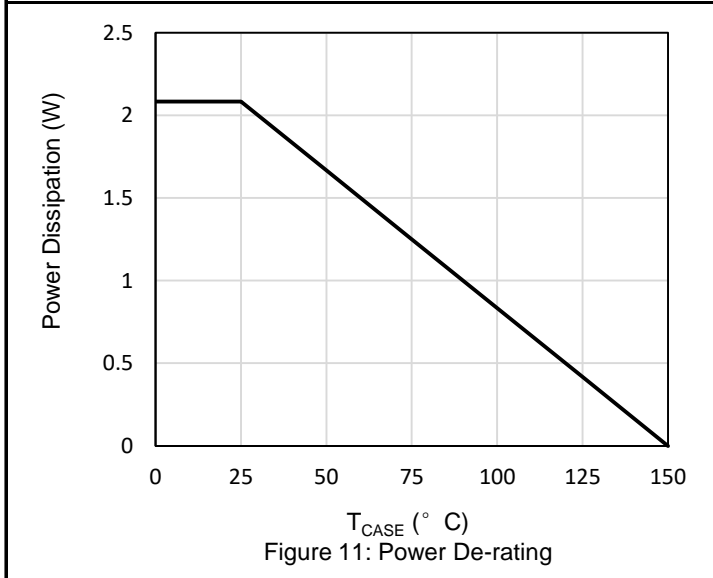
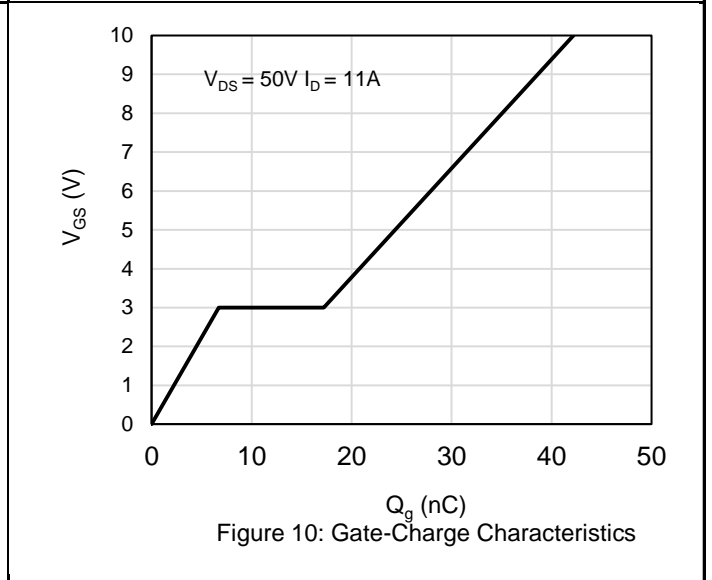
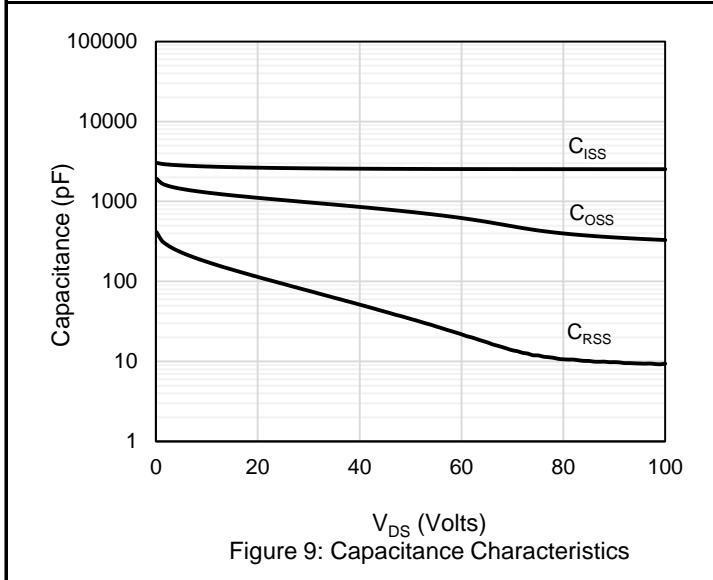
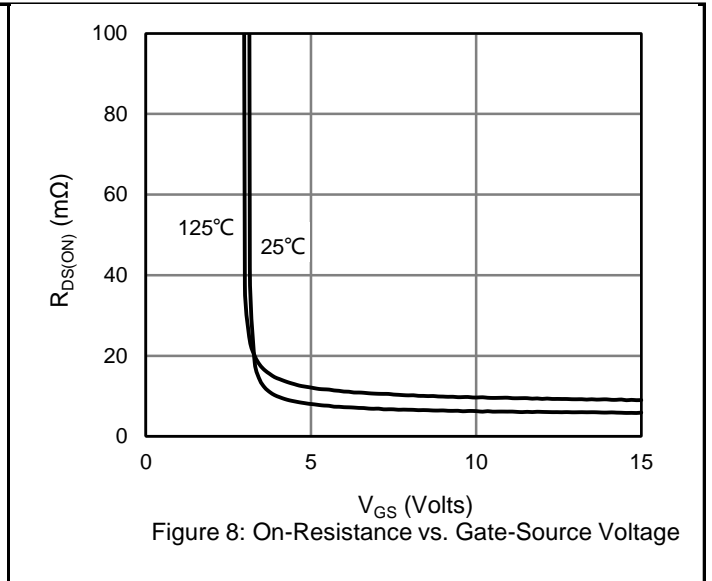
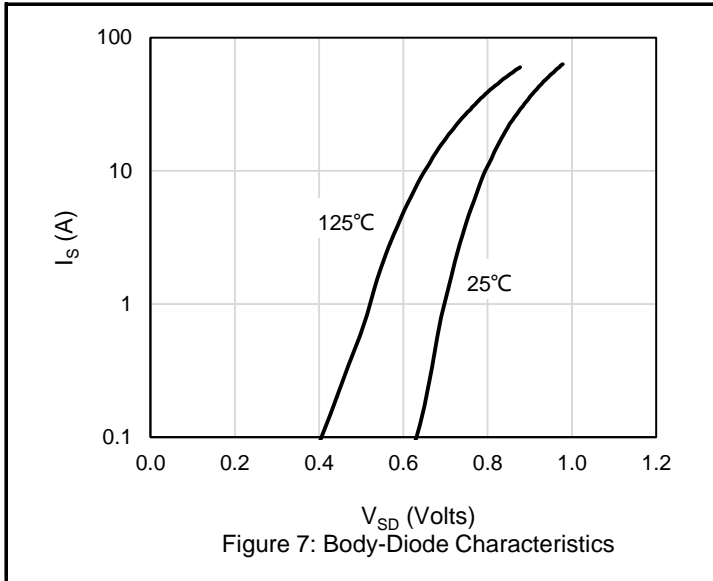
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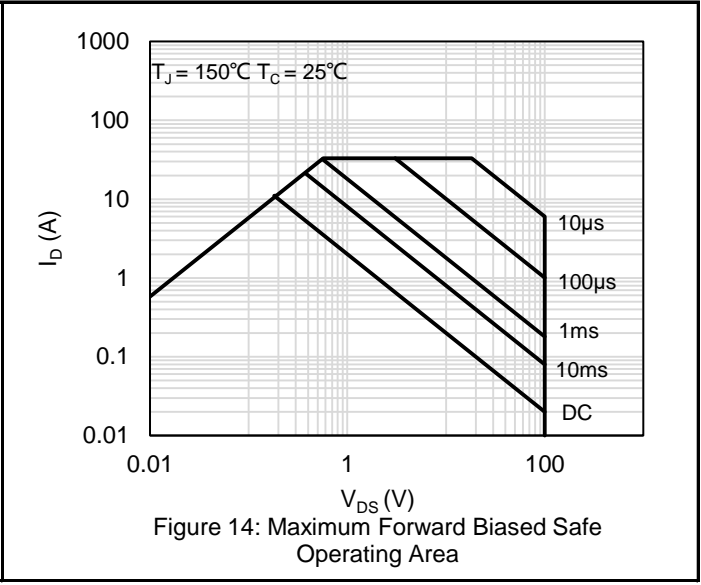
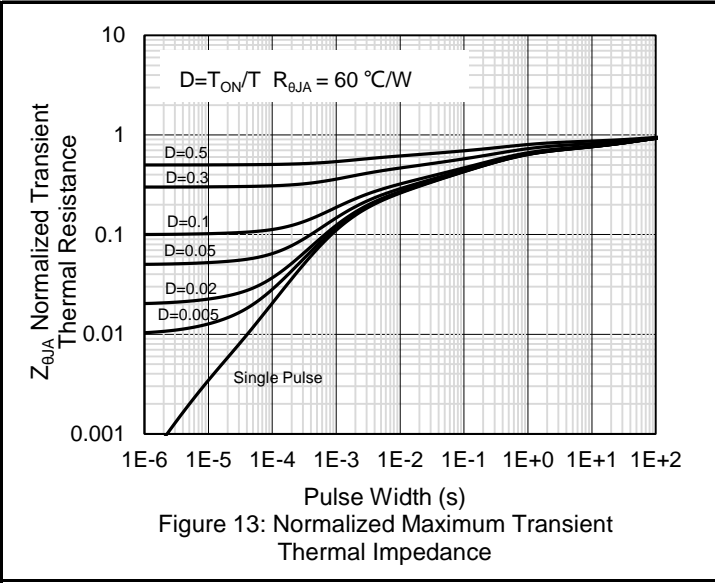
1. Continuous current base on R_{θJA}, garauntee by design.
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. L = 0.5 mH, V_{DD} = 50V, I_{AS} = 11 A, R_G = 50 Ω, Starting T_J = 25 °C
4. Mount on minimum PCB layout

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V},$			1	μA
I_{GSS}	Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$			± 100	nA
$V_{GS(TH)}$	Gate Threshold voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.3	1.9	2.5	V
$R_{DS(ON)}$	Drain-Source on-state resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$		6.5	9.6	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$		8.9	13	m Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V},$ $F = 1\text{ MHz}$		2550		pF
C_{OSS}	Output Capacitance			740		pF
C_{RSS}	Reverse Transfer Capacitance			34		pF
R_G	Gate Resistance	$F = 1\text{ MHz}$		3.1		Ω
Switching Characteristics						
$T_{D(ON)}$	Turn On Delay Time	$V_{DD} = 50\text{ V}, R_L = 4.1\ \Omega,$ $V_{GS} = 10\text{ V}, R_G = 6\ \Omega$		14		nS
T_R	Rise Time			29.5		nS
$T_{D(OFF)}$	Turn Off Delay Time			50		nS
T_F	Fall Time			41.5		nS
Q_G	Total Gate Charge	$V_{DD} = 50\text{ V}, I_D = 20\text{ A},$ $V_{GS} = 10\text{ V}$		42.2		nC
Q_{GS}	Gate-Source Charge			6.69		nC
Q_{GD}	Gate-Drain Charge			10.5		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Body-Diode Forward Current				11	A
I_{SM}	Maximum Pulsed Body-Diode Forward Current ^(NOTE 1)				33	A
V_{SD}	Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 1\text{ A}$		0.71		V
T_{RR}	Reverse recovery time	$V_{DD} = 50\text{ V}, I_D = 12\text{ A},$ $di/dt = 100\text{ A}/\mu\text{S}$		47		nS
Q_{RR}	Reverse recovery charge			63		nC
I_{RRM}	Peak Reverse Recovery Current			2.2		A

Electrical Characteristics Diagrams

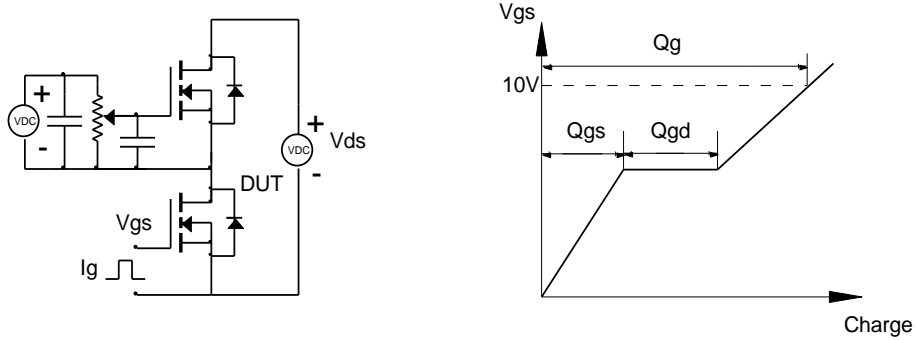




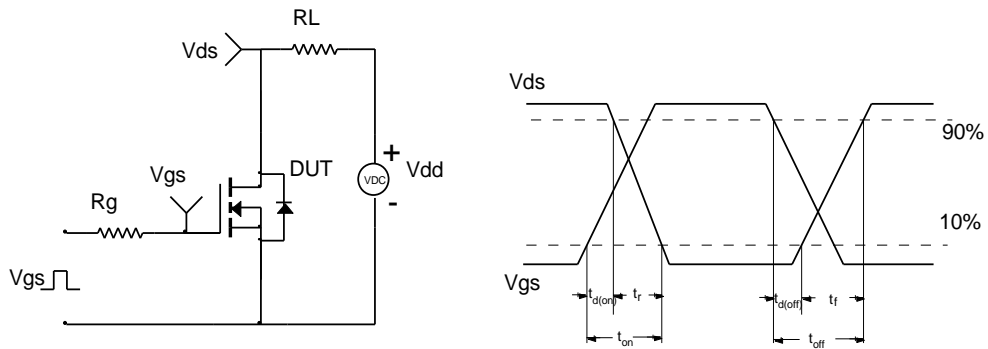


Test Circuit and Waveform

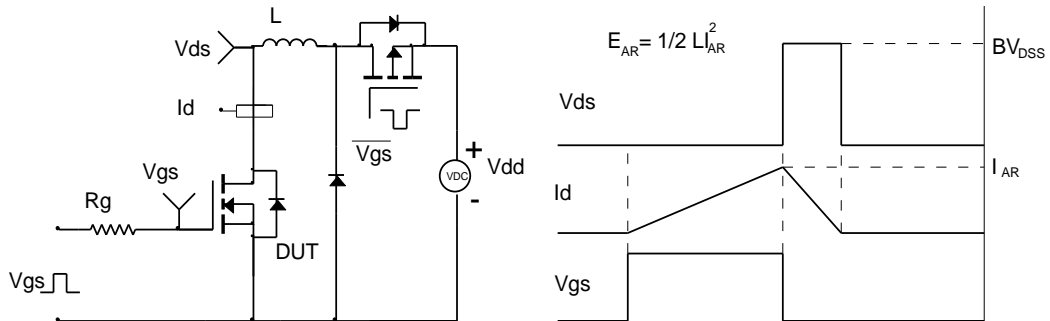
Gate Charge Test Circuit & Waveform



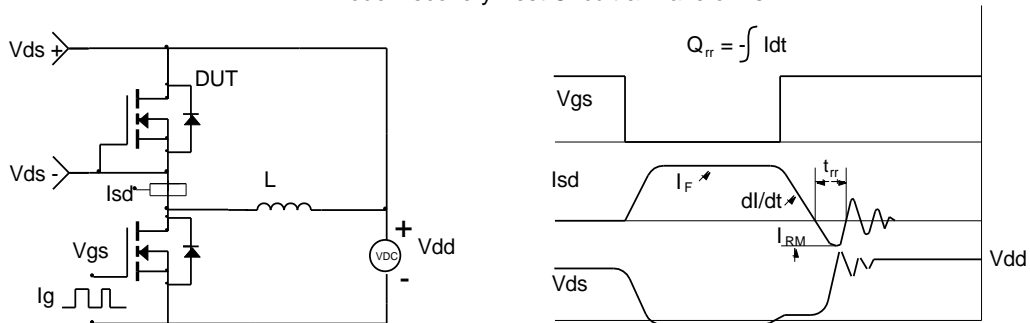
Resistive Switching Test Circuit & Waveforms



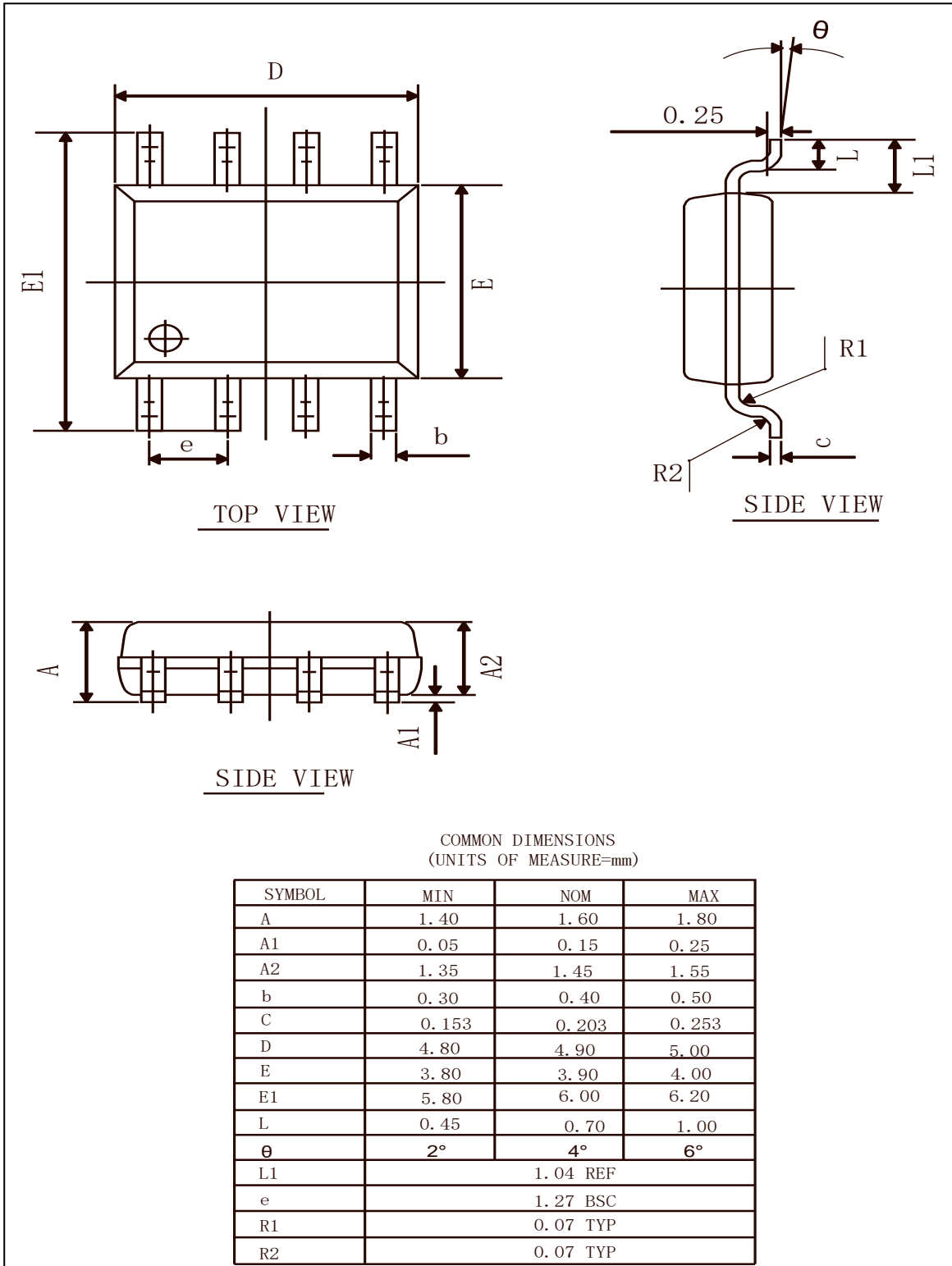
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



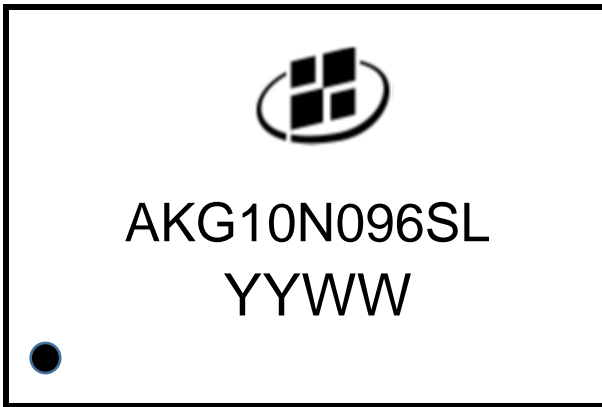
Diode Recovery Test Circuit & Waveforms



Package Outlines

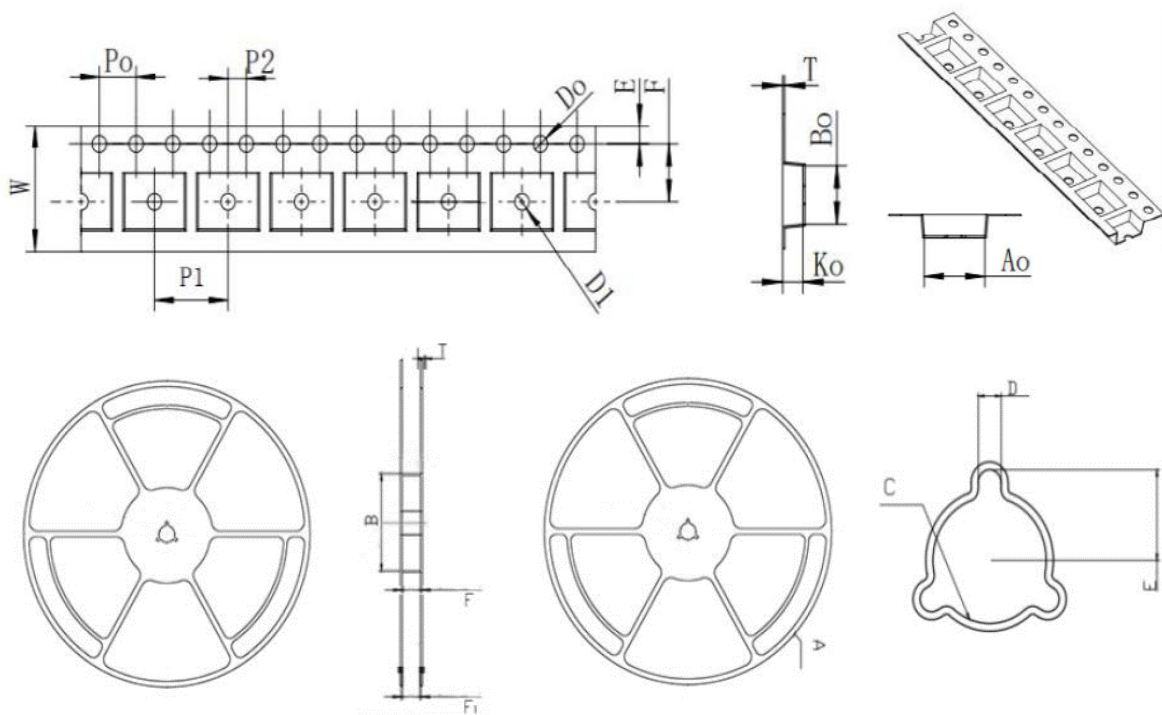


Marking Information



Note:
 AKG10N096SL = Product Name Code
 YYWW = Date code
 Contact ALKAIDSEMI sales for detail information

Tape and Reel information



DIMENSIONS (Unit:mm)											
Reel	A	B	C	D	E	F	F1	T			
	330	100	13.2	3	10	12.4	12.8	2.2			
Tape	P0	P1	W	A0	B0	K0	D0	D1	E	F	T
	4	8	12	6.5	5.3	2.05	1.5	1.5	1.75	5.5	0.25

Revision History

Revision	Release Date	Remark
Rev.1.1	2023/7/11	

Disclaimer

The information given in this document describes the independent performance of the product, but similar performance is not guaranteed under other working conditions, and cannot be guaranteed when installed with other products or equipment. To achieve the required performance of the product in actual scenarios, the customer should conduct a complete application test to assess the functionality of the product.

Alkaidsemi assumes no responsibility for equipment failures result from using products at values that exceed the ratings, operating conditions, or other parameters listed in the product specifications.

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