

# 150V 7mohm N-channel SGT MOSFET

## AKG15N070PM

### 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:

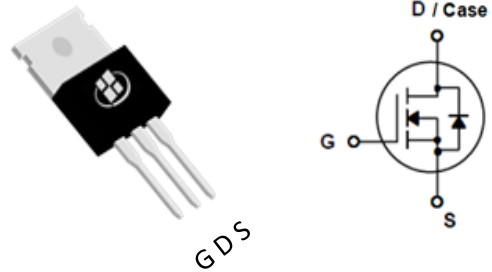
- Low FOM  $R_{DS(ON)} \times Q_G$
- Ultra-low on-resistance
- RoHS compliant <sup>(Note 1)</sup>
- Halogen-free <sup>(Note 1)</sup>

### Applications:

- Battery management
- Solenoid and Motor Drivers
- DC-DC/DC-AC

### Key Performance Parameters:

Parameter	Value	Unit
$V_{DS}$	150	V
$R_{DS(ON), max} @ V_{GS} = 10V$	7	m $\Omega$
$I_D$	110	A



### Ordering Information:

Ordering Code	Package Type	Marking Code	Form	Packing
AKG15N070PM	TO-220	G15N070PM	Tube	1000PCS

### Notes:

1. Contact ALKAIDSEMI sales for detail information

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

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-Source Voltage	150	V
$I_D$	Drain Current - Continuous ( $T_C = 25^\circ\text{C}$ ) <sup>(Note 1)</sup>	110	A
	Drain Current - Continuous ( $T_C = 100^\circ\text{C}$ )	70	A
$I_{DM}$	Drain Current - Pulsed <sup>(Note 2)</sup>	440	A
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulsed Avalanche Energy <sup>(Note 3)</sup>	625	mJ
$P_D$	Power Dissipation ( $T_C = 25^\circ\text{C}$ )	192	W
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

## Thermal Characteristics

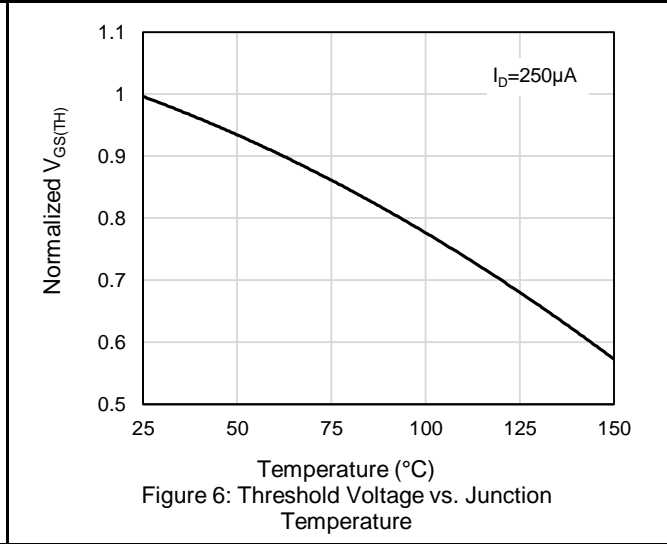
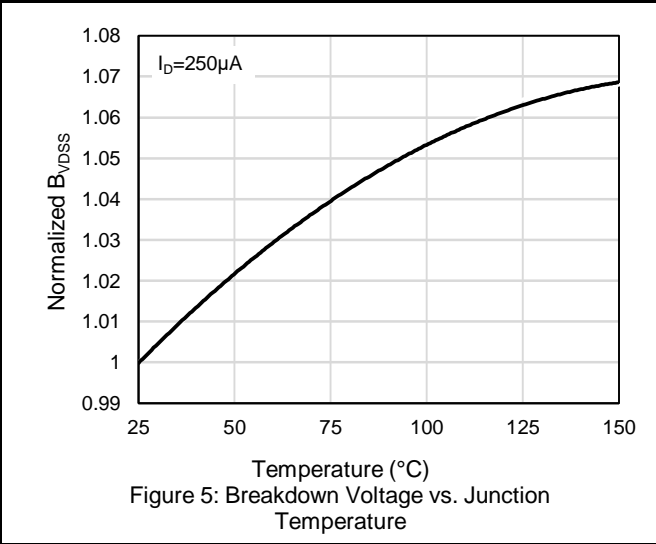
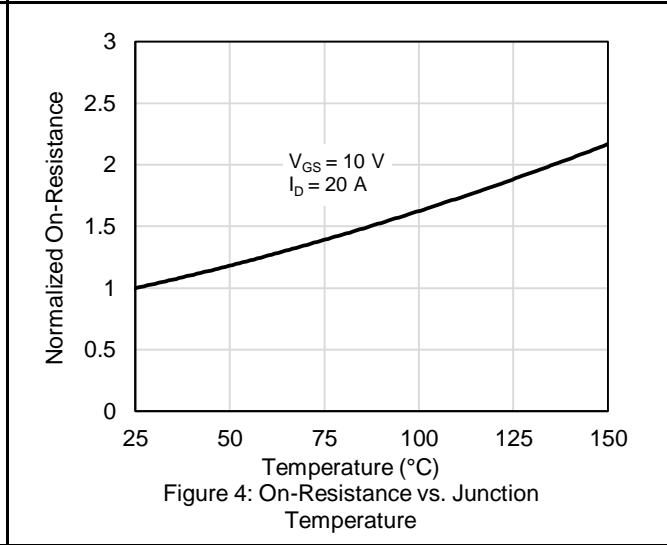
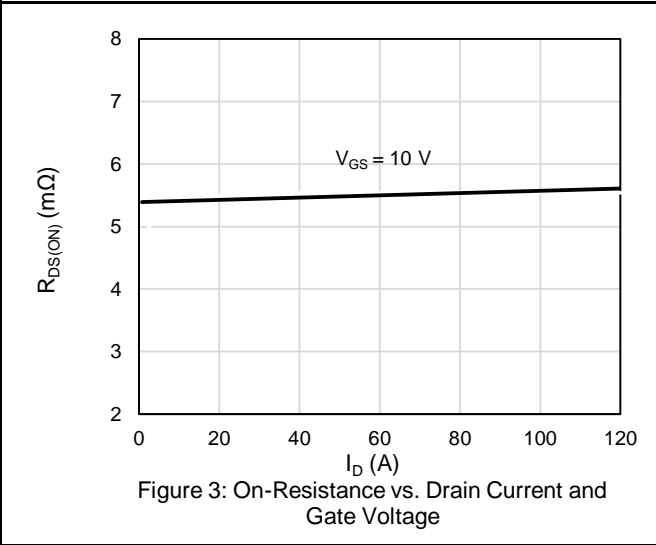
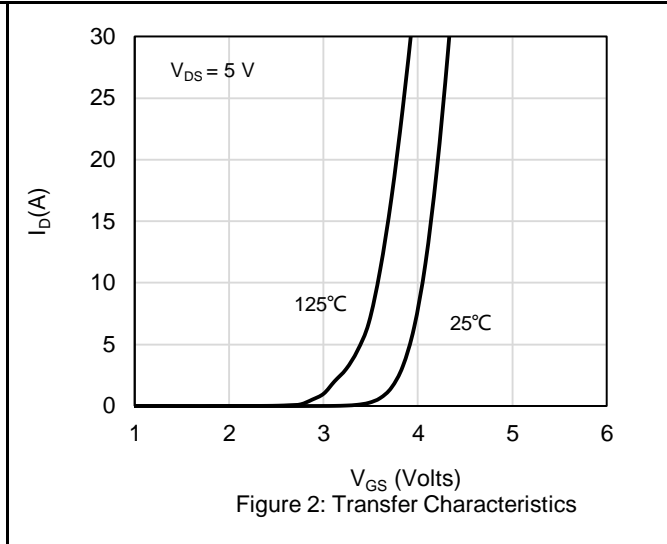
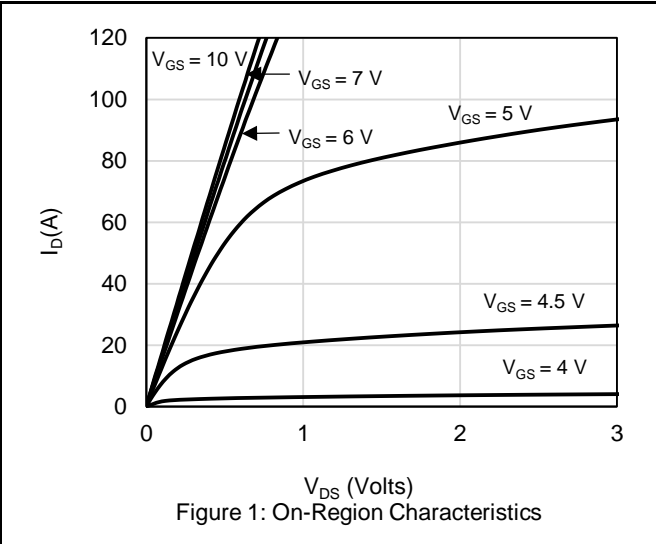
Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Steady-State	0.65	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient, Steady State <sup>(Note 4)</sup>	50	$^\circ\text{C}/\text{W}$

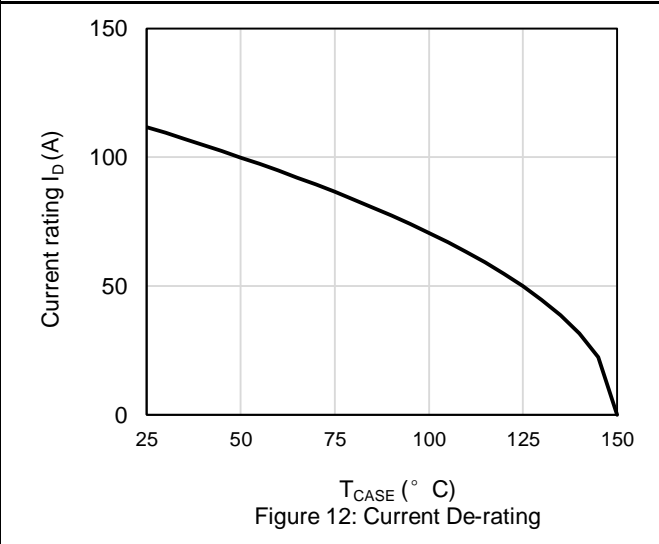
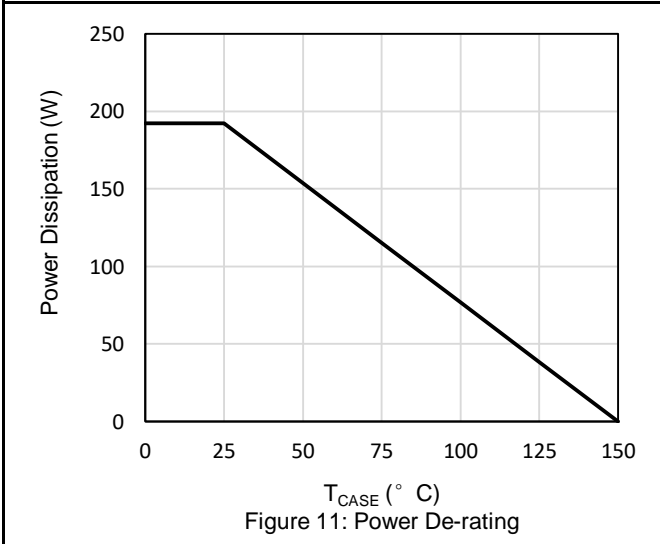
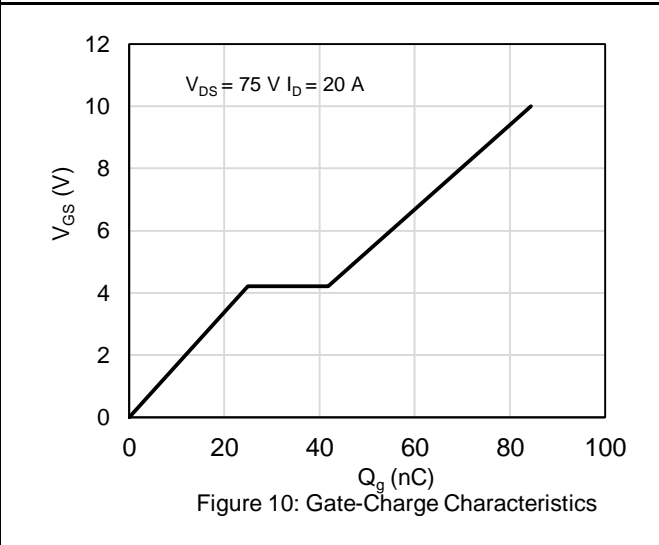
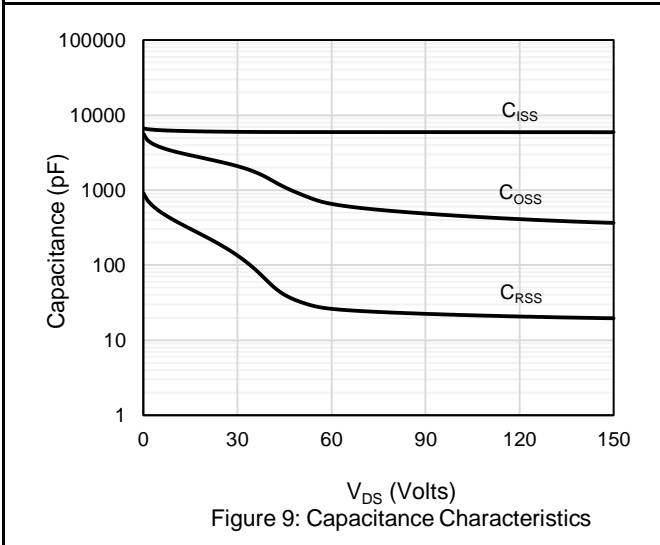
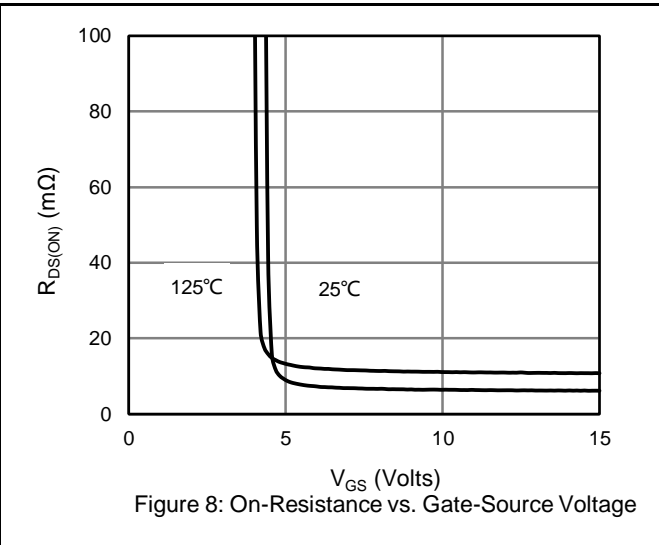
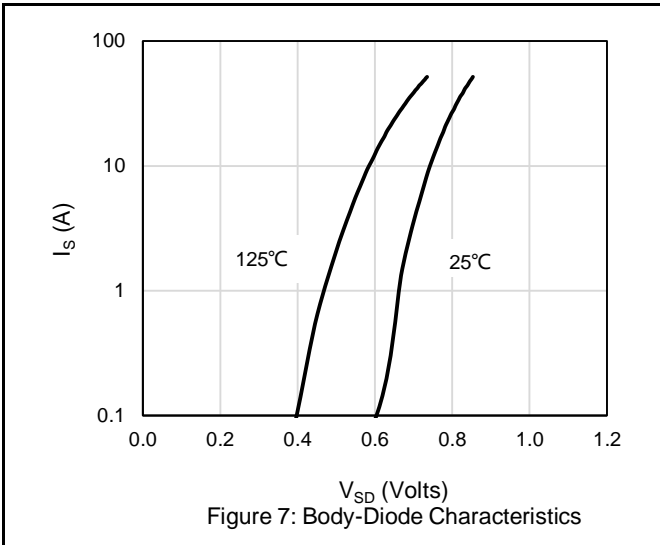
### Notes:

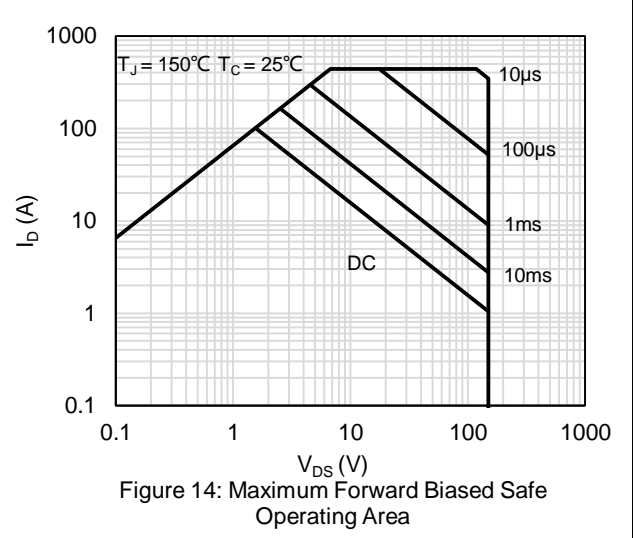
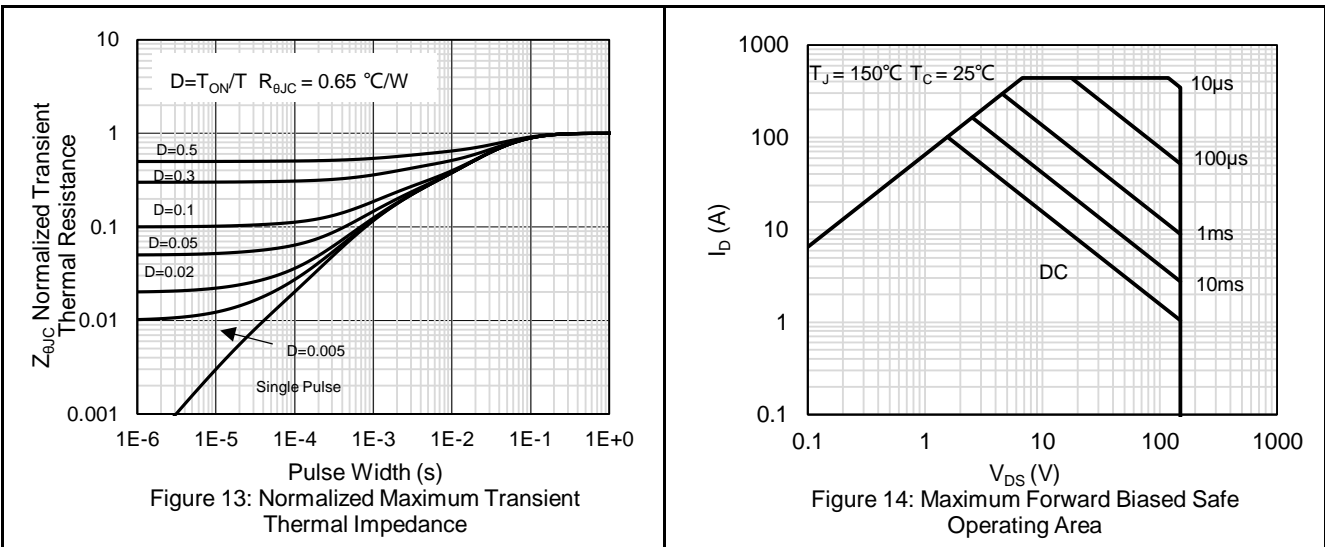
1. The max drain current rating is package limited
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3.  $L = 0.5 \text{ mH}$ ,  $V_{DD} = 75\text{V}$ ,  $I_{AS} = 50 \text{ A}$ ,  $R_G = 25 \Omega$ , Starting  $T_J = 25 \text{ }^\circ\text{C}$
4. Mount on minimum PCB layout

<b>Electrical Characteristics</b> ( $T_J = 25^\circ\text{C}$ unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	150			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 150\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
$I_{GSS}$	Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$			$\pm 100$	nA
$V_{GS(TH)}$	Gate Threshold voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2	3	4	V
$R_{DS(ON)}$	Drain-Source on-state resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$		5.5	7	m $\Omega$
<b>Dynamic Characteristics</b>						
$C_{ISS}$	Input Capacitance	$V_{DS} = 75\text{ V}, V_{GS} = 0\text{ V},$ $F = 1\text{ MHz}$		5929		pF
$C_{OSS}$	Output Capacitance			546		pF
$C_{RSS}$	Reverse Transfer Capacitance			23		pF
$R_G$	Gate Resistance	$F = 1\text{ MHz}$		2.2		$\Omega$
<b>Switching Characteristics</b>						
$T_{D(ON)}$	Turn On Delay Time	$V_{DD} = 75\text{ V}, R_L = 3.75\ \Omega,$ $V_{GS} = 10\text{ V}, R_G = 6\ \Omega$		32		nS
$T_R$	Rise Time			49		nS
$T_{D(OFF)}$	Turn Off Delay Time			80		nS
$T_F$	Fall Time			46		nS
$Q_G$	Total Gate Charge	$V_{DD} = 75\text{ V}, I_D = 20\text{ A},$ $V_{GS} = 10\text{ V}$		84.3		nC
$Q_{GS}$	Gate-Source Charge			24.8		nC
$Q_{GD}$	Gate-Drain Charge			16.9		nC
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Body-Diode Forward Current				110	A
$I_{SM}$	Maximum Pulsed Body-Diode Forward Current <sup>(NOTE 1)</sup>				440	A
$V_{SD}$	Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 1\text{ A}$		0.6	1	V
$T_{RR}$	Reverse recovery time	$V_{DD} = 75\text{ V}, I_D = 15\text{ A},$ $di/dt = 100\text{ A}/\mu\text{S}$		92		nS
$Q_{RR}$	Reverse recovery charge			364		nC
$I_{RRM}$	Peak Reverse Recovery Current			6.6		A

# Electrical Characteristics Diagrams

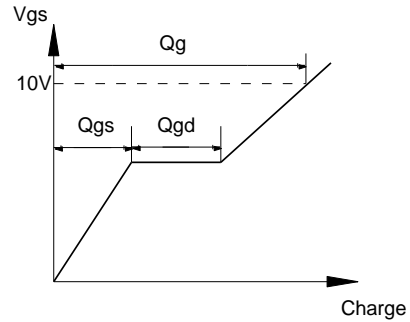
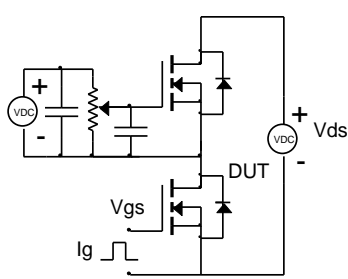




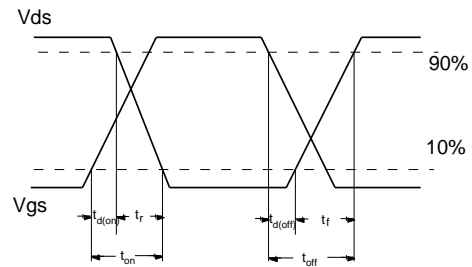
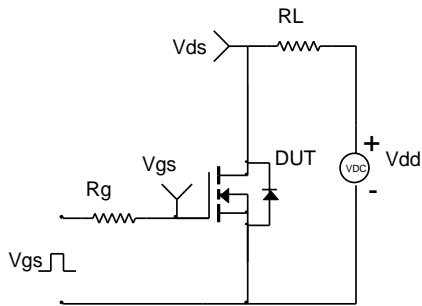


# Test Circuit and Waveform

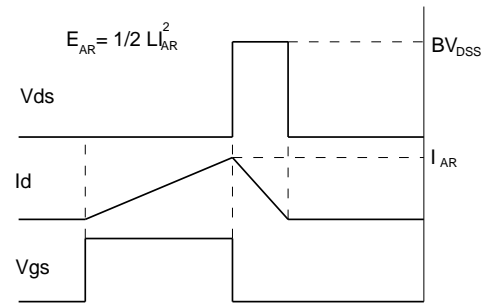
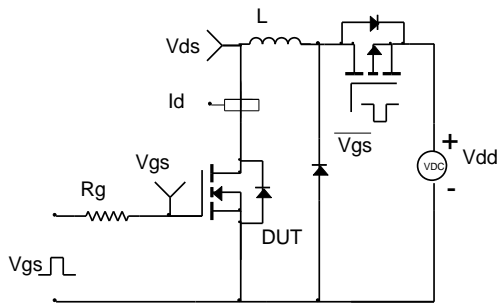
Gate Charge Test Circuit & Waveform



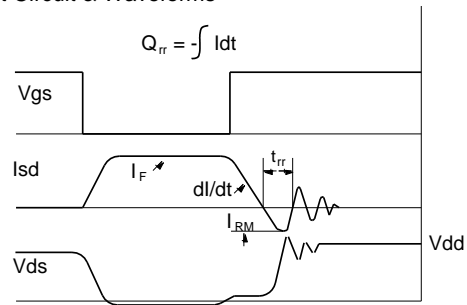
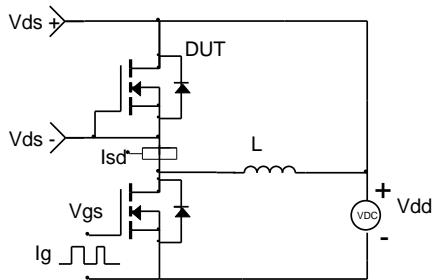
Resistive Switching Test Circuit & Waveforms



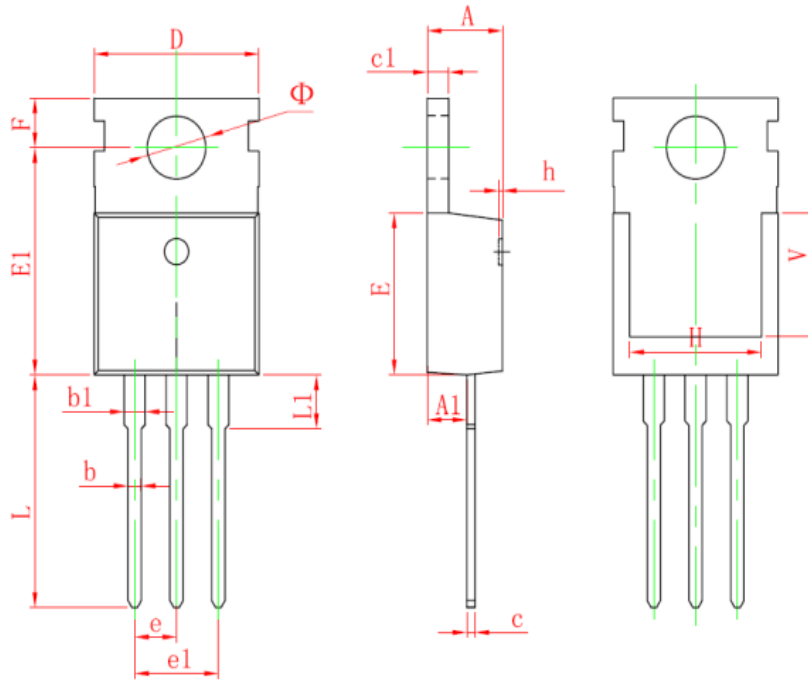
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



## Package Outlines



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150



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## Marking Information



Note:

G15N070PM = Product Name Code

XXXXXXX = Date code

Contact ALKAIDSEMI sales for detail information

## Tape & Reel Information

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## Revision History

Revision	Release Date	Remark
Rev.1.0	2022/7/7	Initial Release

## 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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