

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:

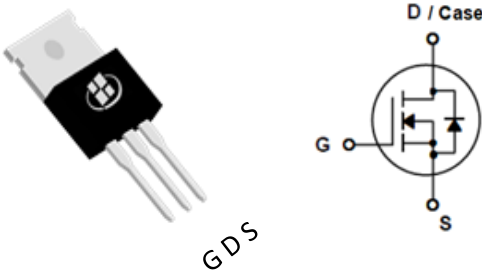
- Low FOM $R_{DS(ON)} \times Q_G$
- Ultra-low on-resistance
- RoHS compliant ^(Note 1)
- Halogen-free ^(Note 1)

Applications:

- Battery management
- Solenoid and Motor Drivers

Key Performance Parameters:

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



Ordering Information:

Ordering Code	Package Type	Marking Code	Form	Packing
AKG15N070PM	TO-220	G15N070PM	Tube	See the detail package information

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 ($T_C = 25^\circ\text{C}$) ^(Note 1)	110	A
	Drain Current - Continuous ($T_C = 100^\circ\text{C}$)	70	A
I_{DM}	Drain Current - Pulsed ^(Note 2)	440	A
V_{GS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy ^(Note 3)	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	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient, Steady State ^(Note 4)	50	$^\circ\text{C/W}$

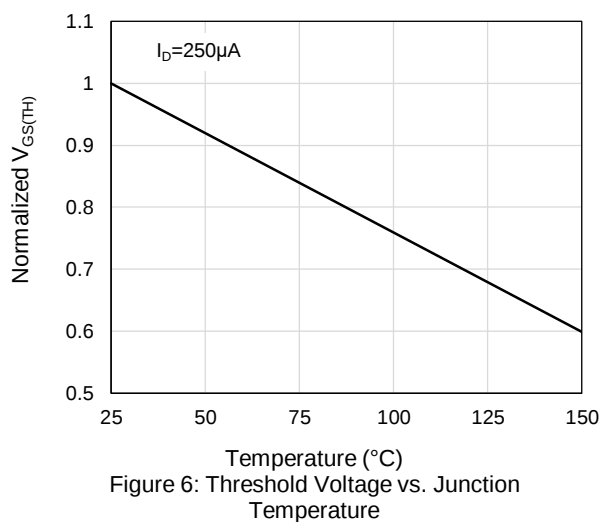
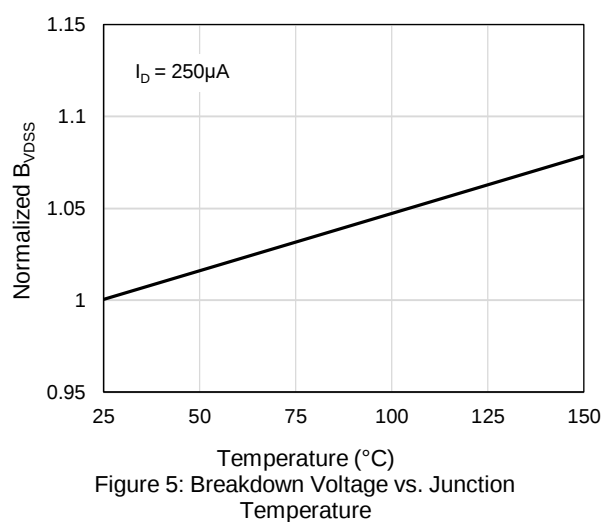
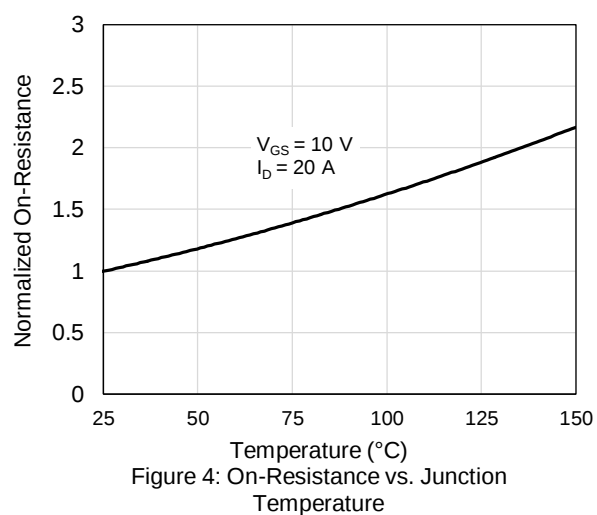
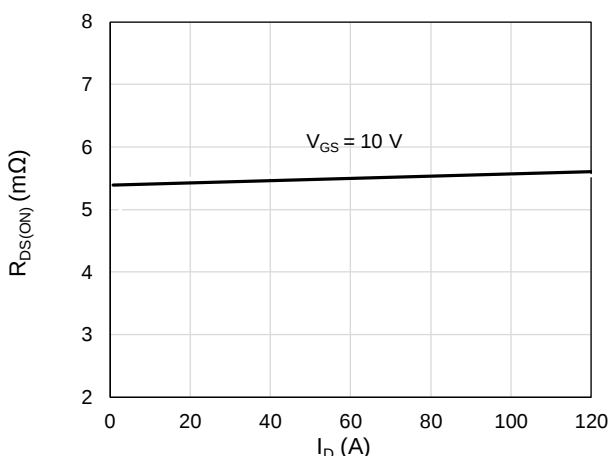
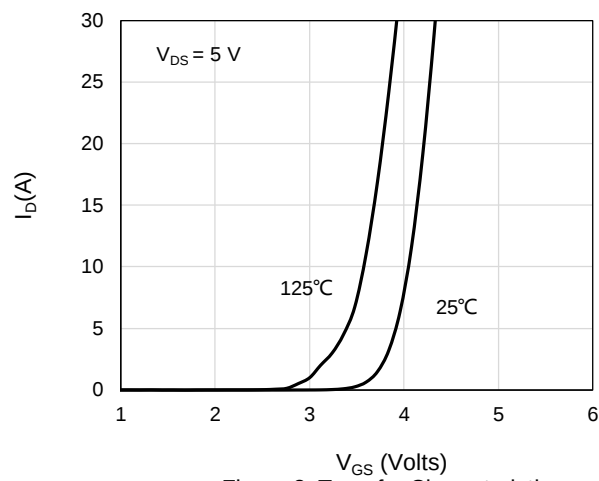
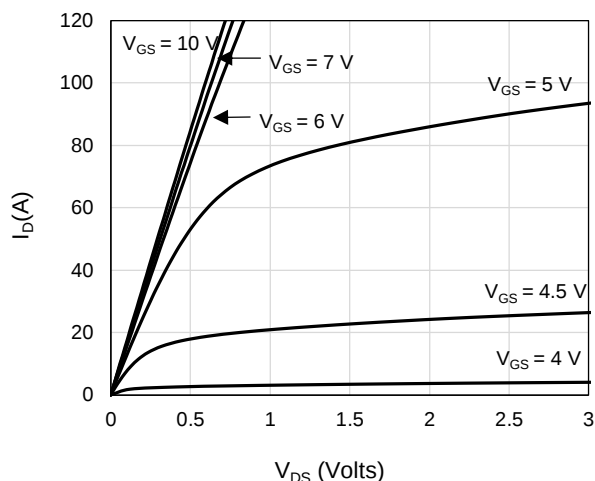
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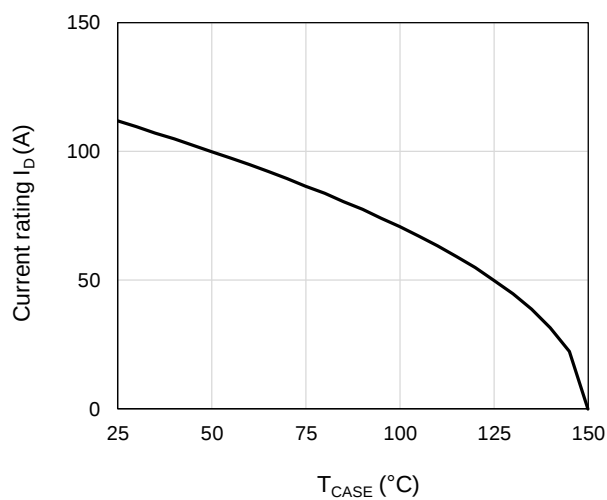
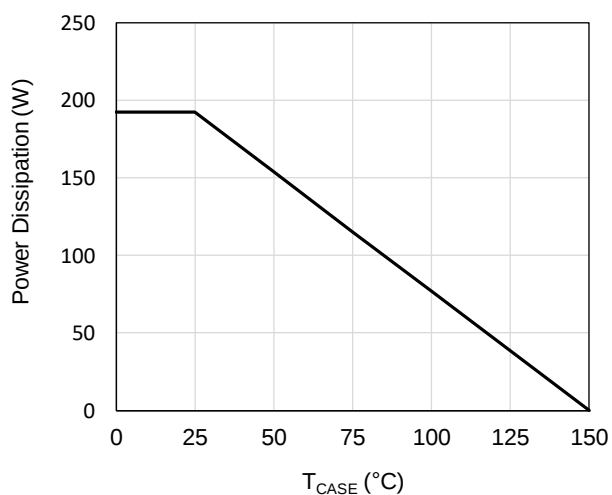
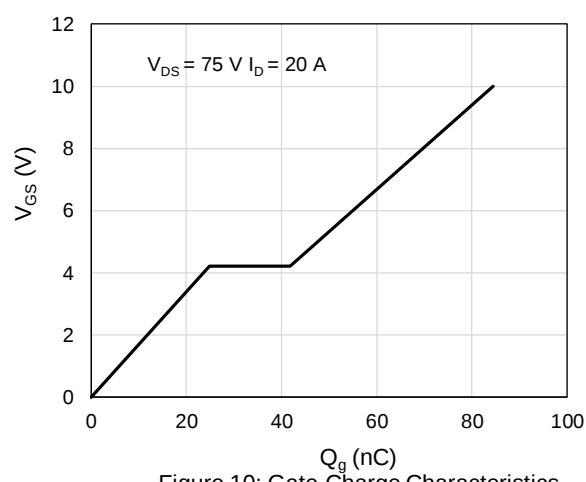
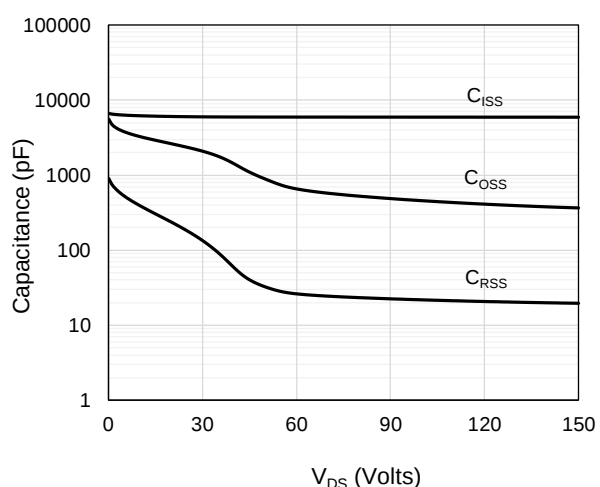
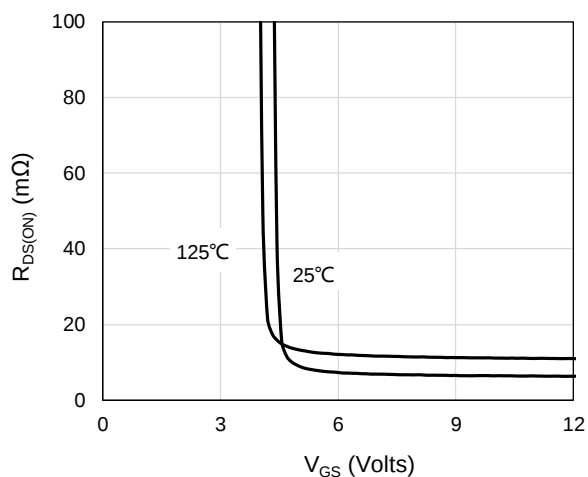
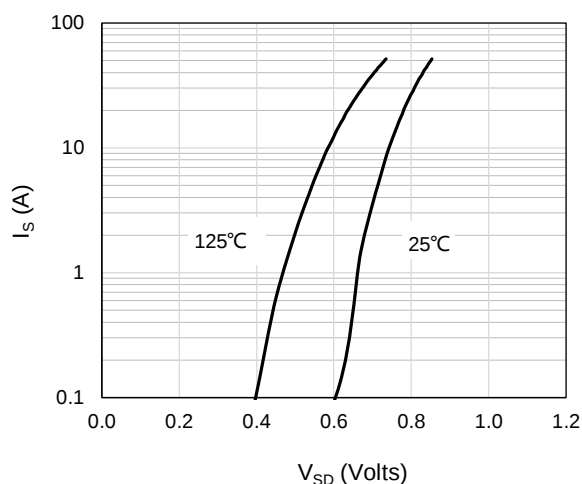
1. The max drain current rating is package limited
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. $L = 0.5 \text{ mH}$, $V_{DD} = 75\text{V}$, $I_{AS} = 50 \text{ A}$, $R_G = 25 \Omega$, Starting $T_J = 25^\circ\text{C}$
4. Mount on minimum PCB layout

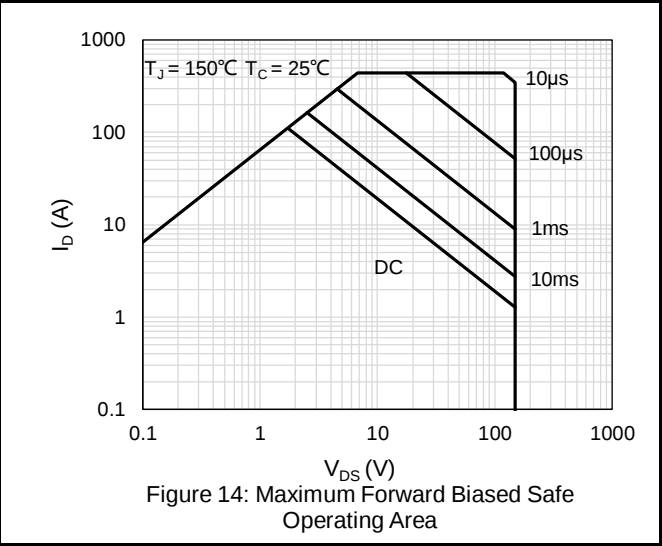
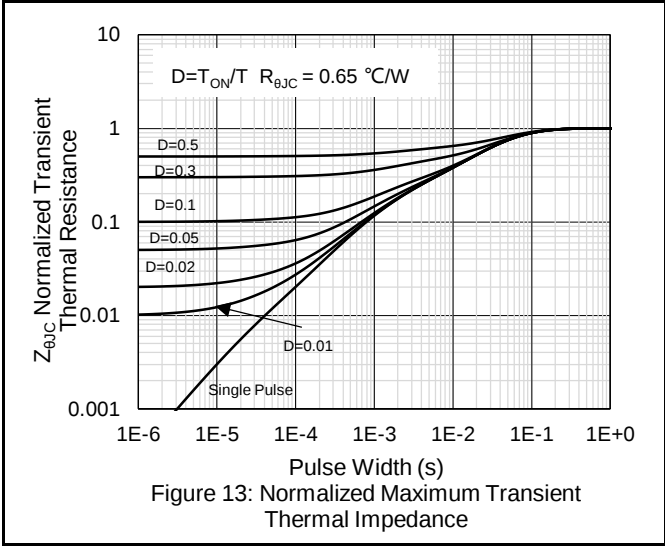
Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	150			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 150 V, V _{GS} = 0 V			1	μA
I _{GSS}	Gate Leakage Current	V _{GS} = ± 20 V, V _{DS} = 0 V			± 100	nA
V _{GS(TH)}	Gate Threshold voltage	V _{DS} = V _{GS} , I _D = 250 μA	2	3	4	V
R _{DS(ON)}	Drain-Source on-state resistance	V _{GS} = 10 V, I _D = 20 A		5.5	7	mΩ
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{DS} = 75 V, V _{GS} = 0 V, F = 1 MHz		5929		pF
C _{OSS}	Output Capacitance			546		pF
C _{RSS}	Reverse Transfer Capacitance			23		pF
R _G	Gate Resistance	F = 1 MHz		2.2		Ω
Switching Characteristics						
T _{D(ON)}	Turn On Delay Time	V _{DD} = 75 V , R _L = 3.75 Ω, V _{GS} = 10 V, R _G = 6 Ω		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 V , I _D = 20 A, V _{GS} = 10 V		84.3		nC
Q _{GS}	Gate-Source Charge			24.8		nC
Q _{GD}	Gate-Drain Charge			16.9		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Body-Diode Forward Current				110	A
I _{SM}	Maximum Pulsed Body-Diode Forward Current				440	A
V _{SD}	Diode Forward Voltage	V _{GS} = 0 V, I _S = 1 A		0.6	1	V
T _{RR}	Reverse recovery time	V _{DD} = 75 V, I _D = 15 A, di/dt = 100 A/μs		92		ns
Q _{RR}	Reverse recovery charge			364		nC
I _{RRM}	Peak Reverse Recovery Current			6.6		A

Electrical Characteristics Diagrams

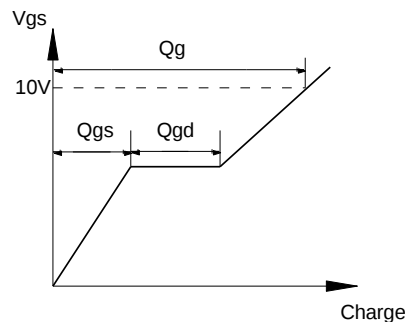
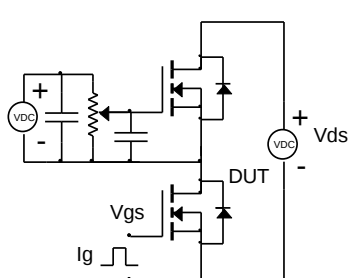




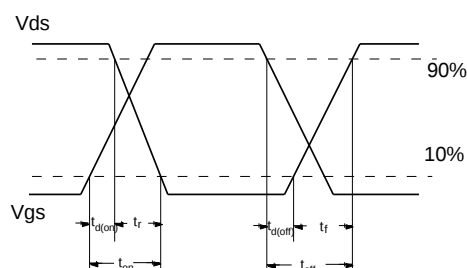
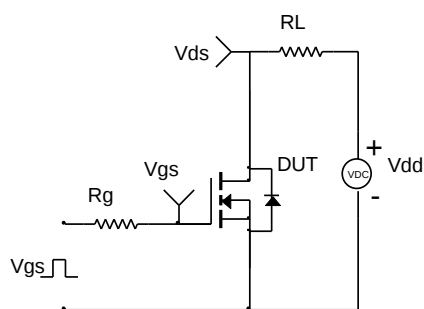


Test Circuit and Waveform

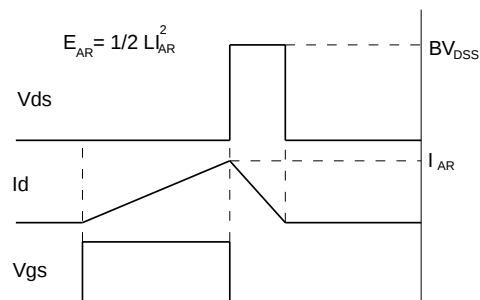
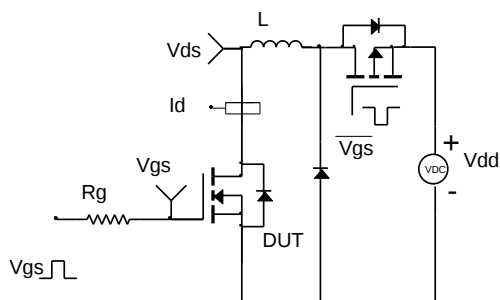
Gate Charge Test Circuit & Waveform



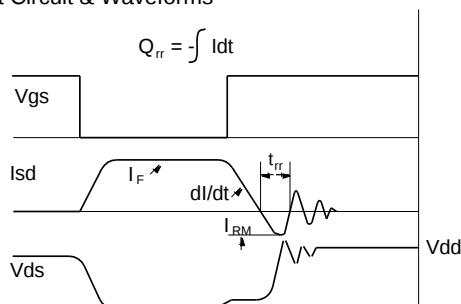
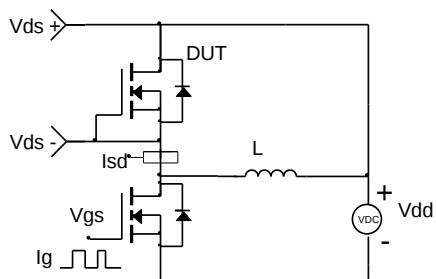
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Revision History

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

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.

The product described in this specification is not applicable for aerospace or other applications which requires high reliability. Customers using or selling these products for use in medical, life-saving, or life-sustaining applications do so at their own risk and agree to fully indemnify.

Due to product or technical improvements, the information described or contained herein may be changed without prior notice.
