



100V 15mohm N-channel SGT MOSFET

AKG100N15K

AKG100N15K Description

This N channel SGT MOSFET has been designed to very low on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, special for high efficiency power management applications.

AKG100N15K Features

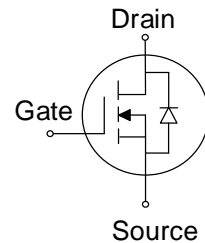
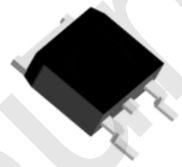
- N-channel, optimized for high-speed smooth switching
- Excellent Gate Charge $\times R_{DS(on)}$ (FOM)
- Very low on-resistance
- RoHS compliant (Note 1)
- Halogen-free (Note 1)

AKG100N15K Applications

- DC-DC converter
- Power Management
- Motor Drivers
- Load switching

AKG100N15K Key Performance Parameters

Parameter	Value	Unit
V_{DS}	100	V
$R_{DS(on), max} @ V_{GS}=10V$	15	m Ω
I_D	55	A



AKG100N15K Ordering Information

Ordering Code	Package Type	Marking Code	Form	Packing
AKG100N15K	TO-252	G100N15K	13 inches Reel	2500

Notes:

1. Contact ALKAIDSEMI sales for detail information



AKG100N15K 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)	55	A
	Drain Current -Continuous (T _C = 100°C)	35	A
I _{DM}	Drain Current - Pulsed (Note 1,2)	220	A
V _{GS}	Gate-Source Voltage	± 20	V
E _{AS}	Single Pulsed Avalanche Energy (Note 3)	8	mJ
P _D	Power Dissipation (T _C = 25°C)	83	W
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +150	°C

AKG100N15K Thermal Characteristics

Symbol	Parameter	Value	Units
R _{θJC}	Thermal Resistance, Junction-to-Case, Steady-State	1.5	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient, Steady State (Note 4)	62.5	°C/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 mH, V_{DD} = 20 V, I_{AS} = 5.5 A, R_G = 25 Ω, Starting T_J = 25 °C
4. Mount on minimum PCB layout



AKG100N15K Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)

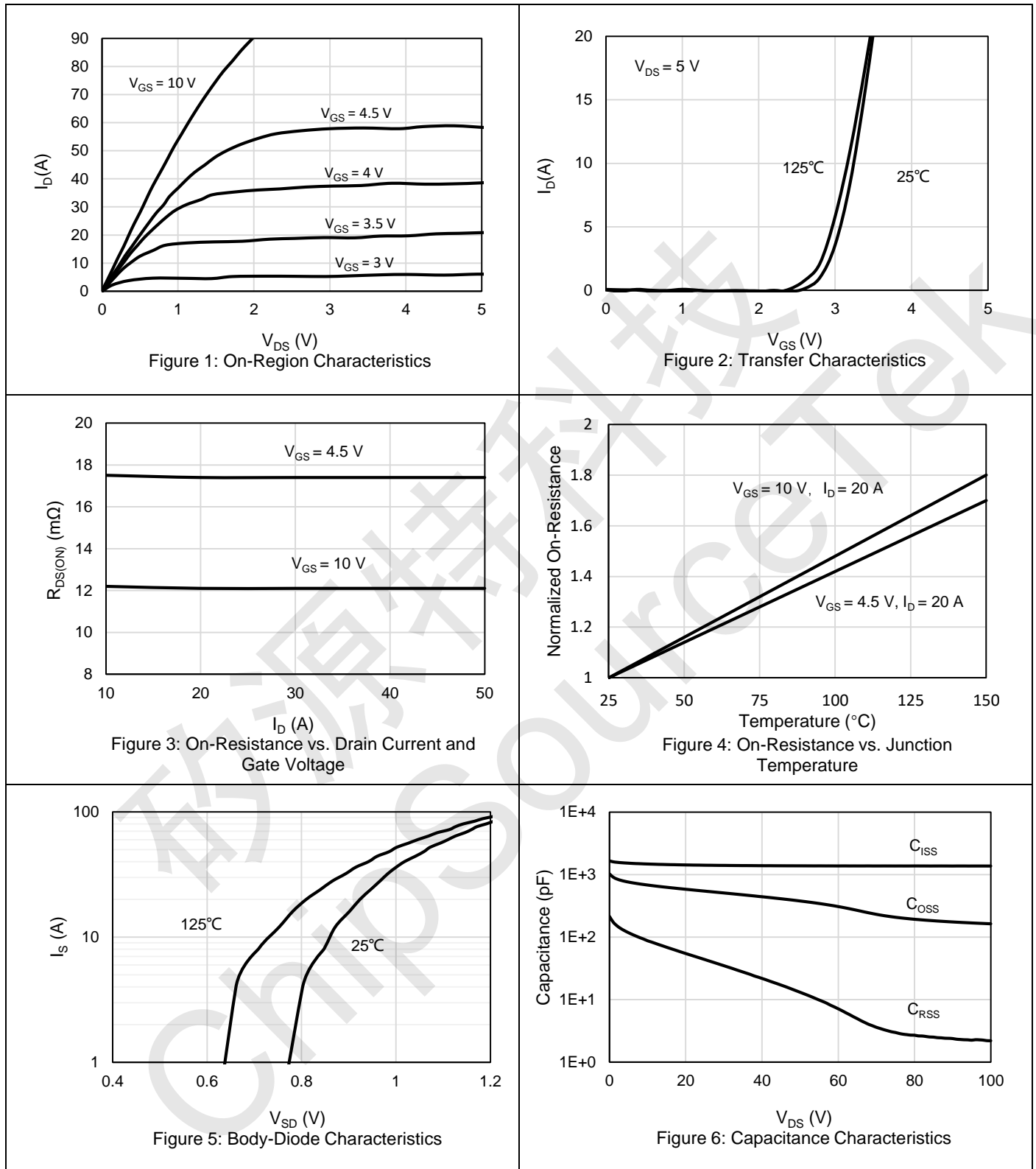
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 25^\circ\text{C}$			1	μA
I_{GSS}	Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$			± 100	nA
$V_{GS(TH)}$	Gate Threshold voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.4	2	2.5	V
$R_{DS(on)}$	Drain-Source on-state resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$		12.5	15	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$		15.6	22.5	
Dynamic Characteristics						
C_{ISS}	Input capacitance	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}, F = 1\text{ MHz}$		1441		pF
C_{OSS}	Output capacitance			391		pF
C_{RSS}	Reverse transfer capacitance			15		pF
Switching Characteristics						
$T_{D(ON)}$	Turn On Delay Time	$V_{DS} = 50\text{ V}, I_D = 20\text{ A}, V_{GS} = 10\text{ V}, R_{GEN} = 10\ \Omega$		7		ns
T_R	Rise Time			26		ns
$T_{D(OFF)}$	Turn Off Delay Time			30		ns
T_F	Fall Time			12		ns
Q_G	Total Gate Charge	$V_{DS} = 50\text{ V}, I_D = 20\text{ A}, V_{GS} = 10\text{ V}$		22		nC
Q_{GS}	Gate-Source Charge			5		nC
Q_{GD}	Gate-Drain Charge			4		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Body-Diode Forward Current				55	A
I_{SM}	Maximum Pulsed Body-Diode Forward Current (NOTE 1)				220	A
V_{SD}	Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 20\text{ A}$		0.89		V
T_{RR}	Reverse recovery time	$I_F = 50\text{ A}, di/dt = 100\text{ A}/\mu\text{S}$		38		ns
Q_{RR}	Reverse recovery charge				39	

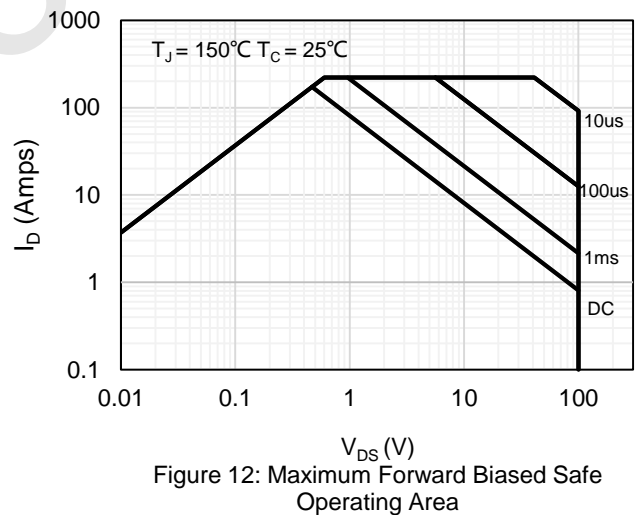
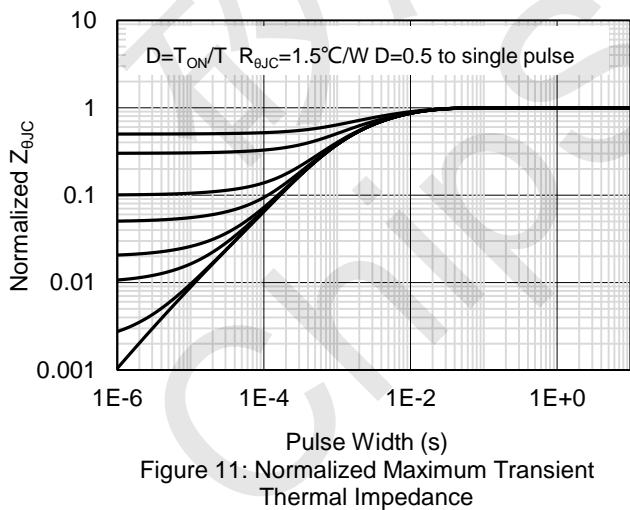
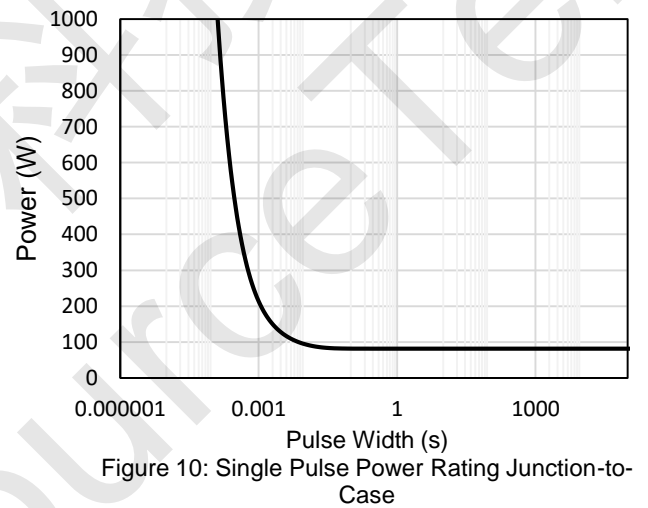
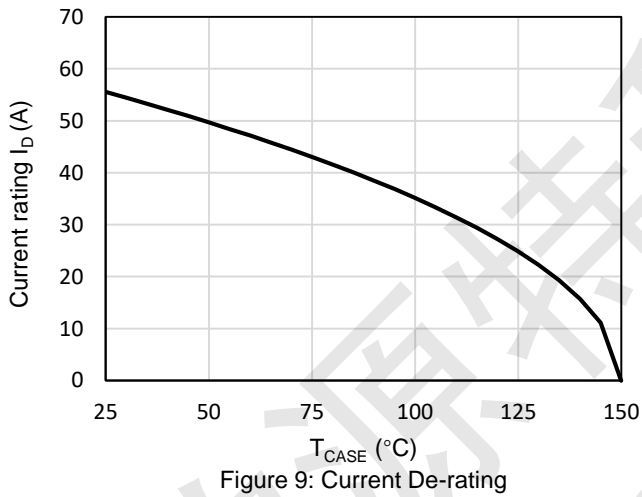
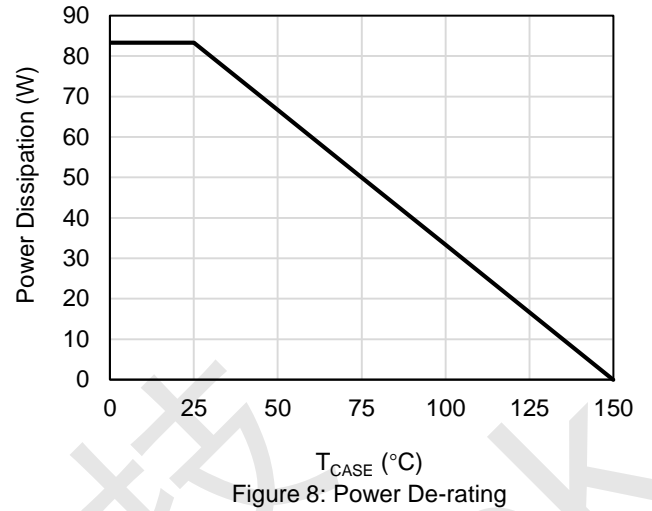
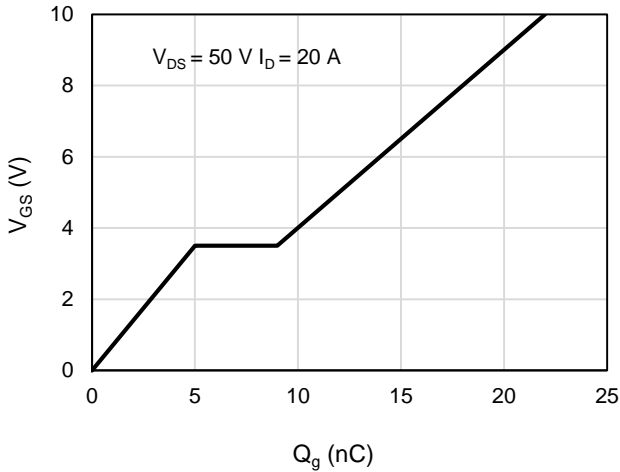
Notes:

1. Pulse Test: Pulse width $\leq 300\ \mu\text{s}$, Duty cycle $\leq 2\%$
2. Essentially independent of operating temperature



AKG100N15K Electrical Characteristics Diagrams

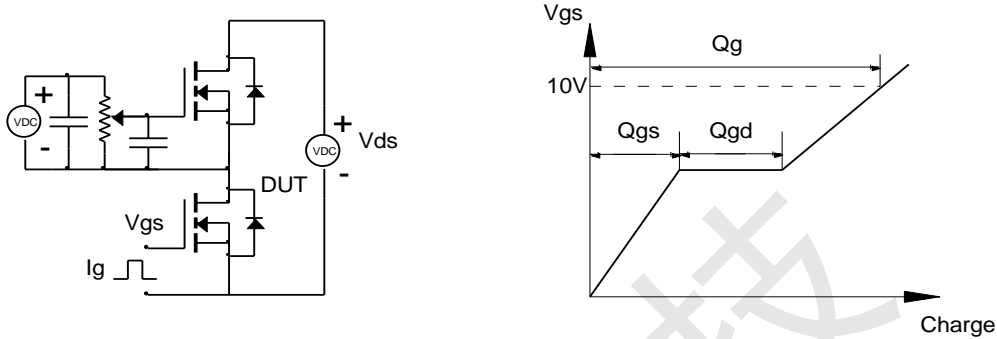




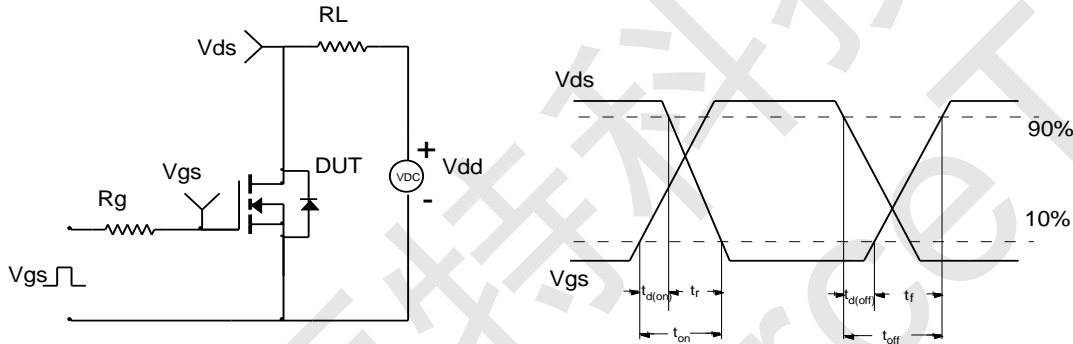


AKG100N15K Test Circuit and Waveform

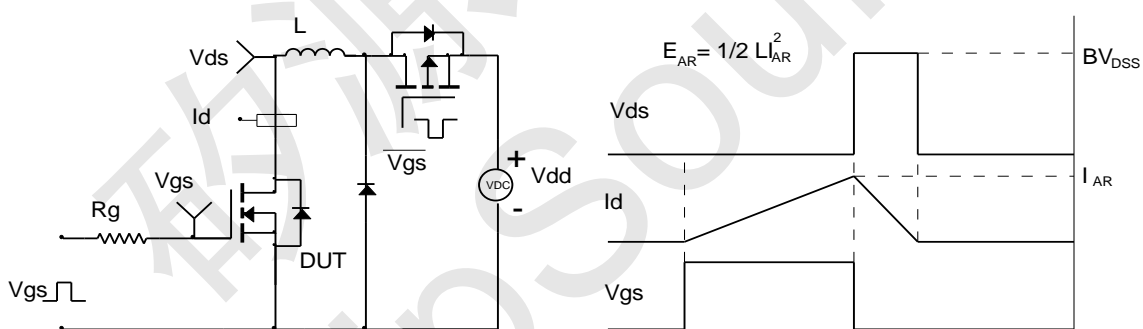
Gate Charge Test Circuit & Waveform



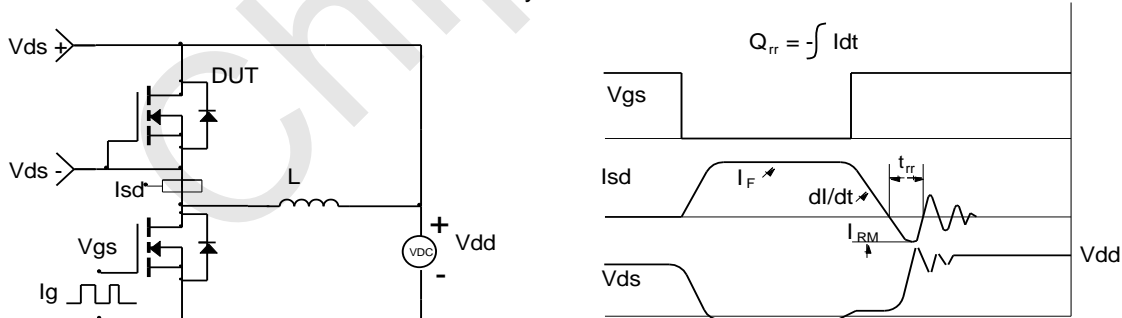
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

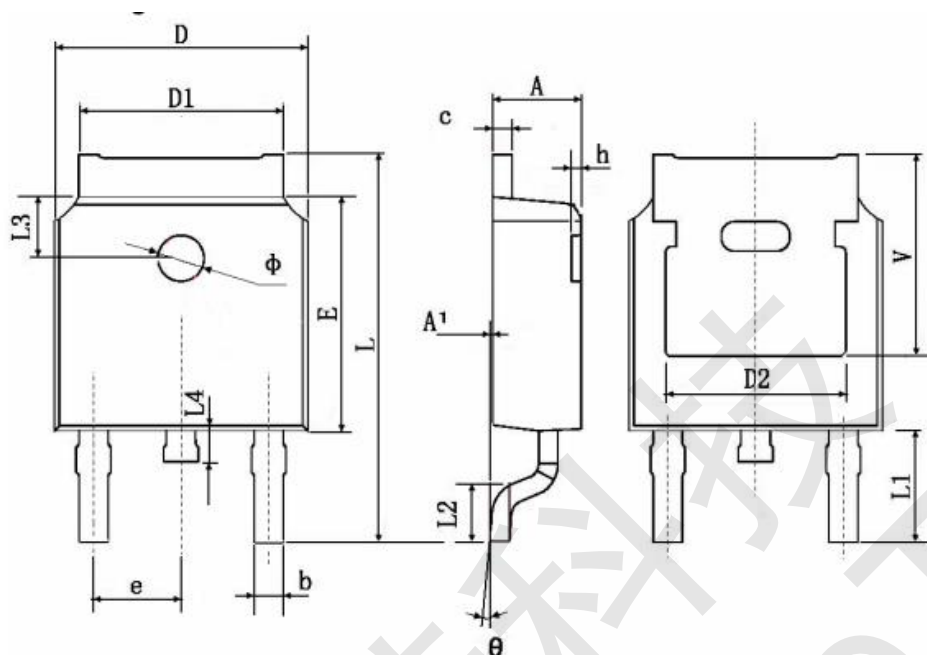


Diode Recovery Test Circuit & Waveforms





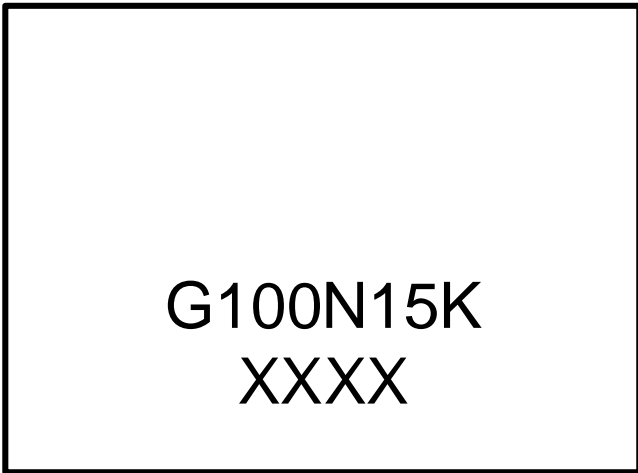
AKG100N15K Package Outlines



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.250	2.350	0.089	0.093
A1	0.050	0.150	0.002	0.006
b	0.660	0.860	0.026	0.034
c	0.458	0.558	0.018	0.022
D	6.550	6.650	0.259	0.263
D1	5.234	5.434	0.207	0.215
D2	4.826 TYP.		0.191 TYP.	
E	6.050	6.150	0.239	0.243
e	2.236	2.336	0.088	0.092
L	9.820	10.220	0.388	0.404
L1	3.000 TYP.		0.119 TYP.	
L2	1.400	1.600	0.055	0.063
L3	1.800 TYP.		0.071 TYP.	
L4	0.700	0.900	0.028	0.036
φ	1.150	1.250	0.045	0.049
θ	0°	3°	0°	3°
h	0.000	0.300	0.000	0.012
V	5.399 TYP		0.213 TYP	



AKG100N15K Marking Information



G100N15K
XXXX

Note:

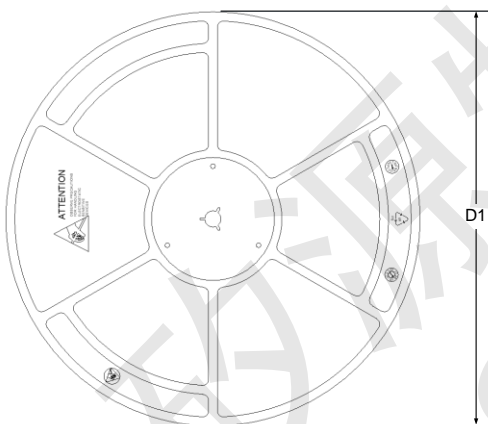
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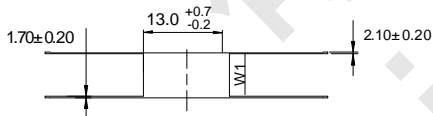
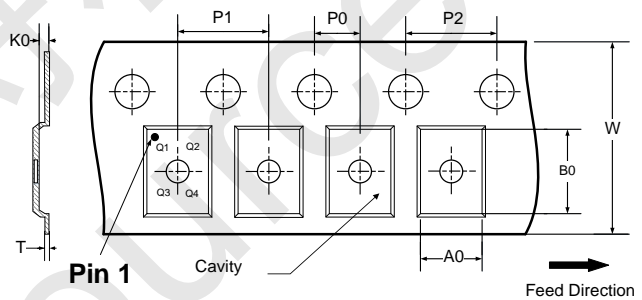
Contact ALKAIDSEMI sales for detail information

Reel and Tube Information

REEL DIMENSIONS



TAPE DIMENSIONS



- A0: Dimension designed to accommodate the component width
- B0: Dimension designed to accommodate the component length
- K0: Dimension designed to accommodate the component thickness
- W: Overall width of the carrier tape
- P0: Pitch between successive cavity centers and sprocket hole
- P1: Pitch between successive cavity centers
- P2: Pitch between sprocket hole
- T: Tape material thickness
- D1: Reel Diameter
- W1: Reel Width

DIMENSIONS										(Unit: mm)	
Reel	D1	W1									Material
	330	20.5									Hips
Tape	P0	P1	P2	W	A0	B0	K0	T	Pin 1 Quadrant	Material	
	4	8	2	16	6.9	10.5	2.9	0.27	Q1	PC	

All dimensions are nominal



Revision History

Revision	Release Date	Remark
Rev. 1.0	2021-12-09	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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