100V 15mohm N-channel SGT MOSFET

AKG100N15K

AKG100N15K Description

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

AKG100N15K Features

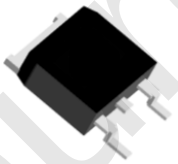
- N-channel, optimized for high-speed smooth switching
- Excellent Gate Charge × R_{DSON} (FOM)
- Very low on-resistance
- RoHS compliant (Note 1)
- Halogen-free (Note 1)

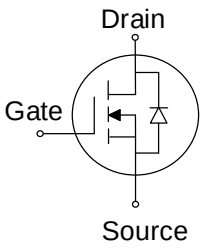
AKG100N15K Applications

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

AKG100N15K Key Performance Parameters

Parameter	Value	Unit
V_{DS}	100	V
$R_{DSON,\ max}$ @V_{GS}=10V	15	mΩ
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
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Steady-State	1.5	°C/W
$R_{\theta JA}$	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°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	100			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 80 V, V_{GS} = 0 V, T_J = 25℃			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	1.4	2	2.5	V
$R_{DS(On)}$	Drain-Source on-state resistance	V_{GS} = 10 V, I_D = 20 A		12.5	15	mΩ
		V_{GS} = 4.5 V, I_D = 20 A		15.6	22.5	
Dynamic Characteristics						
C_{ISS}	Input capacitance	V_{DS} = 50 V, V_{GS} = 0 V, F = 1 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 V, I_D =20 A, V_{GS} = 10 V, R_{GEN} = 10 Ω		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 V, I_D = 20 A, V_{GS} = 10 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 V, I_S = 20 A		0.89		V
T_{RR}	Reverse recovery time	I_F = 50 A, di/dt = 100 A/μS		38		ns
Q_{RR}	Reverse recovery charge			39		nC

Notes:

1. Pulse Test: Pulse width ≤ 300 us, Duty cycle ≤ 2%
2. Essentially independent of operating temperature

TEL: +86-0755-27595155 27595165
FAX: +86-0755-27594792
WEB:Http://www.ChipSourceTek.com
E-mail: Sales@ChipSourceTek.com Tony.Wang@ChipSourceTek.com

AKG100N15K Electrical Characteristics Diagrams

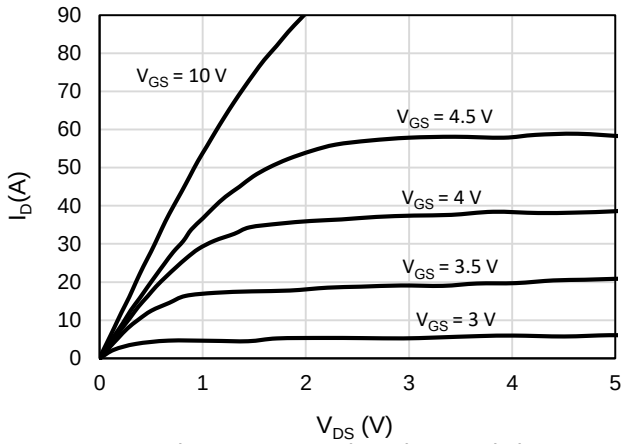


Figure 1: On-Region Characteristics

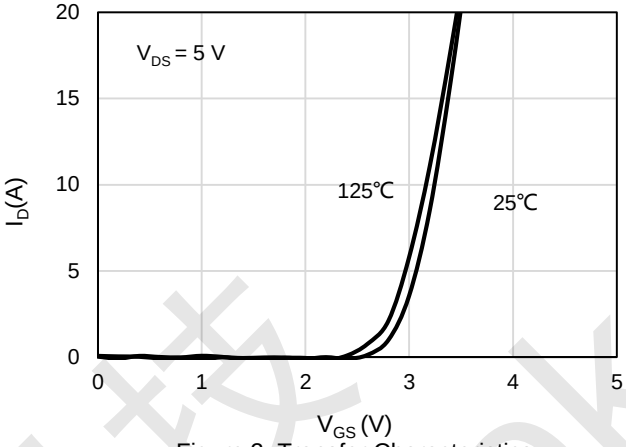


Figure 2: Transfer Characteristics

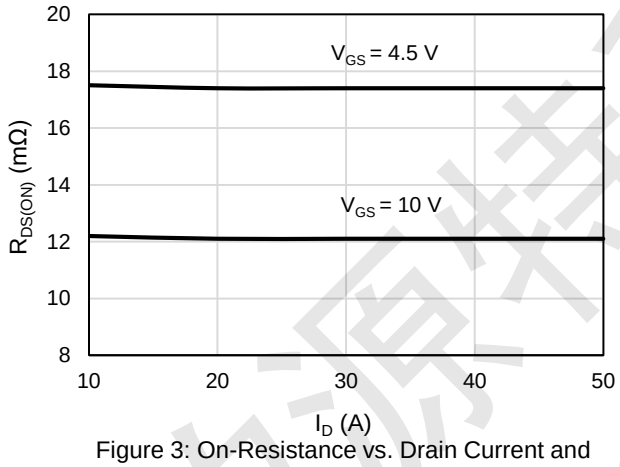


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

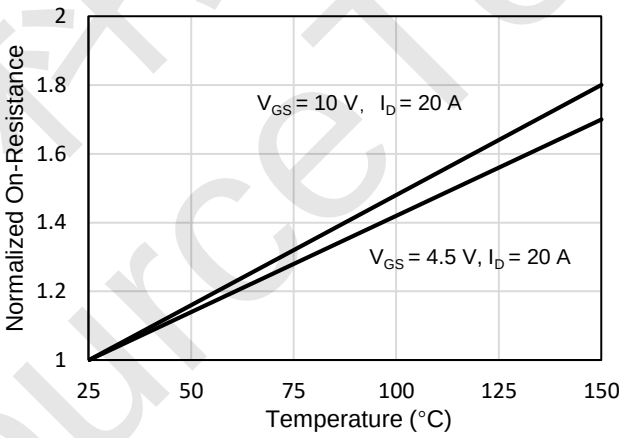


Figure 4: On-Resistance vs. Junction Temperature

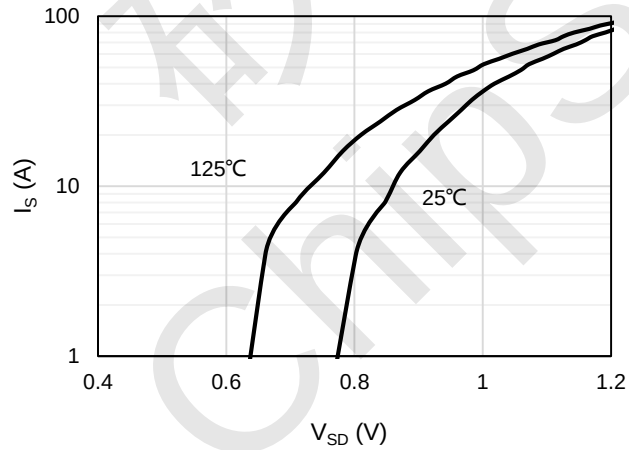


Figure 5: Body-Diode Characteristics

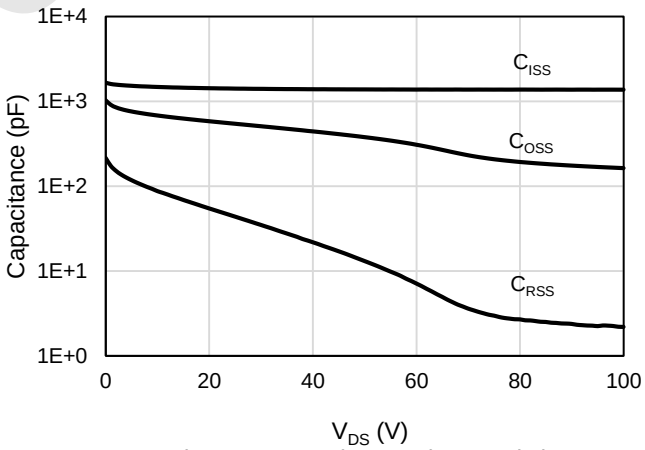


Figure 6: Capacitance Characteristics

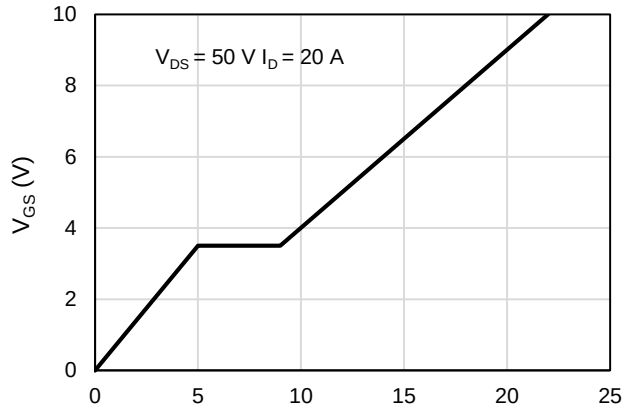


Figure 7: Gate-Charge Characteristics

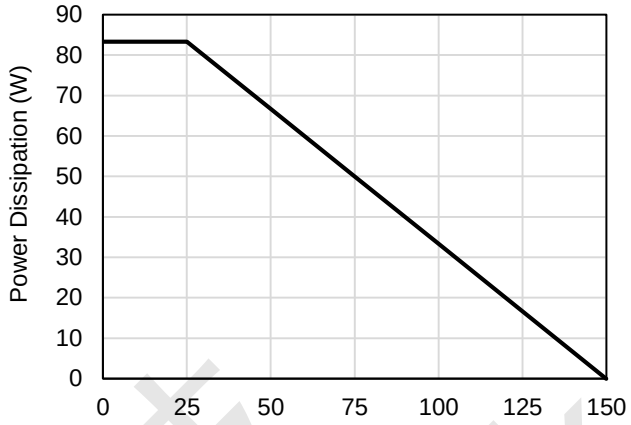


Figure 8: Power De-rating

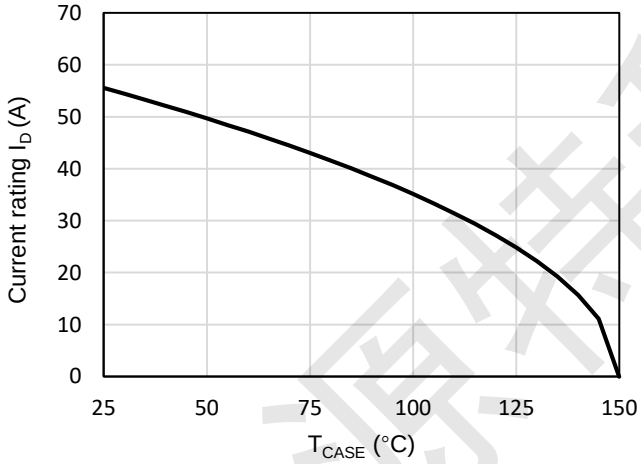


Figure 9: Current De-rating

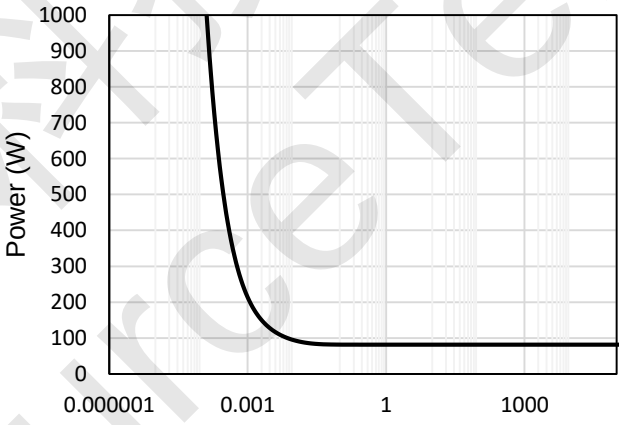


Figure 10: Single Pulse Power Rating Junction-to-Case

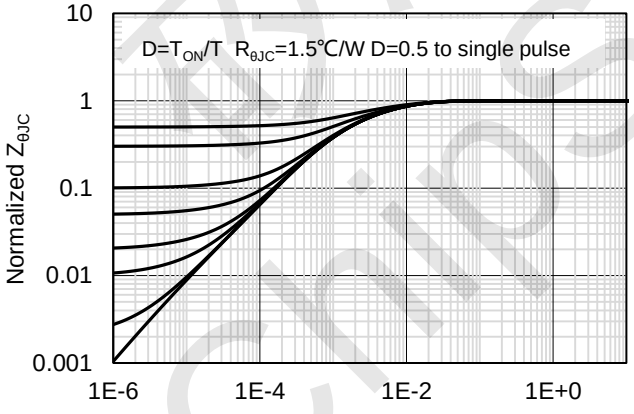


Figure 11: Normalized Maximum Transient Thermal Impedance

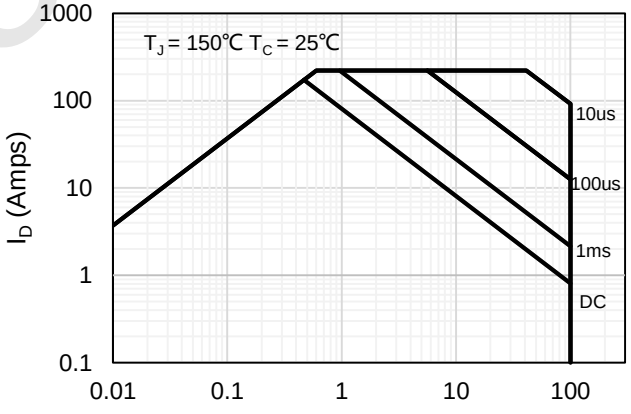
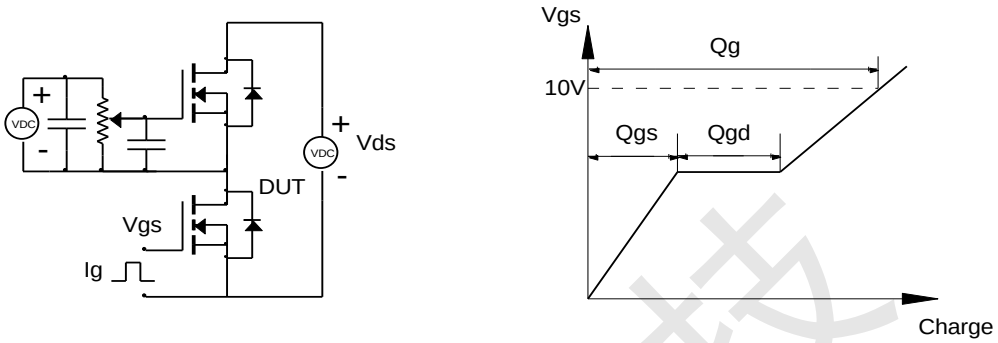


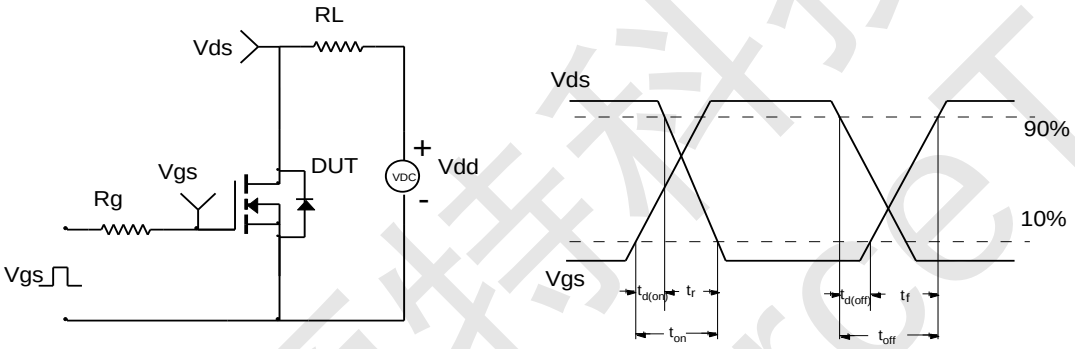
Figure 12: Maximum Forward Biased Safe Operating Area

AKG100N15K Test Circuit and Waveform

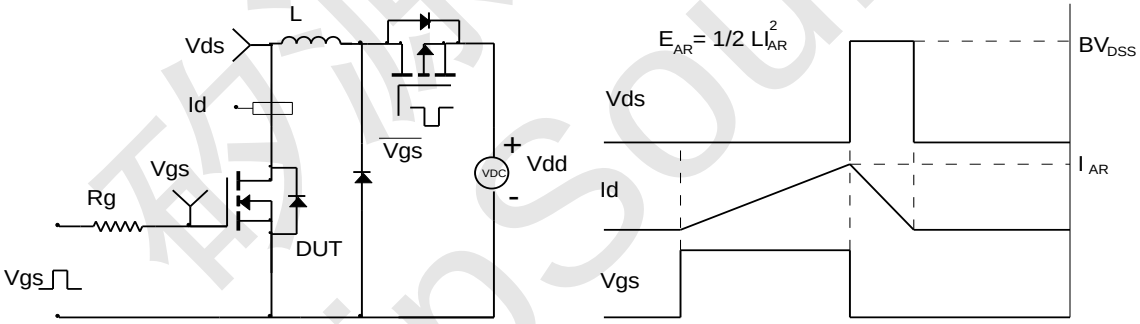
Gate Charge Test Circuit & Waveform



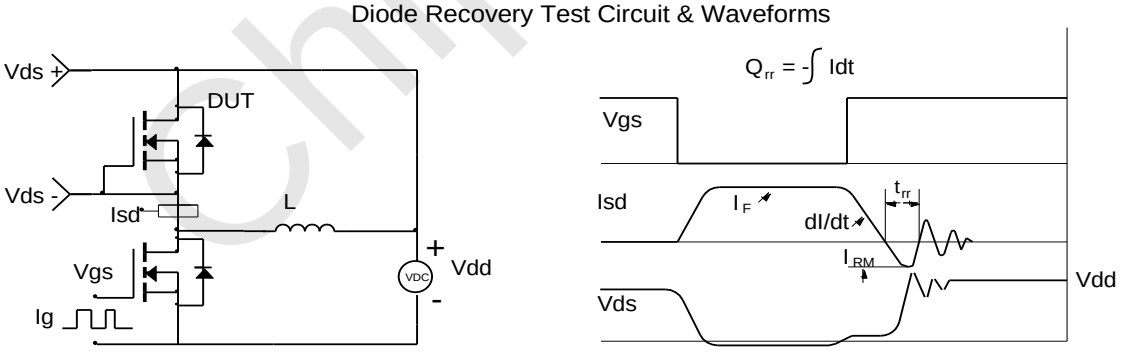
Resistive Switching Test Circuit & Waveforms



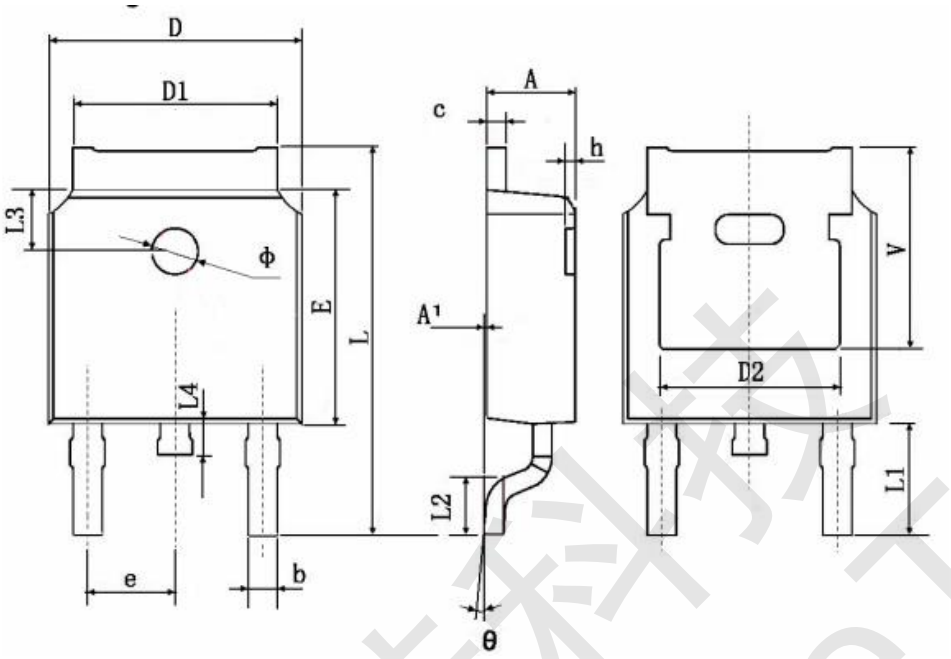
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



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	

TEL: +86-0755-27595155 27595165
FAX: +86-0755-27594792
WEB:Http://www.ChipSourceTek.com
E-mail: Sales@ChipSourceTek.com Tony.Wang@ChipSourceTek.com

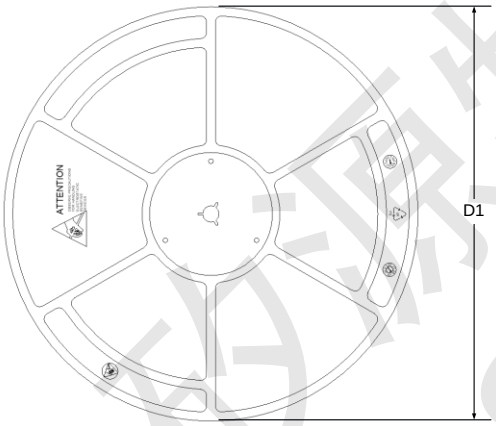
AKG100N15K Marking Information

G100N15K
XXXX

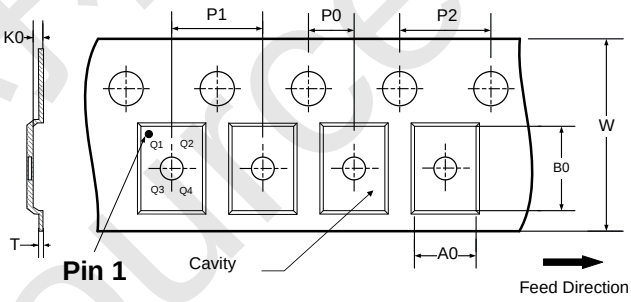
Note:
YYWW=Date code
G100N15K=Product Name Code
Contact ALKAIDSEMI sales for detail information

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)
	D1	W1								Material
Reel	330	20.5								Hips
	P0	P1	P2	W	A0	B0	K0	T	Pin 1 Quadrant	Material
Tape	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.

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.