



AKT30P55G 30V 4.6mohm P-channel Enhancement MOSFET

AKT30P55G Description:

This P Channel Trench MOSFET has been designed to low on-state resistance ($R_{DS(on)}$), suggested use for Load Switch, PWM application Power management and general-purpose applications.

AKT30P55G Features

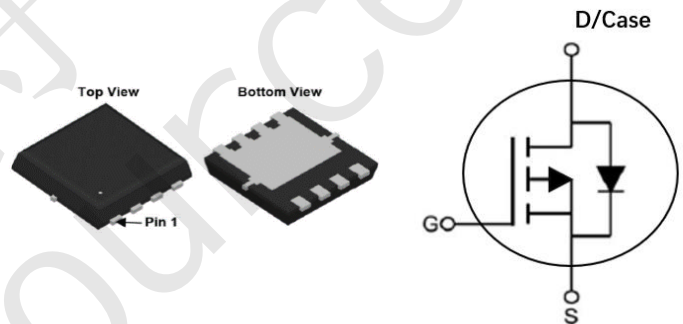
- Advanced Trench Technology
- Excellent Gate Charge $\times R_{DS(on)}$ (FOM)
- low on-resistance
- RoHS compliant (Note 1)
- Halogen-free (Note 1)

AKT30P55G Applications

- Battery Protection
- Load Switch
- Power Management

AKT30P55G Key Performance Parameters

Parameter	Value	Unit
V_{DS}	-30	V
$R_{DS(on)}$, max @ $V_{GS} = -4.5V$	4.6	m Ω
I_D	-55	A



AKT30P55G Ordering Information

Ordering Code	Package Type	Marking Code	Form	Packing
AKT30P55G	PDFN5X6-8L	AKT30P55G	13 inches Reel	5000

Notes:

1. Contact ALKAIDSEMI sales for detail information



AKT30P55G 30V 4.6mohm P-channel Enhancement MOSFET

AKT30P55G Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	-30	V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$) (Note 1,2)	-55	A
	Drain Current -Continuous ($T_C = 100^\circ\text{C}$) (Note 1,2)	-36	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)	180	mJ
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	70	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

AKT30P55G Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Steady-State	1.75	$^\circ\text{C}/\text{W}$

Notes:

1. The max drain current rating base on single die result
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. $L = 0.5 \text{ mH}$, $V_{DD} = -15 \text{ V}$, $I_{AS} = -26 \text{ A}$, $R_G = 25 \Omega$, Starting $T_J = 25^\circ\text{C}$
4. Mount on minimum pad layout FR-4 PCB
5. Pulse Test: Pulse width $\leq 300 \text{ us}$, Duty cycle $\leq 2\%$



AKT30P55G 30V 4.6mohm P-channel Enhancement MOSFET

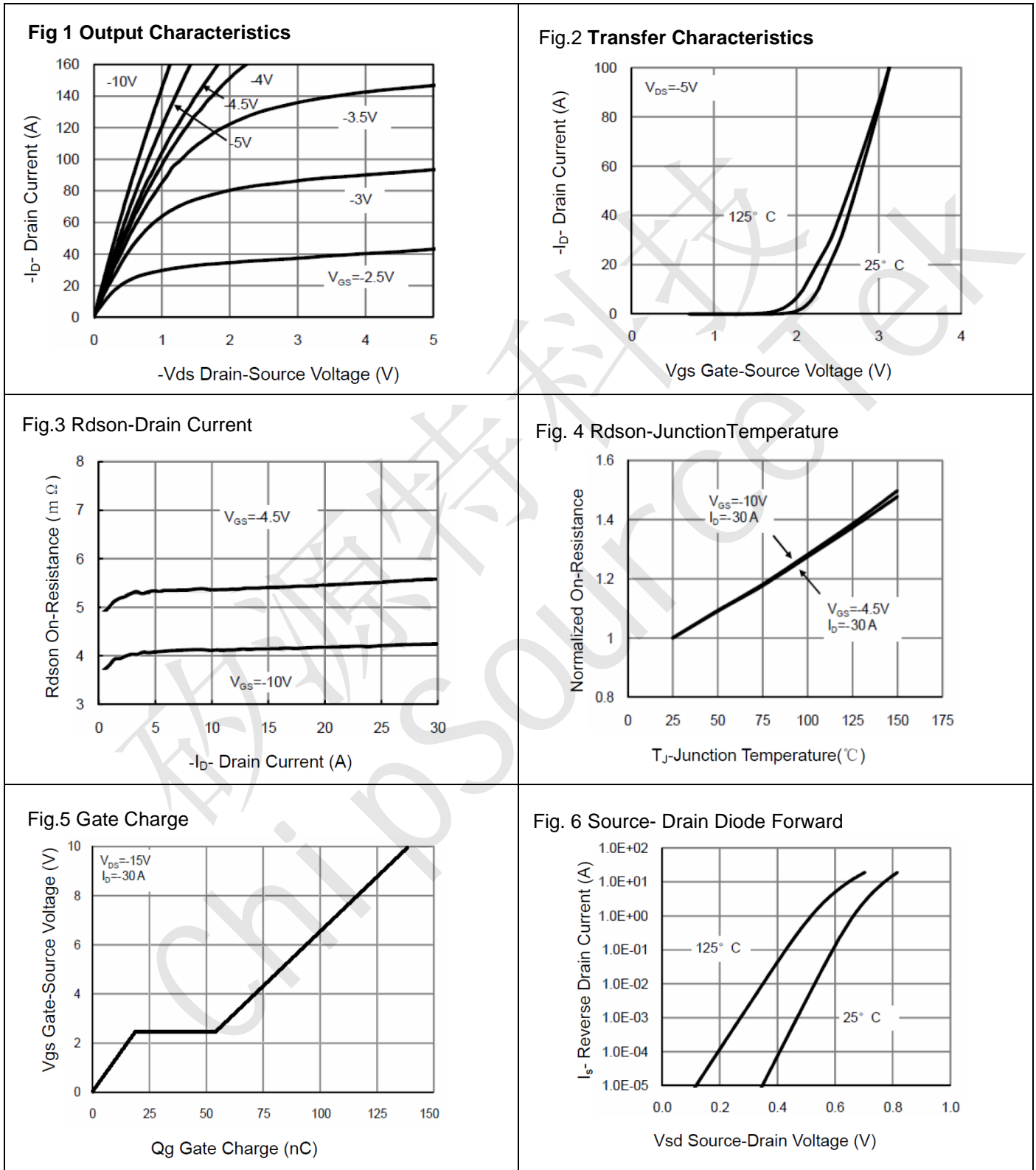
AKT30P55G Electrical Characteristics (T_J = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = -250 μA	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -30 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	-1.0	-1.6	-2.5	V
R _{DS(ON)}	Drain-Source on-state resistance	V _{GS} = -10 V, I _D = -30 A		3.7	4.6	mΩ
		V _{GS} = -4.5 V, I _D = -20 A		5.1	6.6	mΩ
Dynamic Characteristics						
C _{ISS}	Input capacitance	V _{DS} = -15 V, V _{GS} = 0 V, F = 1.0 MHz		4122		pF
C _{OSS}	Output capacitance			680		pF
C _{RSS}	Reverse transfer capacitance			508		pF
Switching Characteristics						
T _{D(ON)}	Turn On Delay Time	V _{DS} = -15 V, I _D = -30 A, V _{GS} = -10 V, R _G = 2.5 mΩ (Note 5)		18		ns
T _R	Rising Time			16		ns
T _{D(OFF)}	Turn Off Delay Time			59		ns
T _F	Fall Time			13		ns
Q _G	Total Gate Charge	V _{DS} = -15 V, I _D = -30 A, V _{GS} = -10 V (Note 5)		124		nC
Q _{GS}	Gate-Source Charge			16		nC
Q _{GD}	Gate-Drain Charge			32.1		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			-1.2	V
T _{RR}	Reverse recovery time	I _F = -30 A, di/dt = 100 A/μS			50	ns
Q _{RR}	Reverse recovery charge				45	nC



AKT30P55G 30V 4.6mohm P-channel Enhancement MOSFET

AKT30P55G Electrical Characteristics Diagrams





AKT30P55G 30V 4.6mohm P-channel Enhancement MOSFET

Fig.7 Capacitance vs Vds

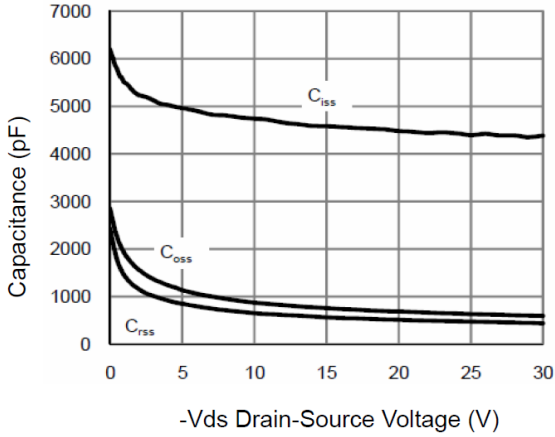


Fig. 8 BVDSS vs Junction Temperature

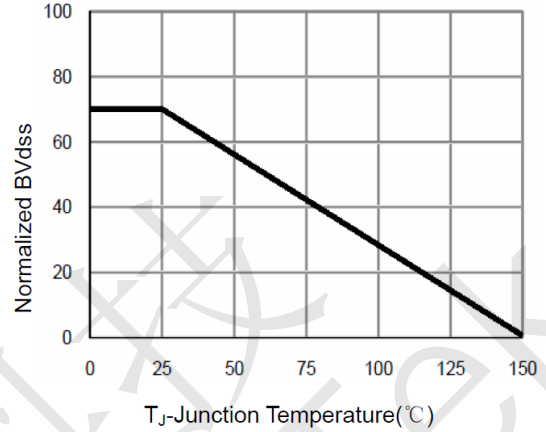
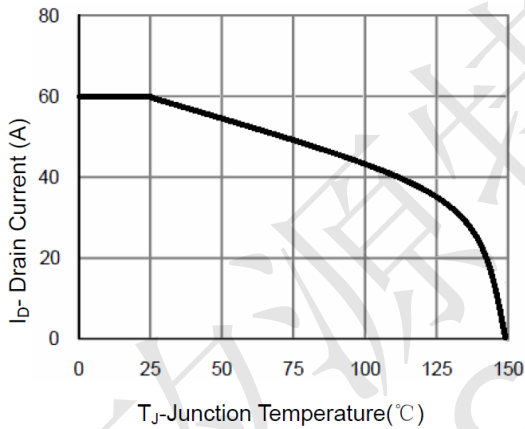


Fig.9 ID Current Derating vs Junction Temperature





AKT30P55G 30V 4.6mohm P-channel Enhancement MOSFET

Fig. 10 Safe Operation Area

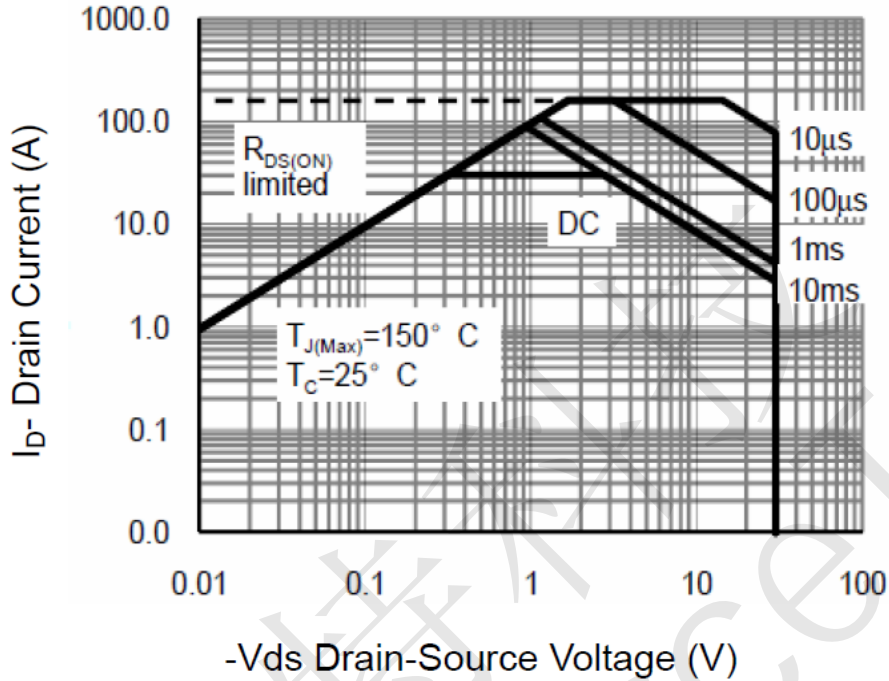
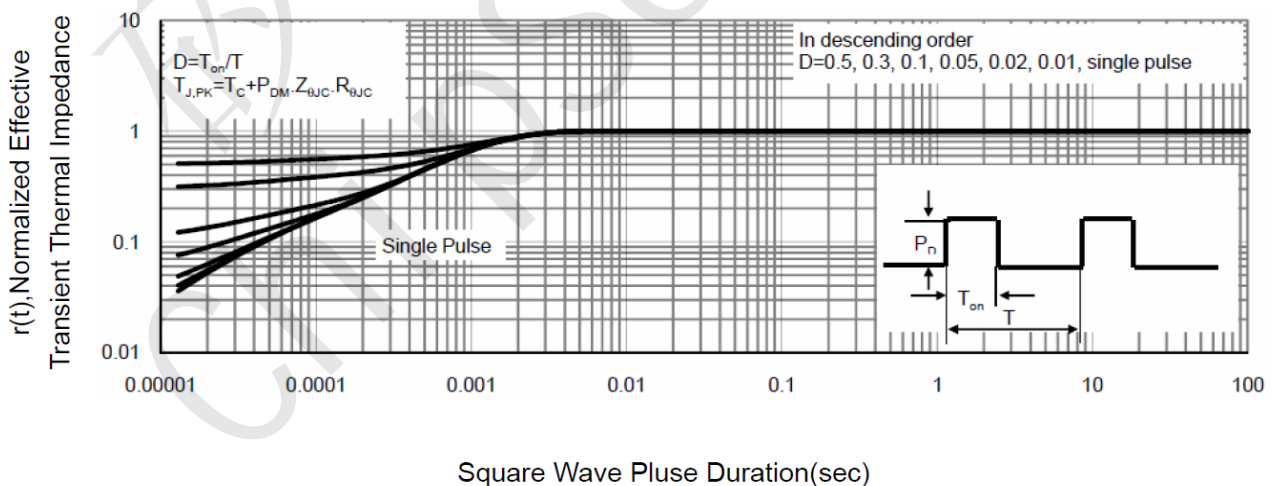


Fig. 11 Transient Thermal Response Curve

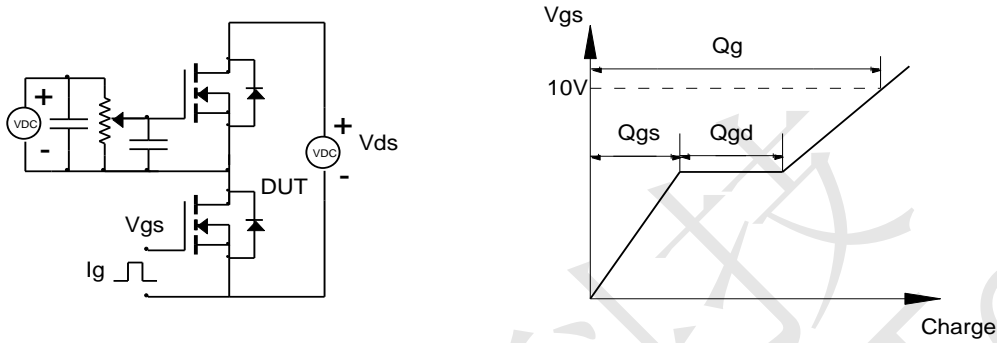




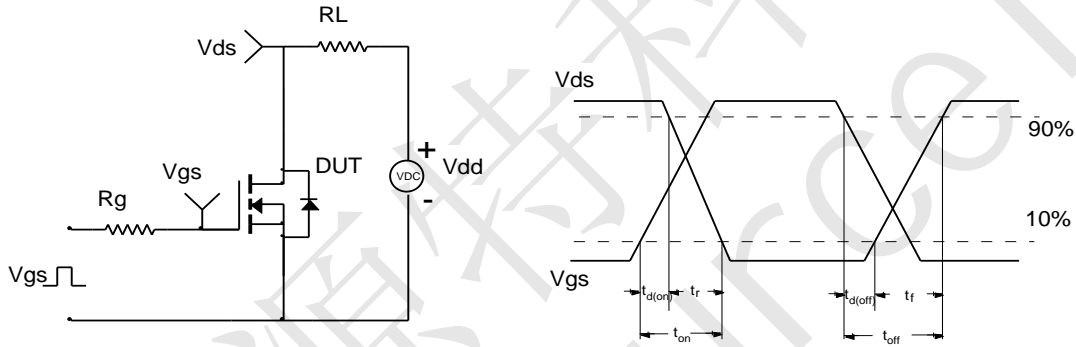
AKT30P55G 30V 4.6mohm P-channel Enhancement MOSFET

AKT30P55G Test Circuit and Waveform

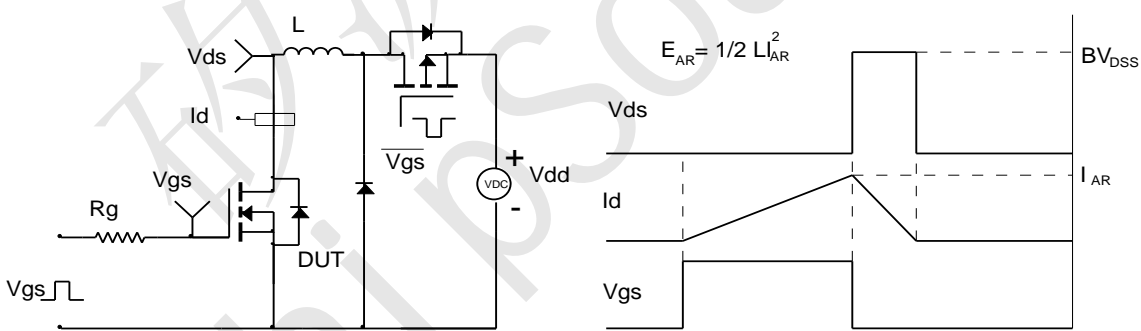
Gate Charge Test Circuit & Waveform



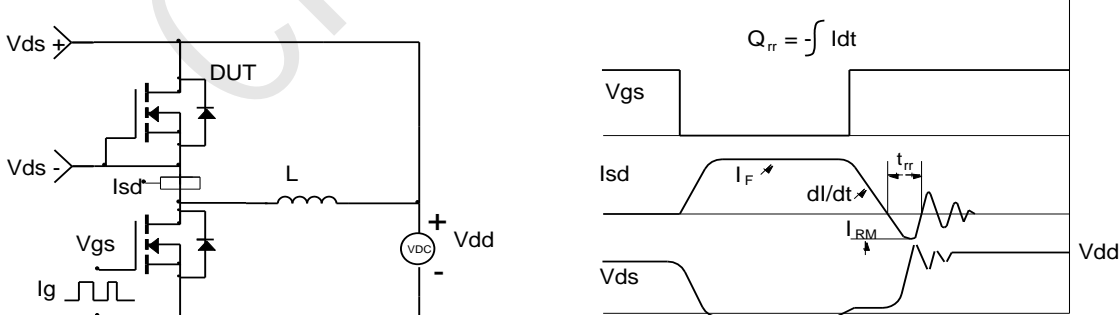
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



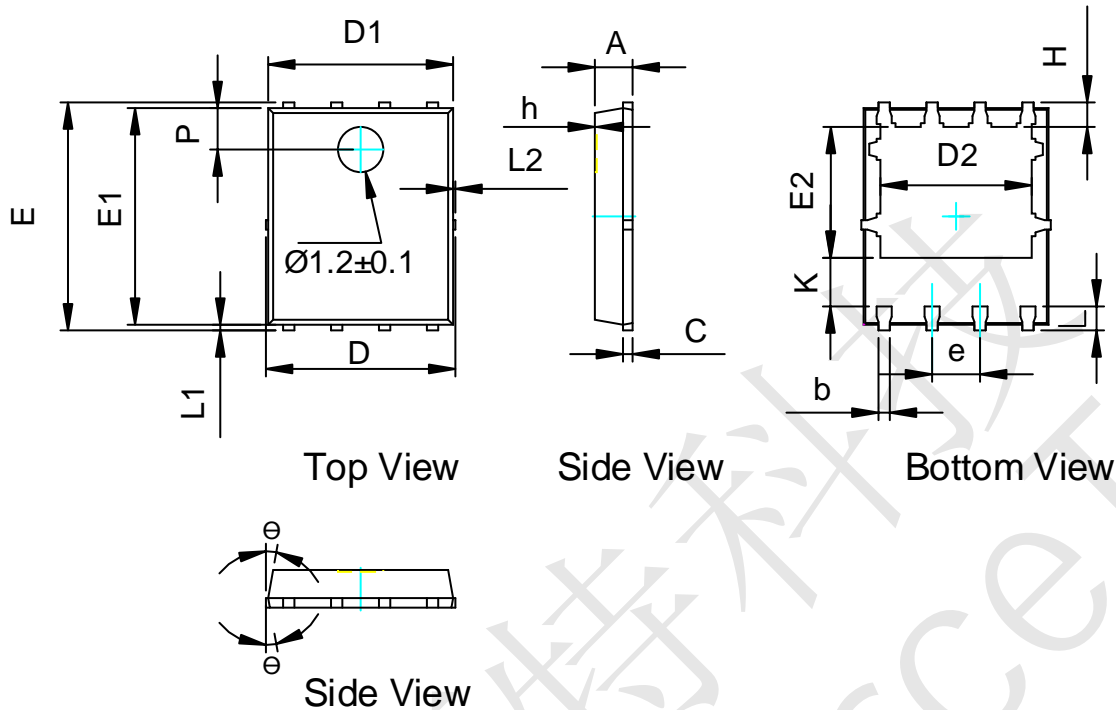
Diode Recovery Test Circuit & Waveforms





AKT30P55G 30V 4.6mohm P-channel Enhancement MOSFET

AKT30P55G Package Outlines

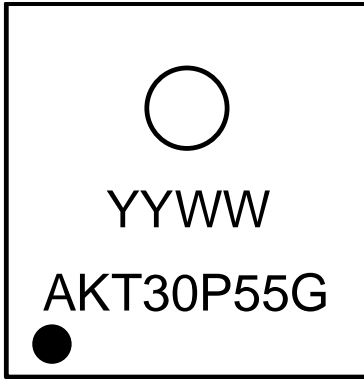


SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.20	0.30	0.40
c	0.21	0.25	0.34
D	-	-	5.10
D1	4.80	4.90	5.00
D2	3.91	4.01	4.11
e	1.27 BSC		
E	5.90	6.00	6.10
E1	5.65	5.75	5.85
E2	3.375	3.475	3.575
H	0.55	0.65	0.75
h	-	-	0.05
K	1.20	-	-
L	0.55	0.65	0.75
L1	0.05	0.15	0.25
L2	-	-	0.12
Θ	8°	10°	12°
P	1.00	1.10	1.20



AKT30P55G 30V 4.6mohm P-channel Enhancement MOSFET

AKT30P55G Marking Information



Note:

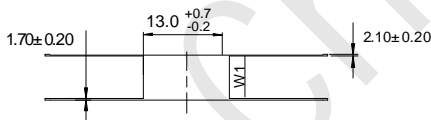
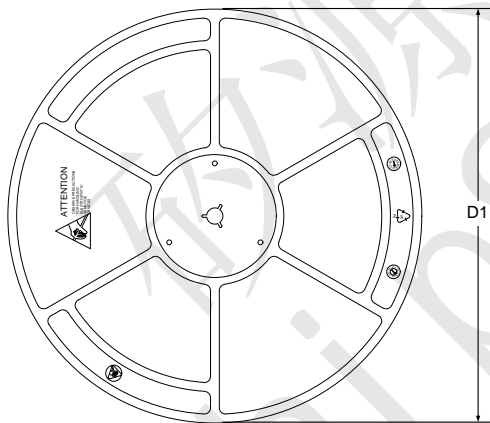
YYWW = Date code

AKT30P55G = Product Name Code

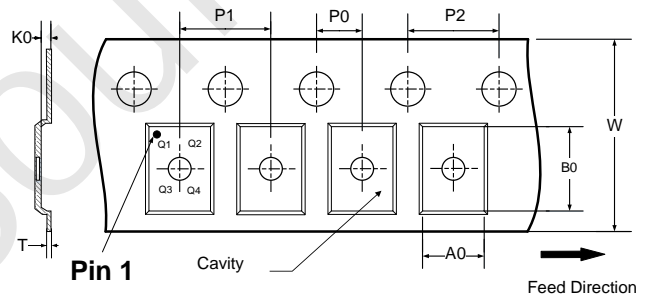
Contact ALKAIDSEMI sales for detail information

AKT30P55G 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	12.5								Hips
Tape	P0	P1	P2	W	A0	B0	K0	T	Pin 1 Quadrant	Material
	4	8	2	12	3.6	3.6	1.05	0.3	Q1	PC

All dimensions are nominal



AKT30P55G 30V 4.6mohm P-channel Enhancement MOSFET

AKT30P55G Revision History

Revision	Release Date	Remark
Rev.1.0	2022-02-14	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.