

600V 47A N-Channel MOSFET With Fast-Recovery

Description

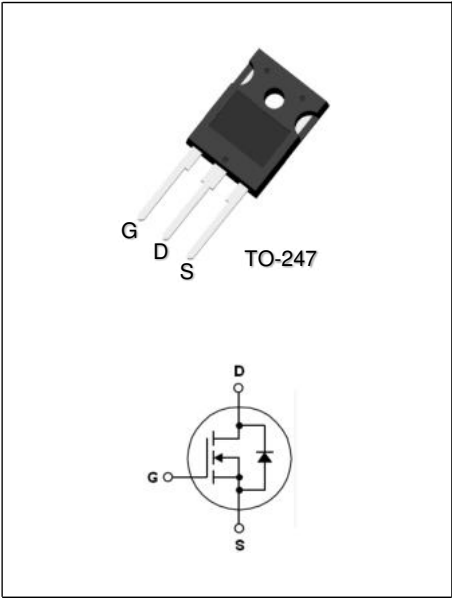
AKT47N60HCM is utilizing an advanced chage balance m echanism for outstanding low on-resistance and lower gate charge performance.

This advanced technology has been tailored to minimize conduction loss, provide superior switching performance, and withstand extreme dv/dt rate and higher avalanche energy.

AKQH47N60CM is suitable for AC/DC power conversion in switching mode operation for higher efficiency.

Features

- Low on-Resistance:  $R_{DS(on)}=55m\Omega$ (typ.)
- Fast-Recovery body diode
- 100% Avalanche Test
- Extremely Low Reverse Recovery Charge
- Ultra Low Gate Charge (typ.Qg=180nC)



Applications

- DC-DC Converters and AC-DC Power Supply

Absolute Maximum Ratings @ $T_C=25\text{ }^{\circ}\text{C}$  unless otherwise noted

Symbol	Parameter		Ratings	Unit
$V_{DSS}$	Drain to Source Voltage		600	V
$V_{GSS}$	Gate to Source Voltage		$\pm 30$	V
$I_D$	Drain Current	$T_C=25^{\circ}\text{C}$	47	A
		$T_C=100^{\circ}\text{C}$	29	A
$I_{DM}$	Pulsed Drain Current	(Note1)	140	A
$P_D$	Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	391	W
	Derate above $25^{\circ}\text{C}$		3.13	W/ $^{\circ}\text{C}$
$E_{AS}$	Single Pulsed Avalanche Energy	(Note 2)	360	mJ
$T_J$	Operating Junction Temperature Range		-55~+150	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature Range		-55~+150	$^{\circ}\text{C}$

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{th(J-C)}$	Thermal Resistance, Junction to case	0.32	$^{\circ}\text{C/W}$
$R_{th(J-A)}$	Thermal Resistance, Junction to Ambient	62	$^{\circ}\text{C/W}$

**Electrical Characteristics** @T<sub>C</sub>=25 °C unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain to Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	600	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.5	-	4.5	V
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =23A	-	55	-	mΩ
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =V <sub>DSS</sub> , V <sub>GS</sub> =0V	-	-	5	μA
I <sub>GSS</sub>	Gate to Source Leakage Current	V <sub>GS</sub> =V <sub>GSS</sub> , V <sub>DS</sub> =0V	-	-	±100	nA

**D-S Diode Characteristics and Maximum Rating** @T<sub>C</sub>=25 °C unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Maximum Drain to Source Diode Forward Current		-	-	47	A
V <sub>SD</sub>	Drain-Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =47A	-	0.95	1.5	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> =0V, I <sub>S</sub> =23A,	-	0.23	-	us
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=-100A/us	-	3	-	uC

**Switching Characteristics** @T<sub>C</sub>=25 °C unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t <sub>d(on)</sub>	Turn-on Delay Time	I <sub>D</sub> =23A, V <sub>DD</sub> =480V, R <sub>G</sub> =20Ω (Note 3)	-	20	-	ns
t <sub>r</sub>	Rising Time		-	15	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	95	-	ns
t <sub>f</sub>	Falling Time		-	8	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz	-	3215	-	pF
C <sub>oss</sub>	Output Capacitance		-	630	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	18	-	pF
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =23A, V <sub>DS</sub> =480V V <sub>GS</sub> =10V (Note 3)	-	180	-	nC
Q <sub>gs</sub>	Gate to Source Charge		-	24	-	nC
Q <sub>gc</sub>	Gate to Drain Charge		-	94	-	nC

**Note:**

1. Repetitive rating: pulse-width limited by maximum junction temperature
2. I<sub>DS</sub>=12A, V<sub>DD</sub>=100V, V<sub>G</sub>=10V, @T<sub>C</sub>=25°C
3. Essentially independent of operating temperature typical characteristics

**Package Dimensions**

**TO-247**

(Dimensions in Millimeters)

