

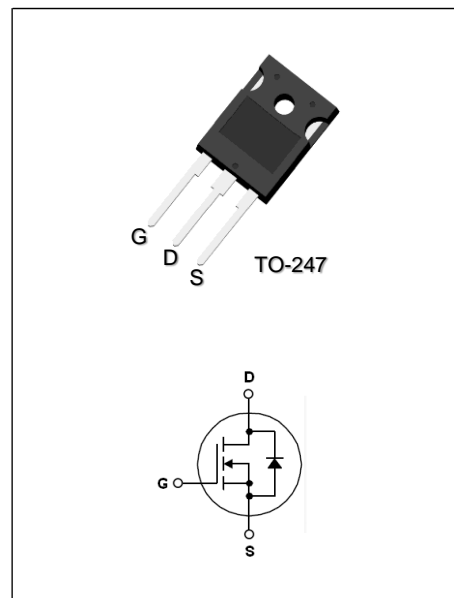
## 600V 47A N-Channel MOSFET With Fast-Recovery

### Description

AKT47N60HCM is utilizing an advanced charge balance mechanism 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.  $Q_g=180nC$ )

### Applications

- DC-DC Converters and AC-DC Power Supply

### Absolute Maximum Ratings @ $T_C=25^\circ C$ 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	$T_C=25^\circ C$	47
		$T_C=100^\circ C$	29
$I_{DM}$	Pulsed Drain Current (Note1)	140	A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ C$	391
	Derate above $25^\circ C$		3.13
$E_{AS}$	Single Pulsed Avalanche Energy (Note 2)	360	mJ
$T_J$	Operating Junction Temperature Range	-55~+150	$^\circ C$
$T_{STG}$	Storage Temperature Range	-55~+150	$^\circ C$

### Thermal Characteristics

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

**Electrical Characteristics** @ $T_C=25\text{ }^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	600	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	-	4.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=23A$	-	55	-	m $\Omega$
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=V_{DSS}, V_{GS}=0V$	-	-	5	$\mu A$
$I_{GSS}$	Gate to Source Leakage Current	$V_{GS}=V_{GSS}, V_{DS}=0V$	-	-	$\pm 100$	nA

**D-S Diode Characteristics and Maximum Rating** @ $T_C=25\text{ }^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Maximum Drain to Source Diode Forward Current		-	-	47	A
$V_{SD}$	Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=47A$	-	0.95	1.5	V
$t_{rr}$	Reverse Recovery Time	$V_{GS}=0V, I_S=23A,$	-	0.23	-	$\mu s$
$Q_{rr}$	Reverse Recovery Charge	$di/dt=-100A/\mu s$	-	3	-	$\mu C$

**Switching Characteristics** @ $T_C=25\text{ }^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$I_D=23A,$ $V_{DD}=480V,$ $R_G=20\Omega$ (Note 3)	-	20	-	ns
$t_r$	Rising Time		-	15	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	95	-	ns
$t_f$	Falling Time		-	8	-	ns
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=25V,$ $f=1.0MHz$	-	3215	-	pF
$C_{oss}$	Output Capacitance		-	630	-	pF
$C_{riss}$	Reverse Transfer Capacitance		-	18	-	pF
$Q_g$	Total Gate Charge	$I_D=23A,$ $V_{DS}=480V$ $V_{GS}=10V$ (Note 3)	-	180	-	nC
$Q_{gs}$	Gate to Source Charge		-	24	-	nC
$Q_{gc}$	Gate to Drain Charge		-	94	-	nC

**Note:**

1. Repetitive rating: pulse-width limited by maximum junction temperature
2.  $I_{DS}=12A, V_{DD}=100V, V_G=10V, @T_C=25^\circ C$
3. Essentially independent of operating temperature typical characteristics

**Package Dimensions**

**TO-247**

(Dimensions in Millimeters)

