

### General Description

Utilizing Analogic Tech's state-of-the-art TrenchDMOS<sup>®</sup> process, the AHK6030LX sets a new standard in current handling capability and efficiency for surface mount power MOSFETs.

Gate charge and  $R_{DS(ON)}$  have been optimized and package inductance minimized to provide high efficiency for DC-DC.

### Applications

- DC-DC converters for CPU's
- High Current Load Switch

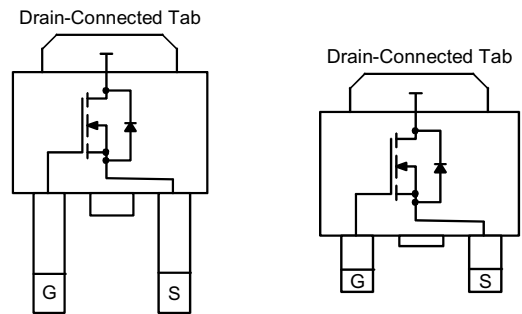
### Features

**PWMSwitch™**

- $V_{DS(MAX)} = 30V$
- $I_{D(MAX)}^{(a)} = 52 A @ 25^{\circ}C$
- $I_{APP(MAX)} = 20A$  in typical computer application
- Low Gate Charge
- Low  $R_{DS(ON)}$ :  
 $10.5 m\Omega$  (max),  $9.5 m\Omega$  (typ)@  $V_{GS} = 10V$   
 $18 m\Omega$  (max),  $14 m\Omega$  (typ)@  $V_{GS} = 4.5V$

### DPAK-L Package

### DPAK Package



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

Symbol	Description	Value	Units	
$V_{DS}$	Drain-Source Voltage	30	V	
$V_{GS}$	Gate-Source Voltage	$\pm 20$		
$I_D$	Continuous Drain Current @ $T_J=150^{\circ}C$ <sup>(a)</sup>	$\pm 52$	A	
$I_{DM}$	Pulsed Drain Current <sup>(a)</sup>	$\pm 56$		
$I_S$	Continuous Source Current (Source-Drain Diode) <sup>(a)</sup>	23		
$P_D$	Maximum Power Dissipation <sup>(a)</sup>	$T_A = 25^{\circ}C$	42	W
		$T_A = 70^{\circ}C$	27	
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 to 150	$^{\circ}C$	

Thermal Resistance			
$R_{\theta JA}$	Maximum Junction-to-Ambient <sup>(a)</sup>	96	$^{\circ}C/W$
$R_{\theta JC}$	Maximum Junction-to-Case <sup>(a)</sup>	3.6	$^{\circ}C/W$

## Advanced Analogic Technologies, Inc.

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6030LX.2001.05.0.91

Preliminary Information

### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

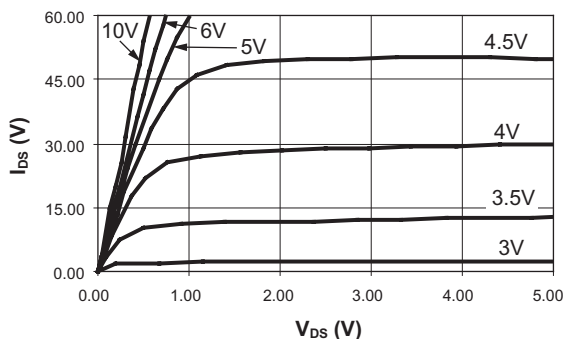
Symbol	Description	Conditions	Min	Typ	Max	Units
<b>DC Characteristics</b>						
B <sub>VDS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30			V
R <sub>DS(ON)</sub>	Drain-Source ON-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =10A		9.5	10.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		14	18	
I <sub>D(ON)</sub>	On-State Drain Current	V <sub>GS</sub> =10V, V <sub>DS</sub> =5V (Pulsed)	56			A
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA	1.0			V
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
I <sub>DSS</sub>	Drain Source Leakage Current	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V			1	μA
		V <sub>GS</sub> =0V, V <sub>DS</sub> =30V, T <sub>A</sub> =70°C			25	
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =15V, I <sub>D</sub> =10A		19		S
<b>Dynamic Characteristics</b>						
Q <sub>G</sub>	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =15A, V <sub>GS</sub> =10V		45	65	nC
Q <sub>GS</sub>	Gate-Source Charge			9		nC
Q <sub>GD</sub>	Gate-Drain Charge			7.5		nC
t <sub>D(ON)</sub>	Turn-ON Delay	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =15A, R <sub>G</sub> =6Ω		17	30	ns
t <sub>R</sub>	Turn-ON Rise Time			11	20	ns
t <sub>D(OFF)</sub>	Turn-OFF Delay			60	100	ns
t <sub>F</sub>	Turn-OFF Fall Time			45	80	ns
<b>Source-Drain Diode Characteristics</b>						
V <sub>SD</sub>	Source-Drain Forward Voltage	V <sub>GS</sub> =0, I <sub>S</sub> =28A		1	1.5	V
I <sub>S</sub>	Continuous Diode Current				23	A

#### Notes:

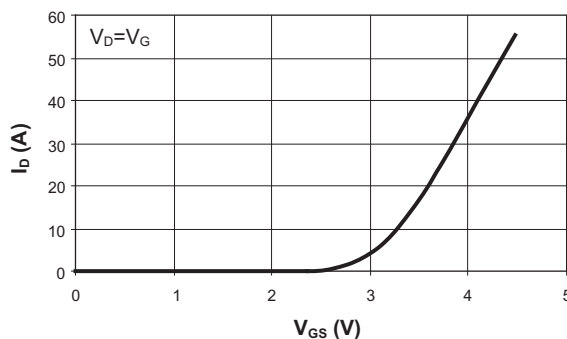
- Based on thermal dissipation from junction to case. R<sub>θJC</sub> + R<sub>θCA</sub> = R<sub>θJA</sub> where the case thermal reference is defined as the solder mounting surface of the drain pins. R<sub>θJC</sub> is guaranteed by design, however R<sub>θCA</sub> is determined by the PCB design. Package current is limited to 28A DC.
- With minimum copper pads on 1 x 1 inch FR4 board.

### Typical Characteristics

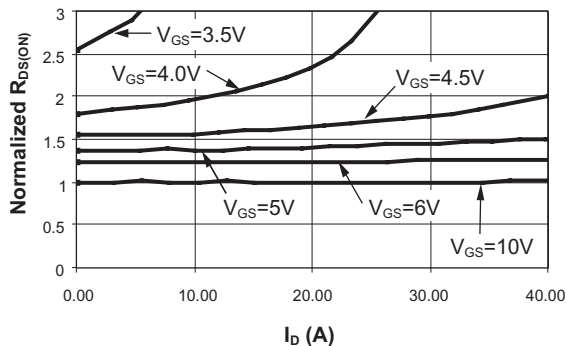
Output Characteristics



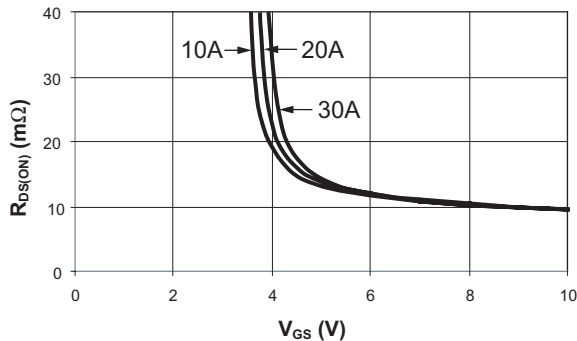
Transfer Characteristics



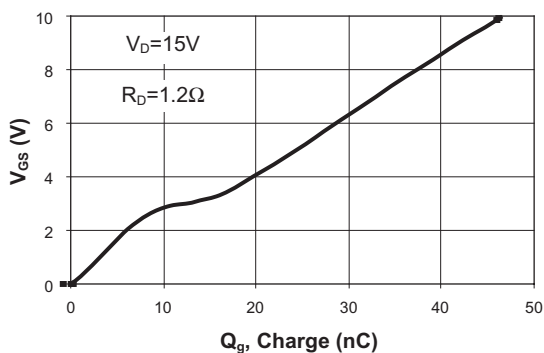
Normalized On-Resistance vs. Drain Current



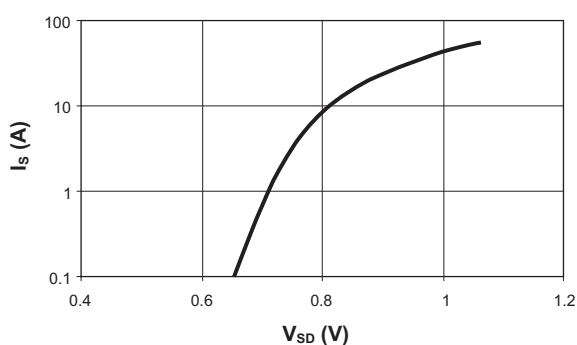
On-Resistance vs. Gate to Source Voltage



Gate Charge



Source-Drain Diode Forward Voltage

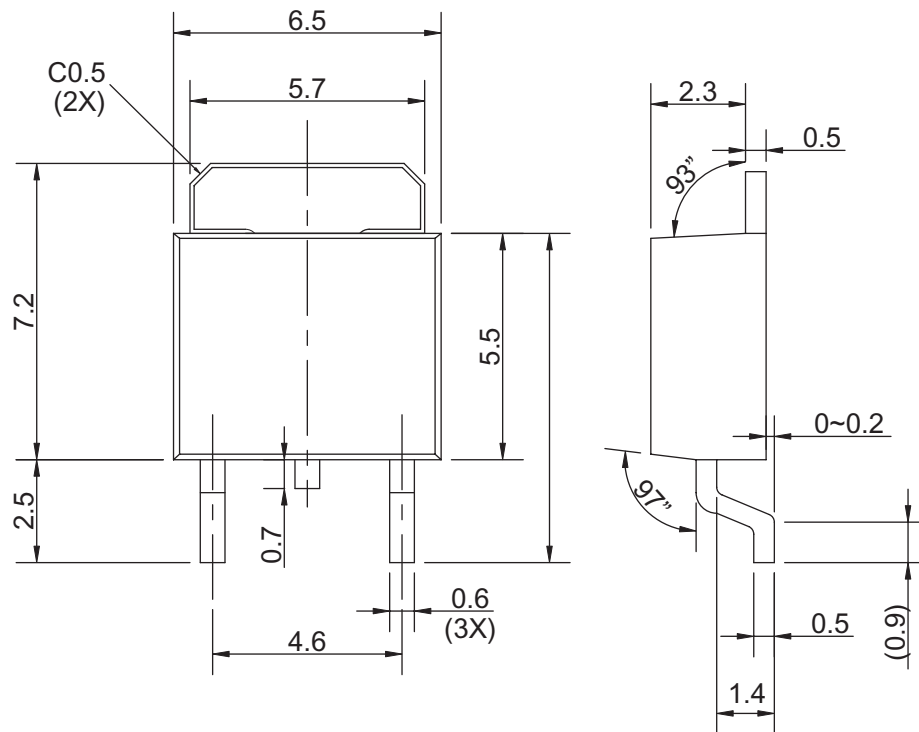


### Ordering Information

Package	Marking	Part Number			
		Bulk	MPQ	Tape and Reel	MPQ
TO-252 (DPAK)	6030LX	N/A	N/A	AHK6030LXINY-T1	2100

### Package Information

#### TO-252 (DPAK)



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