AHK6030LX

30V N-Channel Power MOSFET

General Description

Utilizing Analogic Tech's state-of-the-art TrenchDMOS® 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.

Features

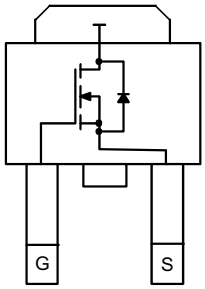
PWMSwitch™

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

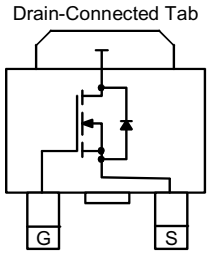
Applications

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

DPAK-L Package



DPAK Package



Preliminary Information

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

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

Thermal Resistance			
$R_{\theta JA}$	Maximum Junction-to-Ambient [(a)]	96	°C/W
$R_{\theta JC}$	Maximum Junction-to-Case[(a)]	3.6	°C/W

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Electrical Characteristics (TJ=25°C unless otherwise noted)

Symbol	Description	Conditions	Min	Typ	Max	Units
DC Characteristics						
BV_{DS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250µA	30			V
$R_{DS(ON)}$	Drain-Source ON-Resistance	V_{GS}=10V, I_D=10A		9.5	10.5	mΩ
		V_{GS}=4.5V, I_D=5A		14	18	
$I_{D(ON)}$	On-State Drain Current	V_{GS}=10V ,V_{DS}=5V (Pulsed)	56			A
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250µA	1.0			V
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
I_{DSS}	Drain Source Leakage Current	V_{GS}=0V,V_{DS}=30V			1	µA
		V_{GS}=0V,V_{DS}=30V, T_A=70°C			25	
g_{fs}	Forward Transconductance	VDS=15V, ID=10A		19		S
Dynamic Characteristics						
Q_G	Total Gate Charge	V_{DS}=15V, I_D=15A, V_{GS}=10V		45	65	nC
Q_{GS}	Gate-Source Charge			9		nC
Q_{GD}	Gate-Drain Charge			7.5		nC
$t_{D(ON)}$	Turn-ON Delay	V_{DD}=15V, V_{GS}=10V, I_D=15A, R_G=6Ω		17	30	ns
t_R	Turn-ON Rise Time			11	20	ns
$t_{D(OFF)}$	Turn-OFF Delay			60	100	ns
t_F	Turn-OFF Fall Time			45	80	ns
Source-Drain Diode Characteristics						
V_{SD}	Source-Drain Forward Voltage	V_{GS}=0, I_S=28A		1	1.5	V
I_S	Continuous Diode Current				23	A

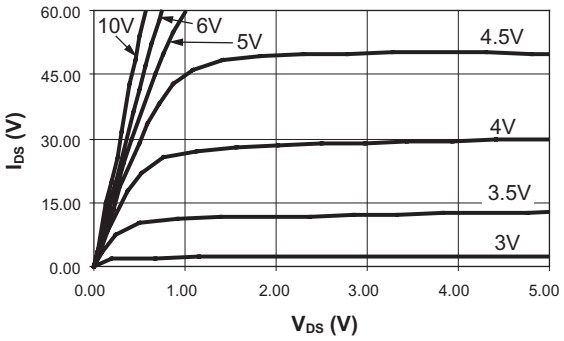
Notes:

(a) Based on thermal dissipation from junction to case. $R_{\theta JC}$ + $R_{\theta CA}$ = $R_{\theta JA}$ where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, however $R_{\theta CA}$ is determined by the PCB design. Package current is limited to 28A DC.

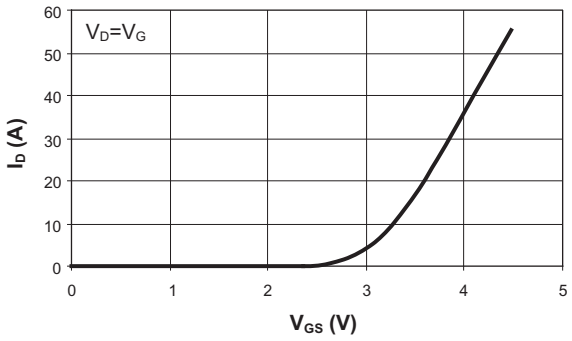
(b) With minimum copper pads on 1 x 1 inch FR4 board.

Typical Characteristics

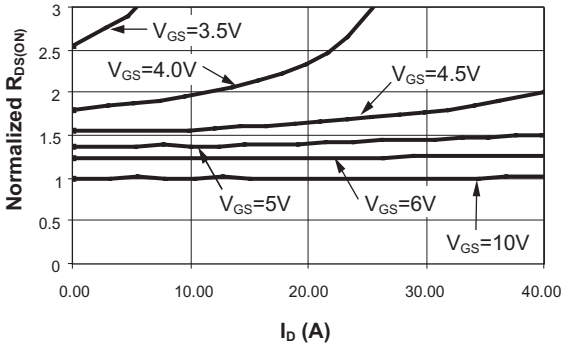
Output Characteristics



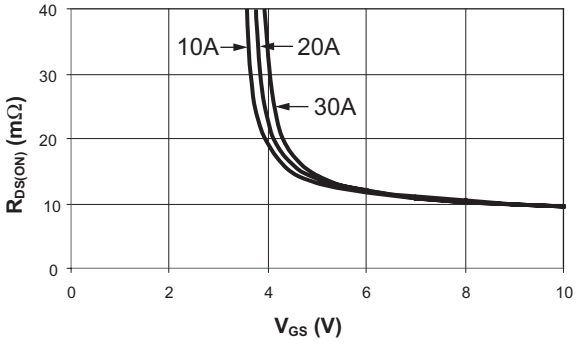
Transfer Characteristics



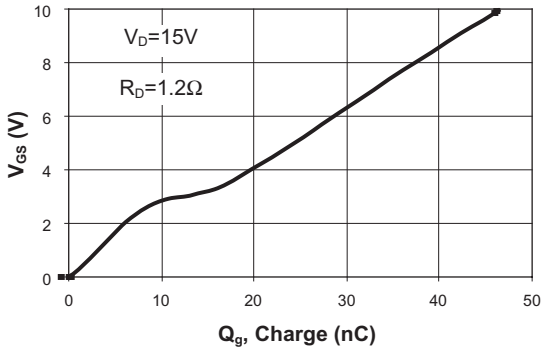
Normalized On-Resistance vs. Drain Current



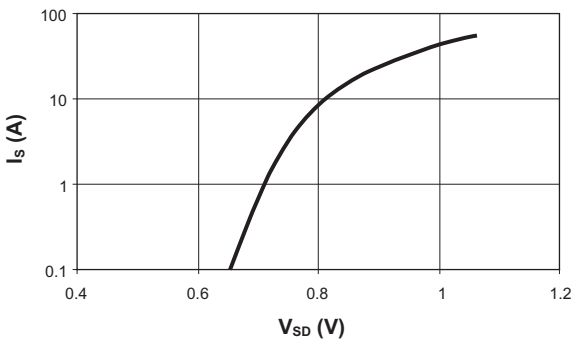
On-Resistance vs. Gate to Source Voltage



Gate Charge



Source-Drain Diode Forward Voltage



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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)