

# N-CHANNEL LATERAL POWER MOSFET FOR AUDIO

## ALF08N16K/ALF08N20K

- Designed specifically for linear audio amplifier applications
- High-speed for high bandwidth amplifiers
- High voltage rating – 160V & 200V
- TO-3 metal package
- Enhanced oscillation suppression in multi-device applications
- Complimentary P-channel available – ALF08P16K/ALF08P20K



## ABSOLUTE MAXIMUM RATINGS

(T<sub>C</sub> = 25°C unless otherwise stated)

|                  |                                                         | ALF08N16K     | ALF08N20K |
|------------------|---------------------------------------------------------|---------------|-----------|
| V <sub>DSS</sub> | Drain - Source Voltage                                  | 160V          | 200V      |
| V <sub>GSS</sub> | Gate - Source Voltage                                   | ±20V          |           |
| I <sub>D</sub>   | Continuous Drain Current                                | 8A            |           |
| I <sub>DR</sub>  | Body Drain Diode Current                                | 8A            |           |
| P <sub>D</sub>   | Allowable Power Dissipation    T <sub>case</sub> = 25°C | 125W          |           |
| T <sub>ch</sub>  | Channel Temperature                                     | 150°C         |           |
| T <sub>stg</sub> | Storage Temperature Range                               | -55 to +150°C |           |

## THERMAL PROPERTIES

| Symbols          | Parameters                           | Min. | Typ. | Max. | Units |
|------------------|--------------------------------------|------|------|------|-------|
| R <sub>θJC</sub> | Thermal Resistance, Junction To Case |      |      | 1    | °C/W  |

Magnatec reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Magnatec is believed to be both accurate and reliable at the time of going to press. However Magnatec assumes no responsibility for any errors or omissions discovered in its use. Magnatec encourages customers to verify that datasheets are current before placing orders.

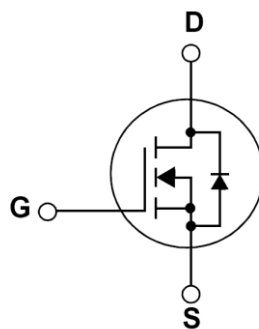
## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise stated)

| Symbols        | Parameters                      | Test Conditions                                                                                      |                        | Min.       | Typ | Max.     | Units         |
|----------------|---------------------------------|------------------------------------------------------------------------------------------------------|------------------------|------------|-----|----------|---------------|
| $BV_{DSX}$     | Drain-Source Breakdown Voltage  | $V_{GS} = -10\text{V}$<br>$I_D = 10\text{mA}$                                                        | ALF08N16K<br>ALF08N20K | 160<br>200 |     |          | V             |
| $I_{GSS}$      | Gate-Source Leakage Current     | $V_{DS} = 0$<br>$V_{GS} = \pm 20\text{V}$                                                            |                        |            |     | 100      | $\mu\text{A}$ |
| $V_{GS(off)}$  | Gate-Source Cut-off Voltage     | $V_{DS} = 10\text{V}$<br>$I_D = 100\text{mA}$                                                        |                        | 0.15       |     | 1.5      | V             |
| $V_{DS(sat)*}$ | Drain-Source Saturation Voltage | $V_{GD} = 0$<br>$I_D = 8\text{A}$                                                                    |                        |            |     | 12       | V             |
| $ y_{fs} ^*$   | Forward Transfer Admittance     | $V_{DS} = 10\text{V}$<br>$I_{DS} = 3\text{A}$                                                        |                        | 0.7        |     | 2        | S( $\Omega$ ) |
| $I_{DSX}$      | Drain-Source Cut-Off Current    | $V_{GS} = -10\text{V}$<br>$V_{DS} = 160\text{V}$<br>ALF08N16K<br>$V_{DS} = 200\text{V}$<br>ALF08N20K |                        |            |     | 10<br>10 | mA            |

\* Pulse Test: Pulse Width =  $300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

## DYNAMIC CHARACTERISTICS

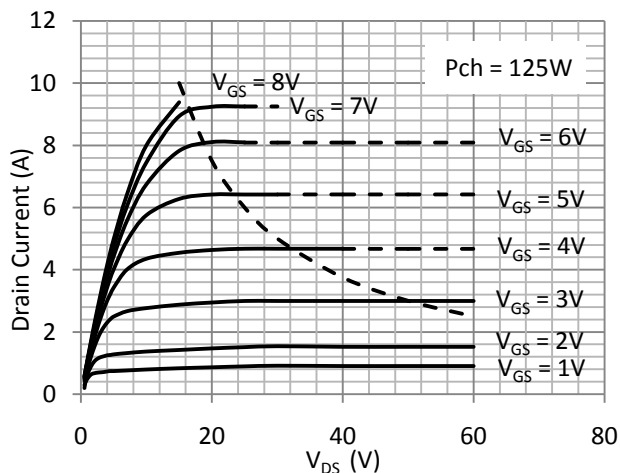
|           |                              |                       |  |     |  |    |
|-----------|------------------------------|-----------------------|--|-----|--|----|
| $C_{iss}$ | Input Capacitance            | $V_{GS} = 0$          |  | 500 |  | pF |
| $C_{oss}$ | Output Capacitance           | $V_{DS} = 10\text{V}$ |  | 300 |  |    |
| $C_{rss}$ | Reverse Transfer Capacitance | $f = 1.0\text{MHz}$   |  | 10  |  |    |
| $t_{on}$  | Turn-On Time                 | $V_{DS} = 20\text{V}$ |  | 100 |  | ns |
| $t_{off}$ | Turn-Off Time                | $I_D = 5\text{A}$     |  | 50  |  |    |



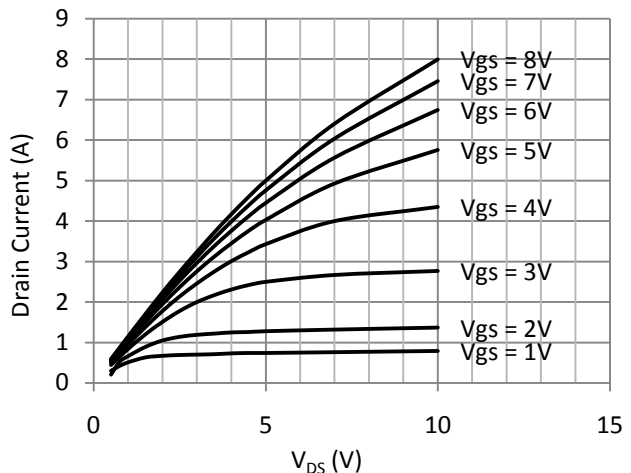
Please Note: These lateral mosfets do not include a G-S protection network and care must therefore be taken with static handling precautions and the appropriate protection in the amplifier circuit. Please refer to the application notes for more information.

## GENERAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise stated)

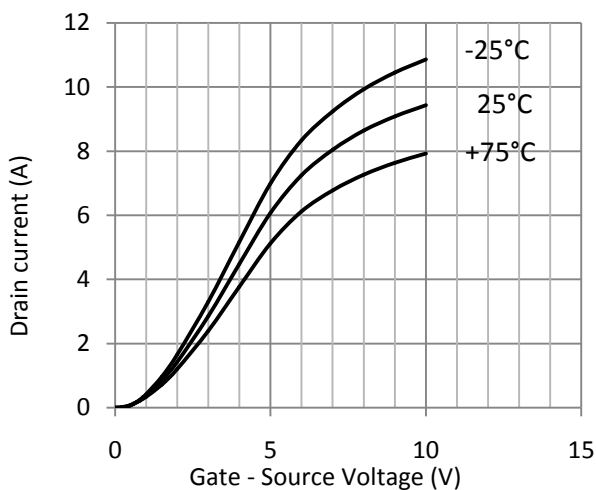
Typical Output Characteristics



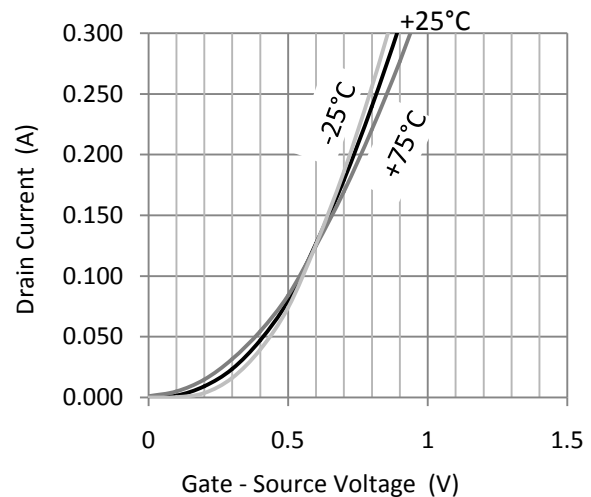
Typical Output Characteristics



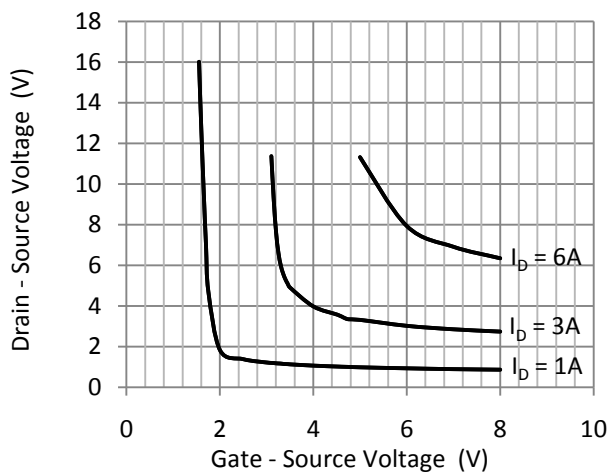
Transfer Characteristic



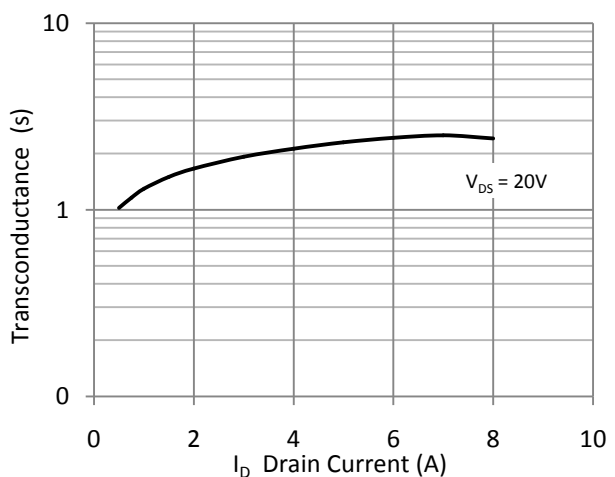
Transfer Characteristic

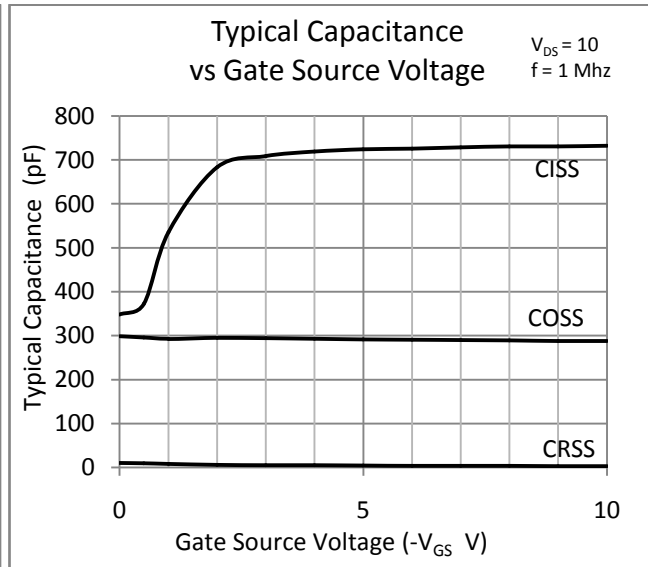
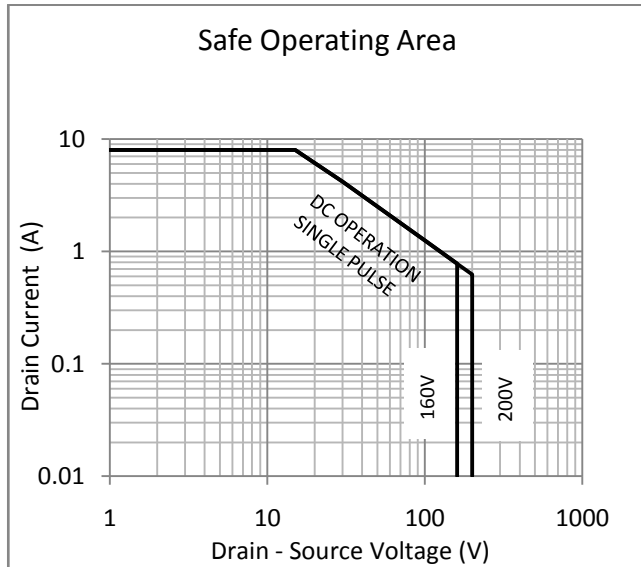


Drain - Source Voltage  
vs Gate - Source Voltage

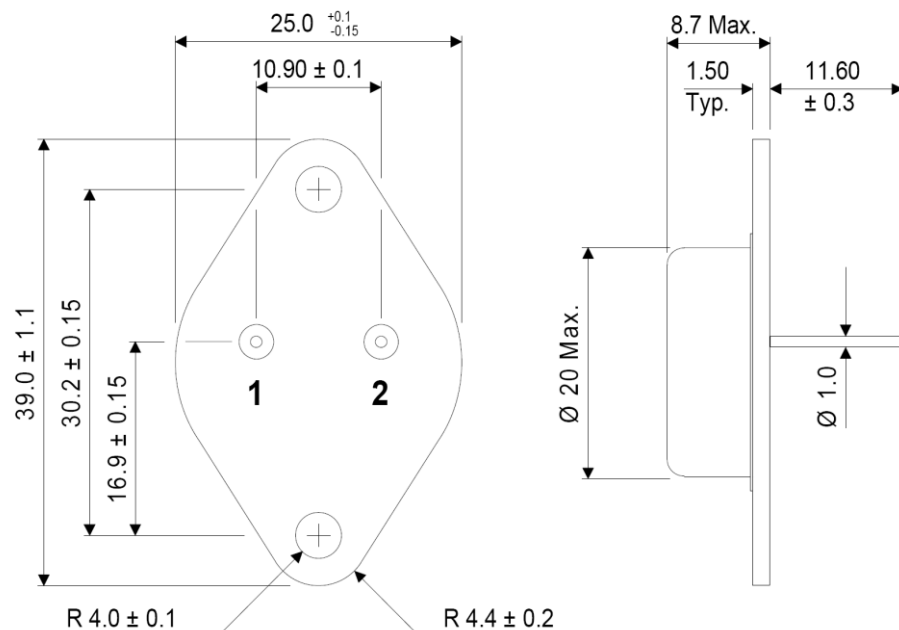


Transconductance



**GENERAL CHARACTERISTICS CONTINUED** ( $T_C = 25^\circ\text{C}$  unless otherwise stated)

**MECHANICAL DATA**

Dimensions in mm


**TO-3**

Pin 1 – Gate

Pin 2 – Drain

Case – Source