



# ACE4922

## Dual N-Channel Enhancement Mode MOSFET

### Description

The ACE4922 is the Dual N-Channel enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance and provide superior switching performance. These devices are particularly suited for low voltage applications such as notebook computer power management and other battery powered circuits where high-side switching, low in-line power loss, and resistance to transients are needed.

### Features

- N-Channel  
20V/0.95A,  $R_{DS(ON)}=380m\Omega@V_{GS}=4.5V$   
20V/0.75A,  $R_{DS(ON)}=450m\Omega@V_{GS}=2.5V$   
20V/0.65A,  $R_{DS(ON)}=800m\Omega@V_{GS}=1.8V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

### Application

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

### Absolute Maximum Ratings

| Parameter                                      | Symbol    | Max              | Unit       |   |
|--|-----------|------------------|------------|---|
| Drain-Source Voltage                           | $V_{DSS}$ | 20               | V          |   |
| Gate-Source Voltage                            | $V_{GSS}$ | $\pm 20$         | V          |   |
| Continuous Drain Current ( $T_J=150^\circ C$ ) | $I_D$     | $T_A=25^\circ C$ | 1.2        | A |
|  |           | $T_A=80^\circ C$ | 0.9        |   |
| Pulsed Drain Current                           | $I_{DM}$  | 4                | A          |   |
| Continuous Source Current (Diode Conduction)   | $I_S$     | 0.6              | A          |   |
| Power Dissipation                              | $P_D$     | $T_A=25^\circ C$ | 0.35       | W |
|  |           | $T_A=70^\circ C$ | 0.19       |   |
| Operating Junction Temperature                 | $T_J$     | -55/150          | $^\circ C$ |   |
| Storage Temperature Range                      | $T_{STG}$ | -55/150          | $^\circ C$ |   |

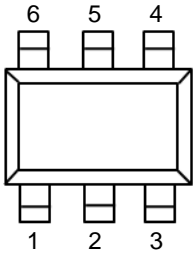


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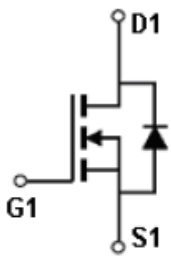
## Dual N-Channel Enhancement Mode MOSFET

### Packaging Type

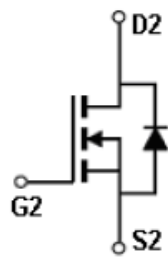
SC-70-6



| SC-70-6 | Description |
|---------|-------------|
| 1       | Source 1    |
| 2       | Gate 1      |
| 3       | Drain 2     |
| 4       | Source 2    |
| 5       | Gate 2      |
| 6       | Drain 1     |



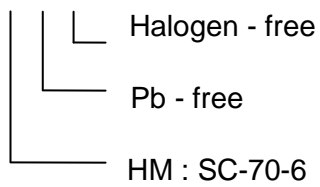
N-Channel



N-Channel

### Ordering information

ACE4922 XX + H





### Electrical Characteristics

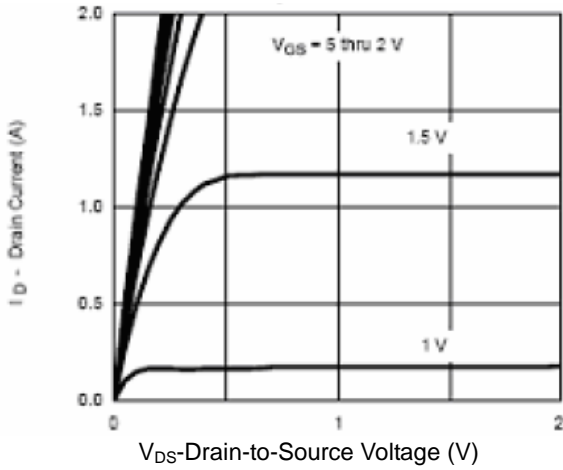
T<sub>A</sub>=25°C, unless otherwise noted.

| Parameter                       | Symbol               | Conditions   | Min. | Typ. | Max. | Unit |
|---------------------------------|----------------------|--|------|------|------|------|
| Static                          |                      |  |      |      |      |      |
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =250 uA  | 20   |      |      | V    |
| Gate Threshold Voltage          | V <sub>GS(th)</sub>  | V <sub>D</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA  | 0.35 |      | 1.0  |      |
| Gate Leakage Current            | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V   |      |      | 100  | nA   |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>     | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V  |      |      | 1    | uA   |
|                                 |                      | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C   |      |      | 5    |      |
| On-State Drain Current          | I <sub>D(ON)</sub>   | V <sub>DS</sub> ≥ 4.5V, V <sub>GS</sub> =5V  | 0.7  |      |      | A    |
| Drain-Source On-Resistance      | R <sub>DS(ON)</sub>  | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.95A   |      | 0.26 | 0.38 | Ω    |
|                                 |                      | V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.75A   |      | 0.32 | 0.45 |      |
|                                 |                      | V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.65A   |      | 0.42 | 0.80 |      |
| Forward Transconductance        | g <sub>fs</sub>      | V <sub>DS</sub> =10V, I <sub>D</sub> =0.4A   |      | 1.0  |      | S    |
| Diode Forward Voltage           | V <sub>SD</sub>      | I <sub>S</sub> =0.15A, V <sub>GS</sub> =0V   |      | 0.8  | 1.2  | V    |
| Dynamic                         |                      |  |      |      |      |      |
| Total Gate Charge               | Q <sub>g</sub>       | V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.6A  |      | 1.2  | 1.5  | nC   |
| Gate-Source Charge              | Q <sub>gs</sub>      |  |      | 0.2  |      |      |
| Gate-Drain Charge               | Q <sub>gd</sub>      |  |      | 0.3  |      |      |
| Turn-On Time                    | td(on)               | V <sub>DD</sub> =10V, R <sub>L</sub> =10Ω, I <sub>D</sub> =0.5A,<br>V <sub>GEN</sub> =4.5V, R <sub>G</sub> =6Ω |      | 5    | 10   | nS   |
|                                 | tr                   |  |      | 8    | 15   |      |
| Turn-Off Time                   | td(off)              |  |      | 10   | 18   |      |
|                                 | tf                   |  |      | 1.2  | 2.8  |      |

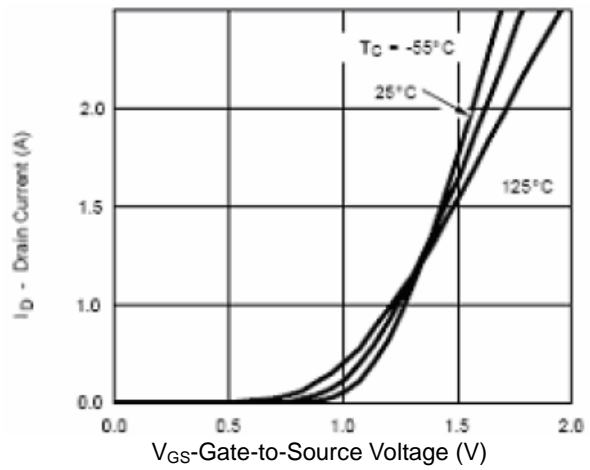


Typical Performance Characteristics

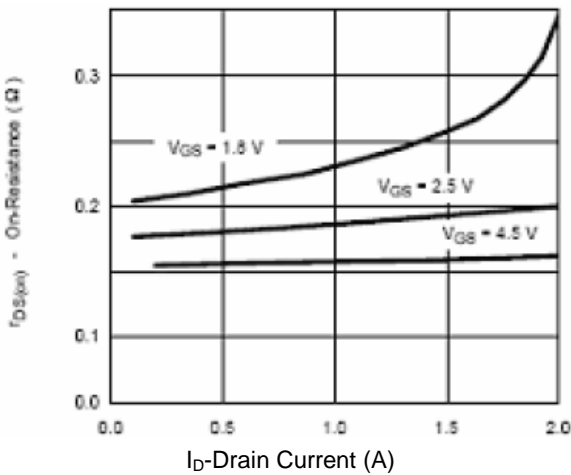
Output Characteristics



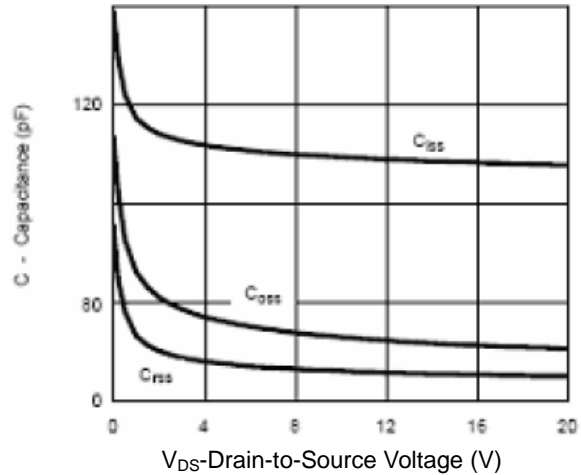
Transfer Characteristics



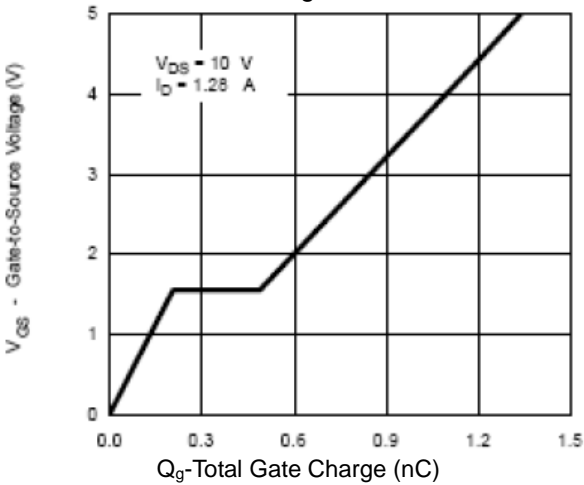
On-Resistance vs. Drain Current



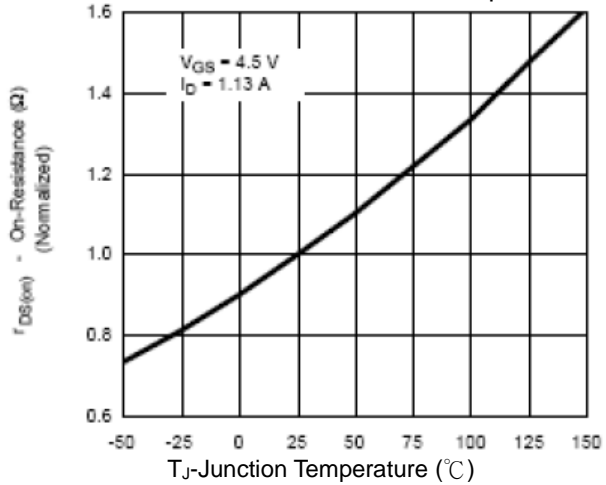
Capacitance



Gate Charge



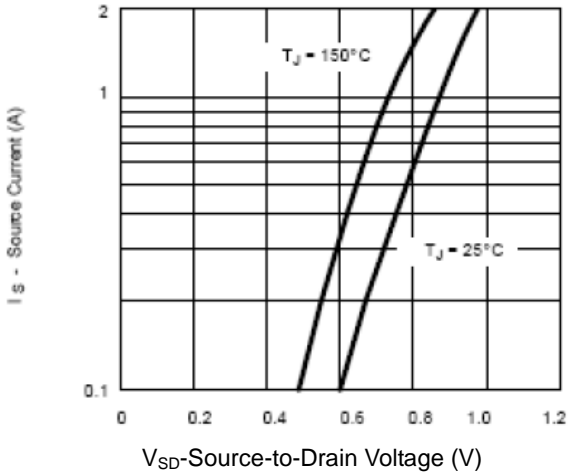
On-Resistance vs. Junction Temperature



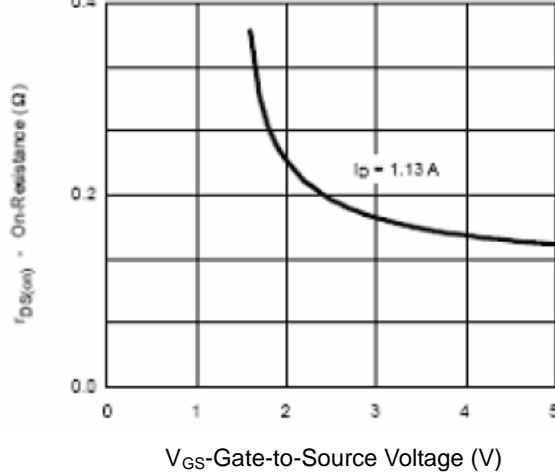


Typical Performance Characteristics

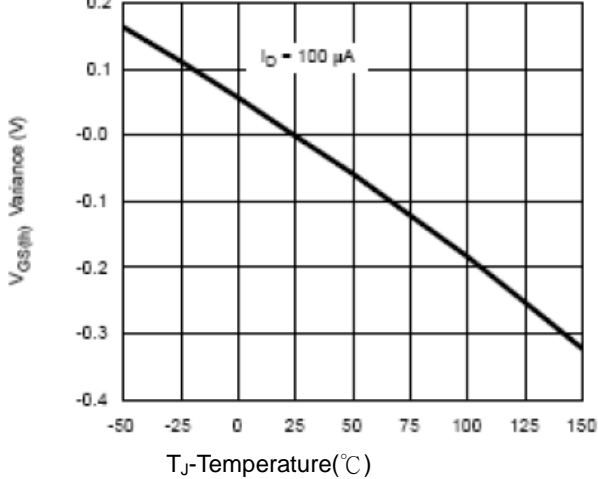
Source-Drain Diode Forward Voltage



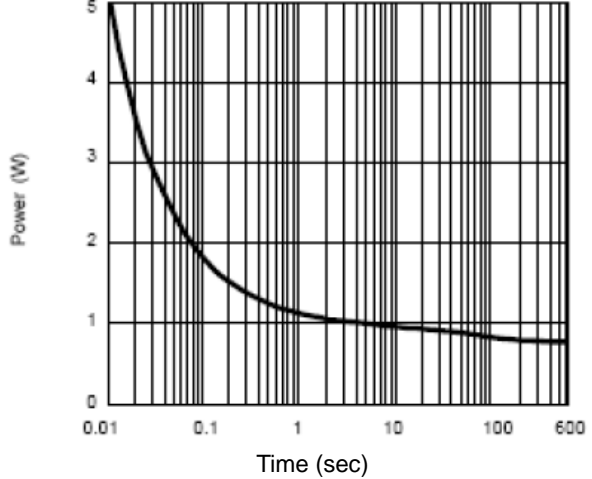
On-Resistance vs. Gate-to-Source Voltage



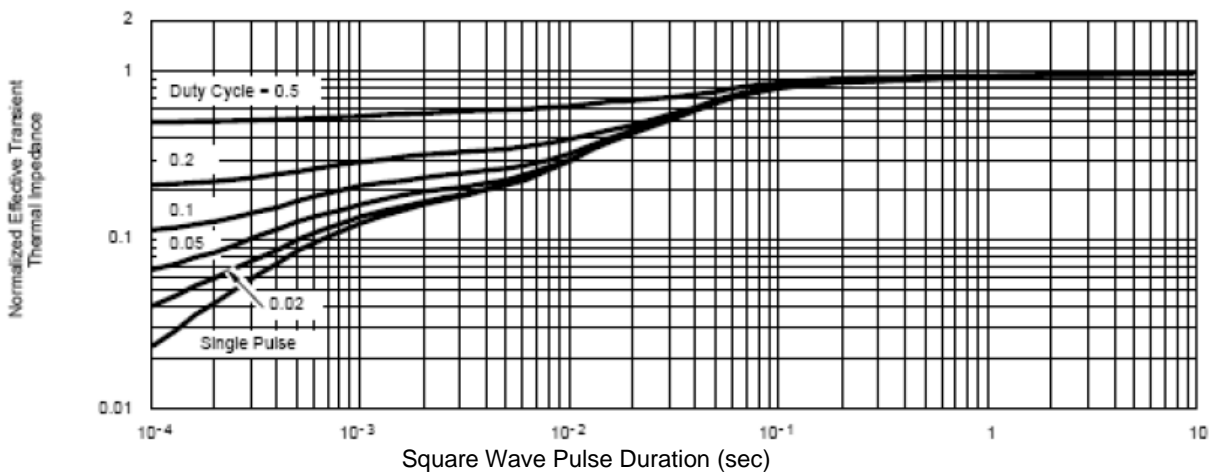
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



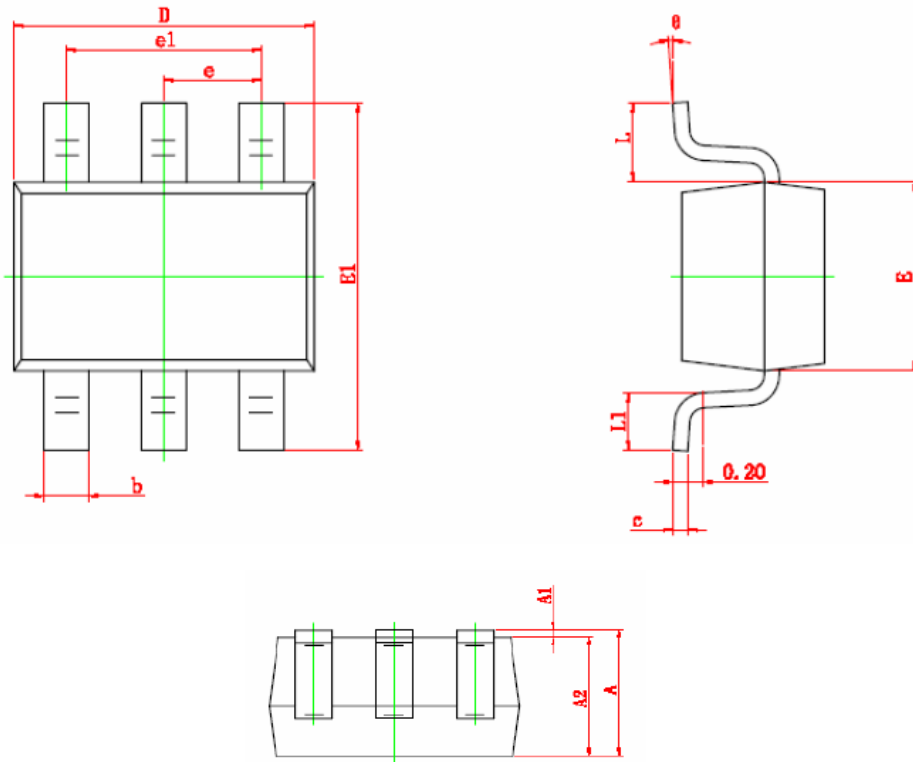
Normalized Thermal Transient Impedance, Junction-to-Foot





Packing Information

SC-70-6



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.100 | 0.035                | 0.043 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.000 | 0.035                | 0.039 |
| b      | 0.150                     | 0.350 | 0.006                | 0.014 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.000                     | 2.200 | 0.079                | 0.087 |
| E      | 1.150                     | 1.350 | 0.045                | 0.053 |
| E1     | 2.150                     | 2.450 | 0.085                | 0.096 |
| e      | 0.650 TYP                 |       | 0.026 TYP            |       |
| e1     | 1.200                     | 1.400 | 0.047                | 0.055 |
| L      | 0.525 REF                 |       | 0.021 REF            |       |
| L1     | 0.260                     | 0.460 | 0.010                | 0.018 |
| theta  | 0°                        | 8°    | 0°                   | 8°    |



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### Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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