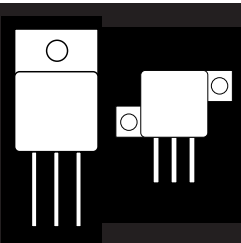


# POWER MOSFETS IN HERMETIC ISOLATED JEDEC TO-254AA SIZE 6 DIE



400V, 500V, N-Channel, Up To 24 Amp  
Size 6 MOSFETs, High Energy Capability

## FEATURES

- Isolated Hermetic Metal Package
- Size 6 Die, High Energy
- Fast Switching, Low Drive Current
- Ease of Paralleling For Added Power
- Low  $R_{DS(on)}$
- Available Screened To MIL-S-19500, TX, TXV And S Levels

## DESCRIPTION

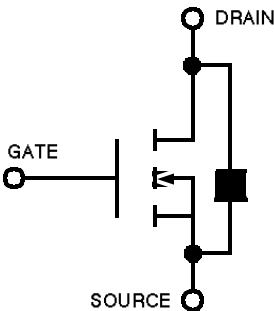
This series of hermetically packaged products feature the latest advanced MOSFET and packaging technology. They are ideally suited for Military requirements where small size, high performance and high reliability are required, and in applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers and high energy pulse circuits. This series also features avalanche high energy capability at elevated temperatures.

## MAXIMUM RATINGS

| PART NUMBER | $V_{DS}$ | $R_{DS(on)}$ | $I_D$ (Amp) |
|-------------|----------|--------------|-------------|
| OM6025SA    | 400      | .23          | 24          |
| OM6026SA    | 500      | .30          | 22          |

3.1

## SCHEMATIC



## OM6025SA - OM6026SA

### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

|                                | Parameter                                                   | OM6025SA   | OM6026SA   | Units               |
|--------------------------------|-------------------------------------------------------------|------------|------------|---------------------|
| $V_{DS}$                       | Drain-Source Voltage                                        | 400        | 500        | V                   |
| $V_{DGR}$                      | Drain-Gate Voltage ( $R_{GS} = 1\text{ M } \Omega$ )        | 400        | 500        | V                   |
| $I_D @ T_C = 25^\circ\text{C}$ | Continuous Drain Current <sup>2</sup>                       | 24         | 22         | A                   |
| $I_{DM}$                       | Pulsed Drain Current <sup>2</sup>                           | 92         | 85         | A                   |
| $P_D @ T_C = 25^\circ\text{C}$ | Maximum Power Dissipation                                   | 165        | 165        | W                   |
|                                | Derate Above $25^\circ\text{C}$ Ambient                     | .025       | .025       | W/ $^\circ\text{C}$ |
| $W_{DSS} (1) (2)$              | Single Pulse Energy<br>Drain To Source @ $25^\circ\text{C}$ | 1000       | 1200       | mJ                  |
| $T_J$                          | Operating and                                               |            |            |                     |
| $T_{stg}$                      | Storage Temperature Range                                   | -55 to 150 | -55 to 150 | $^\circ\text{C}$    |
| Lead Temperature               | (1/8" from case for 5 secs.)                                | 275        | 275        | $^\circ\text{C}$    |

**Note 1:**  $V_{DD} = 50\text{V}$ ,  $I_D = \text{as noted}$

**Note 2:** Package Pin Limitation  $I_D @ T_C = 25^\circ\text{C} = 25\text{ Amps}$

### THERMAL RESISTANCE (MAXIMUM) at $T_A = 25^\circ\text{C}$

|            |                                      |      |                     |                    |
|------------|--------------------------------------|------|---------------------|--------------------|
| $R_{thJC}$ | Junction-to-Case                     | .76  | $^\circ\text{C/W}$  |                    |
| $R_{thJA}$ | Junction-to-Ambient                  | 40   | $^\circ\text{C/W}$  | Free Air Operation |
|            | Derate Above $25^\circ\text{C}$ Case | 1.32 | W/ $^\circ\text{C}$ |                    |

ELECTRICAL CHARACTERISTICS: OM6026SA (T<sub>C</sub> = 25° unless otherwise noted)

| Characteristic                                                                                   | Symbol               | Min. | Typ. | Max. | Unit             |
|--------------------------------------------------------------------------------------------------|----------------------|------|------|------|------------------|
| <b>OFF CHARACTERISTICS</b>                                                                       |                      |      |      |      |                  |
| Drain-Source Breakdown Voltage (V <sub>GS</sub> = 0, I <sub>D</sub> = 0.25 mA)                   | V <sub>(BR)DSS</sub> | 500  | -    | -    | V <sub>dc</sub>  |
| Zero Gate Voltage Drain<br>(V <sub>DS</sub> = 500 V, V <sub>GS</sub> = 0)                        | I <sub>BSS</sub>     | -    | -    | 0.25 | nA <sub>dc</sub> |
| (V <sub>DS</sub> = 500 V, V <sub>GS</sub> = 0, T <sub>J</sub> = 125° C)                          |                      | -    | -    | 1.0  | nA <sub>dc</sub> |
| Gate-Body Leakage Current, Forward (V <sub>GSF</sub> = 20 V <sub>dc</sub> , V <sub>DS</sub> = 0) | I <sub>GSSF</sub>    | -    | -    | 100  | nA <sub>dc</sub> |
| Gate-Body Leakage Current, Reverse (V <sub>GSR</sub> = 20 V <sub>dc</sub> , V <sub>DS</sub> = 0) | I <sub>GSSR</sub>    | -    | -    | 100  | nA <sub>dc</sub> |

**ON CHARACTERISTICS\***

|                                                                                                                                    |                     |            |          |            |                  |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------|----------|------------|------------------|
| Gate-Threshold Voltage<br>(V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 0.25 mA <sub>dc</sub><br>(T <sub>J</sub> = 125° C) | V <sub>GS(th)</sub> | 2.0<br>1.5 | 3.0<br>- | 4.0<br>3.5 | V <sub>dc</sub>  |
| Static Drain-Source On-Resistance (V <sub>GS</sub> = 10 V <sub>dc</sub> , I <sub>D</sub> = 11 A <sub>dc</sub> )                    | r <sub>DS(on)</sub> | -          | -        | 0.30       | Ohm              |
| Drain-Source On-Voltage (V <sub>GS</sub> = 10 V <sub>dc</sub> )<br>(I <sub>D</sub> = 22 A)                                         | V <sub>DS(on)</sub> | -          | -        | 8.0        | V <sub>dc</sub>  |
| (I <sub>D</sub> = 11 A, T <sub>J</sub> = 125° C)                                                                                   |                     | -          | -        | 8.0        | mV <sub>os</sub> |
| Forward Transconductance (V <sub>DS</sub> = 15 V <sub>dc</sub> , I <sub>D</sub> = 11 A <sub>dc</sub> )                             | g <sub>FS</sub>     | 11         | -        | -          | mhos             |

**DYNAMIC CHARACTERISTICS**

|                                                                                    |                  |   |      |   |    |
|------------------------------------------------------------------------------------|------------------|---|------|---|----|
| Input Capacitance<br>(V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0,<br>f = 1.0 MHz) | C <sub>iss</sub> | - | 5600 | - | pF |
| Output Capacitance                                                                 | C <sub>oss</sub> | - | 680  | - | -  |
| Transfer Capacitance                                                               | C <sub>rss</sub> | - | 200  | - | -  |

**SWITCHING CHARACTERISTICS**

|                                                                                                                                  |                     |   |     |     |    |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------|---|-----|-----|----|
| Turn-On Delay Time<br>(V <sub>DD</sub> = 250 V, I <sub>D</sub> = 22 A,<br>R <sub>gth</sub> = 4.3 ohms)<br>V <sub>GS</sub> = 10 V | t <sub>d(on)</sub>  | - | 70  | -   | ns |
| Rise Time                                                                                                                        | t <sub>r</sub>      | - | 190 | -   | -  |
| Turn-Off Delay Time                                                                                                              | t <sub>d(off)</sub> | - | 160 | -   | -  |
| Fall Time                                                                                                                        | t <sub>f</sub>      | - | 160 | -   | -  |
| Total Gate Charge<br>(V <sub>DS</sub> = 400 V, I <sub>D</sub> = 22 A,<br>V <sub>GS</sub> = 10 V)                                 | Q <sub>g</sub>      | - | 115 | 140 | nC |
| Gate-Source Charge                                                                                                               | Q <sub>gs</sub>     | - | 20  | -   | -  |
| Gate-Drain Charge                                                                                                                | Q <sub>gd</sub>     | - | 60  | -   | -  |

**SOURCE DRAIN DIODE CHARACTERISTICS**

|                                                                 |                 |   |     |      |                 |
|-----------------------------------------------------------------|-----------------|---|-----|------|-----------------|
| Forward On-Voltage<br>(I <sub>S</sub> = 22 A, dI/dt = 100 A/μs) | V <sub>SD</sub> | - | 1.1 | 1.6  | V <sub>dc</sub> |
| Forward Turn-On Time                                            | t <sub>on</sub> | - | **  | -    | ns              |
| Reverse Recovery Time                                           | t <sub>rr</sub> | - | 500 | 1000 | -               |

\* Indicates Pulse Test = 300 μsec, Duty Cycle = 2%

\*\* Limited by circuit inductance

ELECTRICAL CHARACTERISTICS: OM6025SA (T<sub>C</sub> = 25° unless otherwise noted)

| Characteristic                                                                                   | Symbol               | Min. | Typ. | Max. | Unit             |
|--------------------------------------------------------------------------------------------------|----------------------|------|------|------|------------------|
| <b>OFF CHARACTERISTICS</b>                                                                       |                      |      |      |      |                  |
| Drain-Source Breakdown Voltage (V <sub>GS</sub> = 0, I <sub>D</sub> = 0.25 mA)                   | V <sub>(BR)DSS</sub> | 400  | -    | -    | V <sub>dc</sub>  |
| Zero Gate Voltage Drain<br>(V <sub>DS</sub> = 400 V, V <sub>GS</sub> = 0)                        | I <sub>BSS</sub>     | -    | -    | 0.25 | nA <sub>dc</sub> |
| (V <sub>DS</sub> = 400 V, V <sub>GS</sub> = 0, T <sub>J</sub> = 125° C)                          |                      | -    | -    | 1.0  | nA <sub>dc</sub> |
| Gate-Body Leakage Current, Forward (V <sub>GSF</sub> = 20 V <sub>dc</sub> , V <sub>DS</sub> = 0) | I <sub>GSSF</sub>    | -    | -    | 100  | nA <sub>dc</sub> |
| Gate-Body Leakage Current, Reverse (V <sub>GSR</sub> = 20 V <sub>dc</sub> , V <sub>DS</sub> = 0) | I <sub>GSSR</sub>    | -    | -    | 100  | nA <sub>dc</sub> |

**ON CHARACTERISTICS\***

|                                                                                                                                    |                     |            |          |            |                  |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------|----------|------------|------------------|
| Gate-Threshold Voltage<br>(V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 0.25 mA <sub>dc</sub><br>(T <sub>J</sub> = 125° C) | V <sub>GS(th)</sub> | 2.0<br>1.5 | 3.0<br>- | 4.0<br>3.5 | V <sub>dc</sub>  |
| Static Drain-Source On-Resistance (V <sub>GS</sub> = 10 V <sub>dc</sub> , I <sub>D</sub> = 12 A <sub>dc</sub> )                    | r <sub>DS(on)</sub> | -          | -        | 0.23       | Ohm              |
| Drain-Source On-Voltage (V <sub>GS</sub> = 10 V <sub>dc</sub> )<br>(I <sub>D</sub> = 24 A)                                         | V <sub>DS(on)</sub> | -          | -        | 5.6        | V <sub>dc</sub>  |
| (I <sub>D</sub> = 12 A, T <sub>J</sub> = 125° C)                                                                                   |                     | -          | -        | 5.6        | mV <sub>os</sub> |
| Forward Transconductance (V <sub>DS</sub> = 15 V <sub>dc</sub> , I <sub>D</sub> = 12 A <sub>dc</sub> )                             | g <sub>FS</sub>     | 14         | -        | -          | mhos             |

**DYNAMIC CHARACTERISTICS**

|                                                                                    |                  |   |      |   |    |
|------------------------------------------------------------------------------------|------------------|---|------|---|----|
| Input Capacitance<br>(V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0,<br>f = 1.0 MHz) | C <sub>iss</sub> | - | 5600 | - | pF |
| Output Capacitance                                                                 | C <sub>oss</sub> | - | 78   | - | -  |
| Transfer Capacitance                                                               | C <sub>rss</sub> | - | 230  | - | -  |

**SWITCHING CHARACTERISTICS**

|                                                                                                        |                     |   |     |     |    |
|--------------------------------------------------------------------------------------------------------|---------------------|---|-----|-----|----|
| Turn-On Delay Time<br>(V <sub>DD</sub> = 250 V, I <sub>D</sub> = 24 A,<br>R <sub>gth</sub> = 4.3 ohms) | t <sub>d(on)</sub>  | - | 70  | -   | ns |
| Rise Time                                                                                              | t <sub>r</sub>      | - | 190 | -   | -  |
| Turn-Off Delay Time                                                                                    | t <sub>d(off)</sub> | - | 160 | -   | -  |
| Fall Time                                                                                              | t <sub>f</sub>      | - | 160 | -   | -  |
| Total Gate Charge<br>(V <sub>DS</sub> = 400 V, I <sub>D</sub> = 24 A,<br>V <sub>GS</sub> = 10 V)       | Q <sub>g</sub>      | - | 110 | 140 | nC |
| Gate-Source Charge                                                                                     | Q <sub>gs</sub>     | - | 20  | -   | -  |
| Gate-Drain Charge                                                                                      | Q <sub>gd</sub>     | - | 55  | -   | -  |

**SOURCE DRAIN DIODE CHARACTERISTICS**

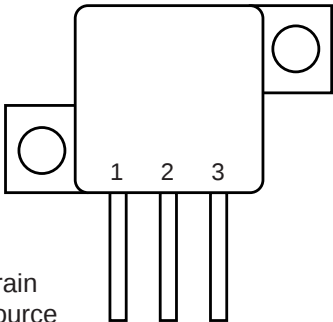
|                                                                 |                 |   |     |      |                 |
|-----------------------------------------------------------------|-----------------|---|-----|------|-----------------|
| Forward On-Voltage<br>(I <sub>S</sub> = 24 A, dI/dt = 100 A/μs) | V <sub>SD</sub> | - | 1.1 | 1.6  | V <sub>dc</sub> |
| Forward Turn-On Time                                            | t <sub>on</sub> | - | **  | -    | ns              |
| Reverse Recovery Time                                           | t <sub>rr</sub> | - | 500 | 1000 | -               |

OM6025SA - OM6026SA

3.1

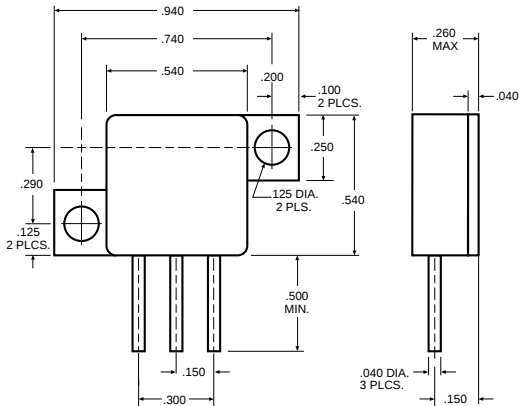
OM6025SC - OM6026SC

PIN CONNECTION

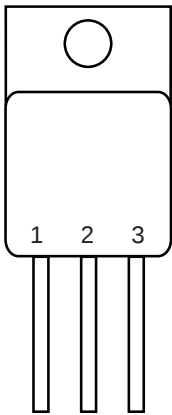


Pin 1: Drain  
Pin 2: Source  
Pin 3: Gate

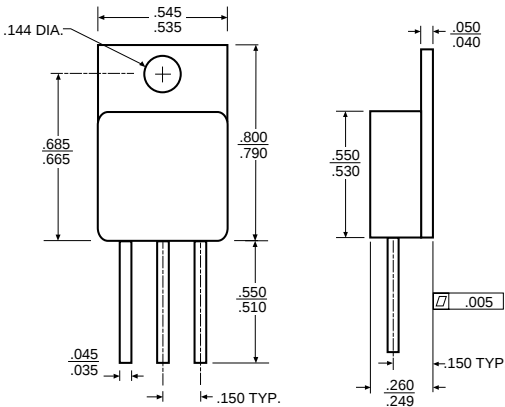
MECHANICAL OUTLINE



M-3S

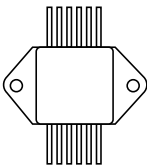


Pin 1: Drain  
Pin 2: Source  
Pin 3: Gate

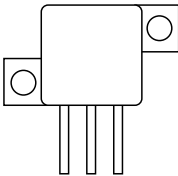


M-PAK

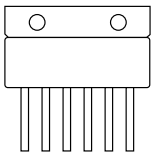
PACKAGE OPTIONS



MOD PAK



Z-TAB



6 PIN SIP

- NOTES:**
- Standard Products are supplied with glass feedthroughs. For ceramic feedthroughs, add the letter "C" to the part number. Example - OMXXXXCSA.
  - MOSFETs are also available in Z-Tab, dual and quad pak styles - Please call the factory for more information.