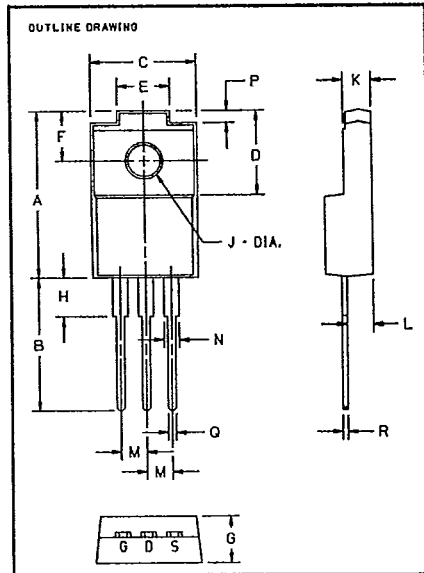


**POWEREX**

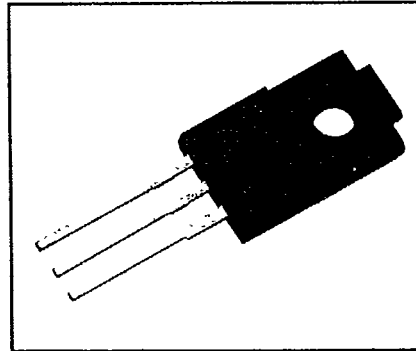
98 DE 7294621 0002715 6

**J846****Tentative**

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

**Single EXMOS™  
MOSFET****3 Amperes/900 Volts****900 Volts J846  
Outline Drawing**

| Dimension | Inches             | Millimeters     |
|-----------|--------------------|-----------------|
| A         | .669 ± .012        | 17 ± 0.3        |
| B         | .531 Min.          | 13.5 Min.       |
| C         | .413 Max.          | 10.5 Max.       |
| D         | .335 ± .012        | 8.5 ± 0.3       |
| E         | .205 ± .008        | 5.2 ± 0.2       |
| F         | .197 ± .012        | 5.0 ± 0.3       |
| G         | .185 Max.          | 4.7 Max.        |
| H         | .157 Max.          | 4.0 Max.        |
| J         | .126 + .008/- .000 | 3.2 + 0.2/- 0.0 |
| K         | .110 ± .008        | 2.8 ± 0.2       |
| L         | .102 ± .008        | 2.6 ± 0.2       |
| M         | .100 ± .010        | 2.54 ± 0.25     |
| N         | .059 Max.          | 1.5 Max.        |
| P         | .047 ± .012        | 1.2 ± 0.3       |
| Q         | .031 ± .004        | 0.8 ± 0.1       |
| R         | .020 ± .004        | 0.5 ± 0.1       |

**J846  
Single EXMOS™ MOSFET  
3 Amperes/900 Volts****Description**

Powerex Single EXMOS™ MOSFET Transistors are designed for use in applications requiring hi-frequency switching and low loss control.

**Features:**

- ☐ TO-220F Isolated Package
- ☐ Vertical DMOS Construction
- ☐ Low Drive Requirement
- ☐ No Second Breakdown

**Applications:**

- ☐ AC Motor Control
- ☐ UPS Inverters
- ☐ Switch Mode Power Supply
- ☐ PWM Regulators

**Ordering Information**

Select the complete four digit module part number you desire from the table i.e. J846 is a 900 Volt, 3 Ampere Single EXMOS™ MOSFET.

| Type | V <sub>oss</sub><br>Volts (900) | Current Rating<br>Amperes (3) |
|------|---------------------------------|-------------------------------|
| J846 | —                               | —                             |



Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

### J846

Single EXMOS™ MOSFET

3 Amperes/900 Volts

### Maximum Ratings $T_c = 25^\circ\text{C}$ unless otherwise specified

| Characteristics                                                 | Symbol    | J846       | Units            |
|-----------------------------------------------------------------|-----------|------------|------------------|
| Junction Temperature                                            | $T_J$     | -55 to 150 | $^\circ\text{C}$ |
| Storage Temperature                                             | $T_{STG}$ | -55 to 150 | $^\circ\text{C}$ |
| Drain Source Voltage, $I_D = 1\text{mA}$ , $V_{GS} = 0\text{V}$ | $V_{DSS}$ | 900        | Volts            |
| Gate-Source Voltage                                             | $V_{GSS}$ | $\pm 30$   | Volts            |
| Continuous Drain Current                                        | $I_D$     | 2          | Amperes          |
| Continuous Source Current                                       | $I_S$     | 2          | Amperes          |
| Pulsed Drain Current Repetitive                                 | $I_{DM}$  | 9          | Amperes          |
| Power Dissipation                                               | $P_T$     | 40         | Watts            |
| V isolation                                                     | $V_{RMS}$ | 1500       | Volts            |
| Max. Mounting Torque, Mounting Screw (M3)                       | —         | 7          | in.-lb.          |

### Static Electrical Characteristics $T_c, T_J = 25^\circ\text{C}$ unless otherwise specified

| Characteristics                      | Symbol          | Test Conditions                                  | Min. | J846<br>Typ. | Max. | Units              |
|--------------------------------------|-----------------|--------------------------------------------------|------|--------------|------|--------------------|
| Zero Gate Voltage Drain Current      | $I_{DSS}$       | $V_{DS} = V_{DSS}$ , $V_{GS} = 0\text{V}$        | —    | —            | 1    | mA                 |
| Gate Source Leakage Current          | $\pm I_{GSS}$   | $V_{GS} = \pm 30\text{V}$ , $V_{DS} = 0\text{V}$ | —    | —            | 0.1  | $\mu\text{A}$      |
| Gate Source Threshold Voltage        | $V_{GS(th)}$    | $I_D = 1\text{mA}$ , $V_{DS} = 10\text{V}$       | 2    | 3            | 4    | Volts              |
| Drain Source On State Resistance     | $R_{DS(on)}$    | $V_{GS} = 10\text{V}$ , $I_D = 1.5\text{A}$      | —    | 3.1          | 4.0  | $\Omega$           |
| Drain Source On State Voltage        | $V_{DS(on)}$    | $V_{GS} = 10\text{V}$ , $I_D = 1.5\text{A}$      | —    | 3.0          | 3.9  | Volts              |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | —                                                | —    | —            | 3.13 | $^\circ\text{C/W}$ |

### Source Drain Diode Characteristics $T_c, T_J = 25^\circ\text{C}$ unless otherwise specified

| Characteristics       | Symbol   | Test Conditions                                                                | Min. | J846<br>Typ. | Max. | Units |
|-----------------------|----------|--------------------------------------------------------------------------------|------|--------------|------|-------|
| Source-Drain Voltage  | $V_{SD}$ | $I_S = 1.5\text{A}$ , $V_{GS} = 0\text{V}$                                     | —    | 1.1          | —    | Volts |
| Reverse Recovery Time | $t_{rr}$ | $I_S = 3\text{A}$ , $dI_S/dt = -20\text{A}/\mu\text{s}$ , $V_{GS} = 0\text{V}$ | —    | 1700         | —    | ns    |

### Dynamic Electrical Characteristics $T_c, T_J = 25^\circ\text{C}$ unless otherwise specified

| Characteristics              | Symbol    | Test Conditions                                                      | Min. | J846<br>Typ. | Max. | Units |
|------------------------------|-----------|----------------------------------------------------------------------|------|--------------|------|-------|
| Forward Transconductance     | $g_{fs}$  | $I_D = 1.5\text{A}$ , $V_{DS} = 10\text{V}$                          | 1    | 1.7          | —    | mhos  |
| Input Capacitance            | $C_{iss}$ | $V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$     | —    | 950          | —    | pF    |
| Output Capacitance           | $C_{oss}$ |                                                                      | —    | 100          | —    | pF    |
| Reverse Transfer Capacitance | $C_{rss}$ |                                                                      | —    | 55           | —    | pF    |
| Turn On Time (Note 1)        | $t_{on}$  | $V_{DD} = 200\text{V}$ , $I_D = 1.5\text{A}$ , $V_{GS} = 10\text{V}$ | —    | 70           | 150  | ns    |
| Turn Off Time (Note 1)       | $t_{off}$ | $R_{GEN} = R_{GS} = 50\Omega$                                        | —    | 140          | 280  | ns    |

Note 1: Turn on Time ( $t_{on}$ ) = Turn on Delay ( $t_{d(on)}$ ) + Rise Time ( $t_r$ )  
Turn-off Time ( $t_{off}$ ) = Turn Off Delay ( $t_{d(off)}$ ) + Fall Time ( $t_f$ )

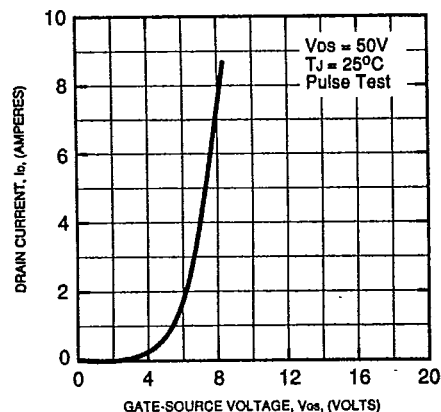
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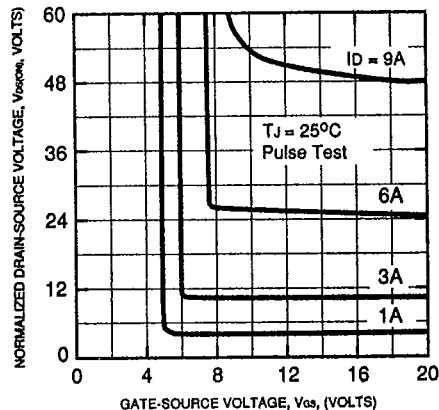
## J846

Single EXMOS™ MOSFET  
3 Amperes/900 Volts

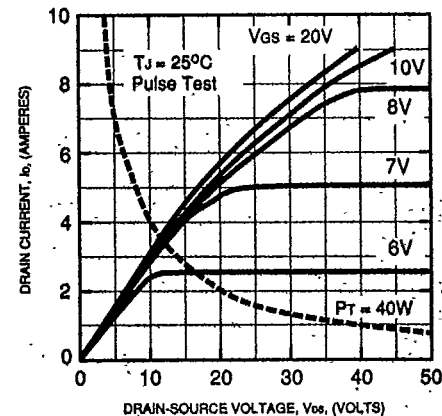
TRANSFER CHARACTERISTICS  
(TYPICAL)  
J846



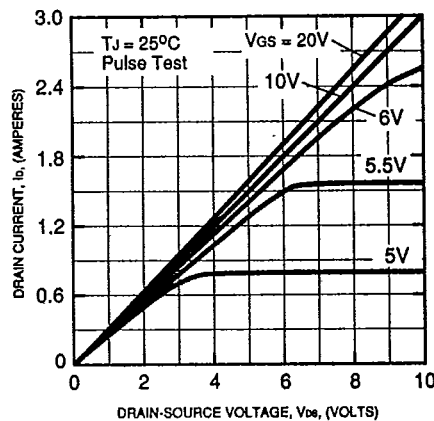
NORMALIZED DRAIN-SOURCE  
ON-STATE VOLTAGE (TYPICAL)  
J846



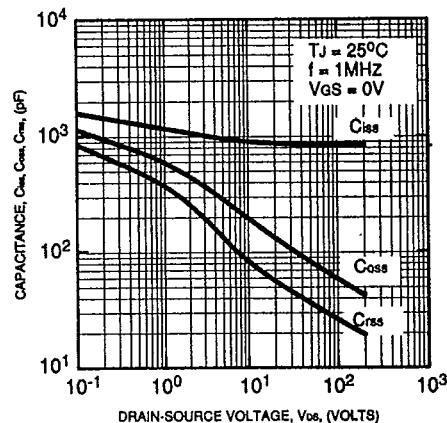
COMMON SOURCE OUTPUT  
CHARACTERISTICS (TYPICAL)  
J846



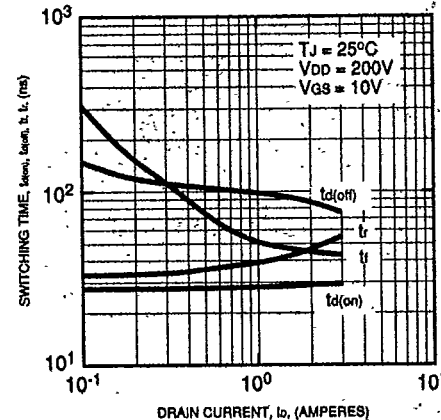
COMMON SOURCE OUTPUT  
CHARACTERISTICS (TYPICAL)  
J846



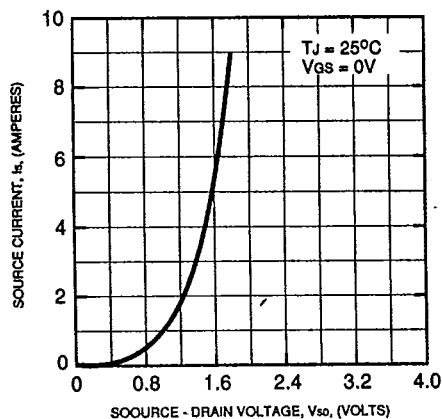
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE  
(TYPICAL)  
J846



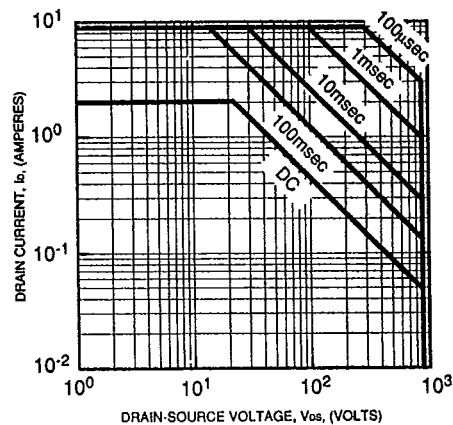
SWITCHING CHARACTERISTICS  
(TYPICAL)  
J846



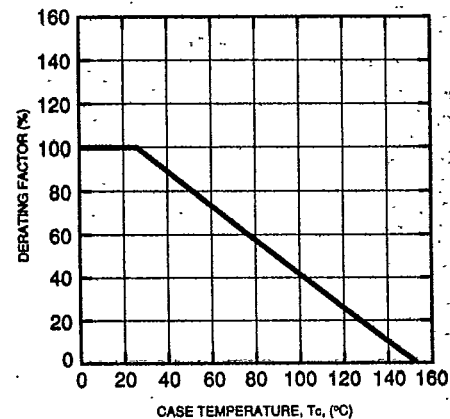
SOURCE-DRAIN DIODE  
FORWARD CHARACTERISTICS (TYPICAL)  
J846



FORWARD BIAS SAFE OPERATING AREA  
(S.O.A.)  
J846



TEMPERATURE DERATING FACTOR  
OF SAFE OPERATING AREA (S.O.A.)  
J846

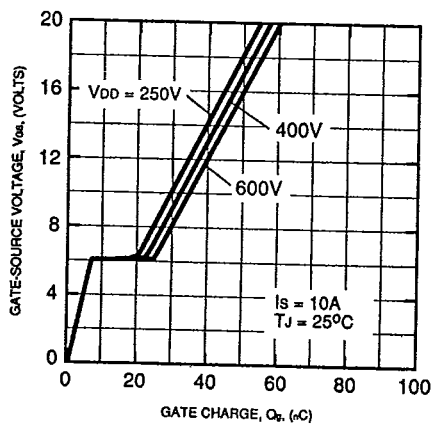
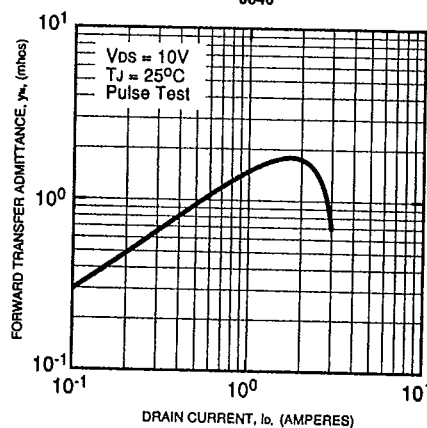
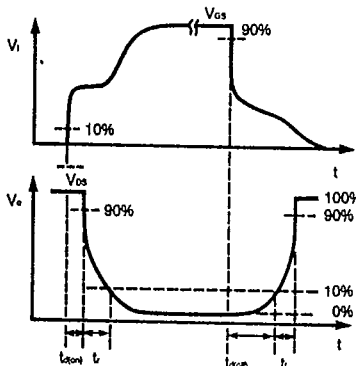
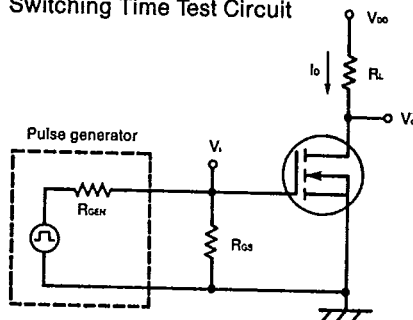


**POWEREX**

T-39-11

**Tentative**

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

**J846****Single EXMOS™ MOSFET****3 Amperes/900 Volts****GATE CHARGE VS.  $V_{GS}$**   
(TYPICAL)  
J846**FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)**  
J846**Switching Time Test Circuit**

Notice: MOS devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling should be observed.