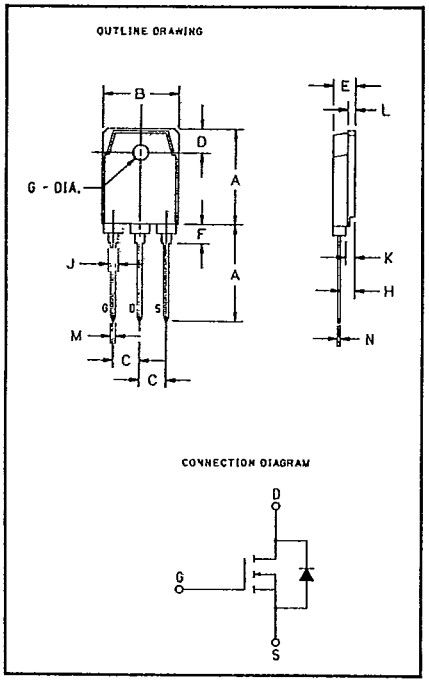
# JS010504 Tentative

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

## Single EXMOS™ MOSFET

### 40 Amperes/50 Volts




**50 Volts JS010504**
**Outline Drawing**

| Dimension | Inches | Millimeters |
|---|---|---|
| A | .787 | 20 |
| B | .614 | 15.6 |
| C | .214 ± .008 | 5.45 ± 0.2 |
| D | .197 | 5 |
| E | .177 | 4.5 |
| F | .157 | 4 |
| G | .126 ± .008 Dia. | 3.2 ± 0.2 Dia. |
| H | .110 | 2.8 |
| J | .079 | 2 |
| K | .071 | 1.8 |
| L | .059 | 1.5 |
| M | .039 | 1 |
| N | .024 | 0.6 |

**Description**
Powerex Single EXMOS™ MOSFET Transistors are designed for use in applications requiring Hi-Frequency switching and low loss control.

**Features:**
- ☐ TO-3P Package
- ☐ Vertical DMOS Construction
- ☐ Low Drive Requirement
- ☐ No Second Breakdown

**Applications:**
- ☐ AC Motor Control
- ☐ UPS Inverters
- ☐ Switch Mode Power Supply
- ☐ PWM Regulator

**Ordering Information**
Select the complete eight digit module part number you desire from the table- i.e. JS010504 is a 50 Volt, 40 Ampere Single EXMOS™ MOSFET.

| Type | $V_{DSS}$ Volts (×10) | Current Rating Amperes (×10) |
|---|---|---|
| JS01 | 05 | 04 |

POWEREX

**Tentative**

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

***JS010504***
***Single EXMOS™ MOSFET***
*40 Amperes/50 Volts*

## Maximum Ratings $T_C$ =25°C unless otherwise specified

| Characteristics | Symbol | JS010504 | Units |
|---|---|---|---|
| Junction Temperature | $T_J$ | −55 to 150 | °C |
| Storage Temperature | $T_{STG}$ | −55 to 150 | °C |
| Drain Source Voltage, $I_D$ =1mA, $V_{GS}$ =0V | $V_{DSS}$ | 50 | Volts |
| Gate-Source Voltage | $V_{GSS}$ | ±30 | Volts |
| Continuous Drain Current | $I_D$ | 36 | Amperes |
| Continuous Source Current | $I_S$ | 36 | Amperes |
| Pulsed Drain Current Repetitive | $I_{DM}$ | 120 | Amperes |
| Power Dissipation | $P_T$ | 120 | Watts |
| Max Mounting Torque, Mounting Screw (M3) | — | 7 | in.-lb. |

## Static Electrical Characteristics $T_C$, $T_J$ =25°C unless otherwise specified

| Characteristics | Symbol | Test Conditions | JS010504 Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}=V_{DSS}$, $V_{GS}=0V$ | — | — | 1 | mA |
| Gate Source Leakage Current | $\pm I_{GSS}$ | $V_{GS}=\pm 30V$, $V_{DS}=0V$ | — | — | 0.1 | μA |
| Gate Source Threshold Voltage | $V_{GS(th)}$ | $I_D$ = 1 mA, $V_{DS}$ = 10V | 2 | 3 | 4 | Volts |
| Drain Source On State Resistance | $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 20A | — | .03 | 0.045 | Ω |
| Drain Source On State Voltage | $V_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 20A | — | 0.6 | 0.9 | Volts |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | — | — | — | 1.0 | °C/W |

## Source Drain Diode Characteristics $T_C$, $T_J$ =25°C unless otherwise specified

| Characteristics | Symbol | Test Conditions | JS010504 Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Source-Drain Voltage | $V_{SD}$ | $I_S$ =20A, $V_{GS}$ =0V | — | 1.3 | — | Volts |
| Reverse Recovery Time | $t_{rr}$ | $I_S$ =40A, $dI_S/dt=-20A/\mu s$, $V_{GS}$ =0V | — | 160 | — | ns |

## Dynamic Electrical Characteristics $T_C$, $T_J$ =25°C unless otherwise specified

| Characteristics | Symbol | Test Conditions | JS010504 Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Forward Transconductance | $g_{fs}$ | $I_D$ =20A, $V_{DS}$ =10V | 9 | 12 | — | mhos |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ =0V, $V_{DS}$ =10V, f=1MHz | — | 2500 | — | pF |
| Output Capacitance | $C_{oss}$ | | — | 150 | — | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | — | 450 | — | pF |
| Turn On Time (Note 1) | $t_{on}$ | $V_{DD}$ =25V, $I_D$ =20A, $V_{GS}$ =10V | — | 160 | 320 | ns |
| Turn Off Time (Note 1) | $t_{off}$ | $R_{GEN}=R_{GS}=50\Omega$ | — | 215 | 430 | 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 ($t_f$)

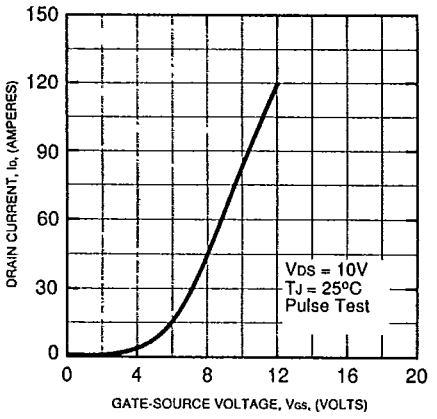
**POWEREX**

**Tentative**

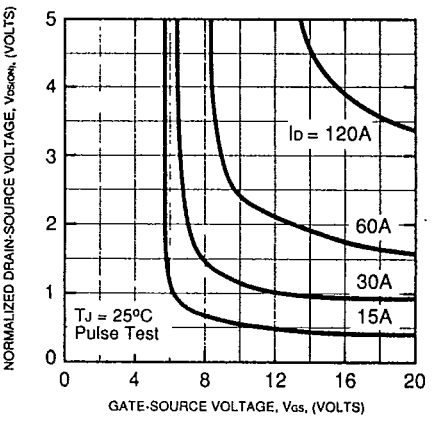
*Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272*

***JS010504***
***Single EXMOS™ MOSFET***
*40 Amperes/50 Volts*

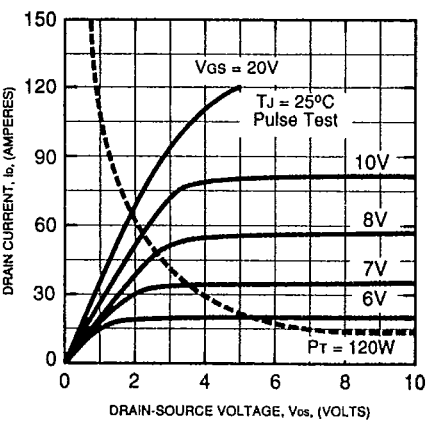
**TRANSFER CHARACTERISTICS (TYPICAL) JS010504**



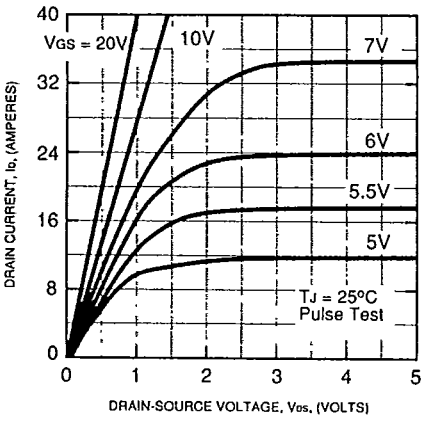

**NORMALIZED DRAIN-SOURCE ON-STATE VOLTAGE (TYPICAL) JS010504**



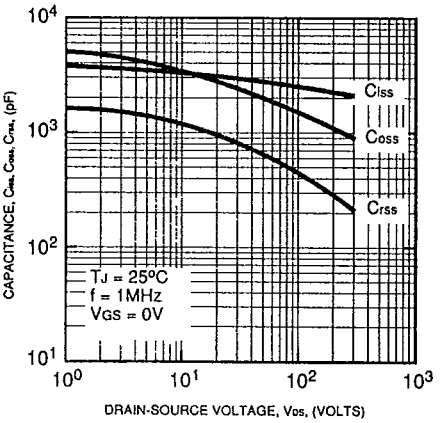

**COMMON SOURCE OUTPUT CHARACTERISTICS (TYPICAL) JS010504**



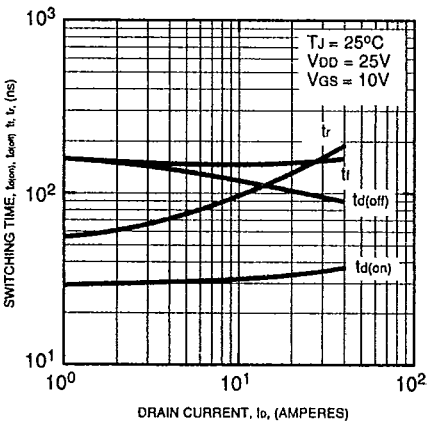

**COMMON SOURCE OUTPUT CHARACTERISTICS (TYPICAL) JS010504**



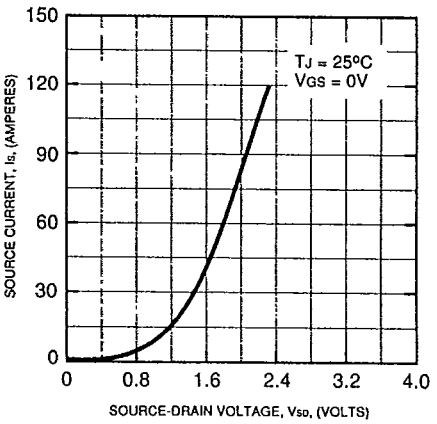

**CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL) JS010504**



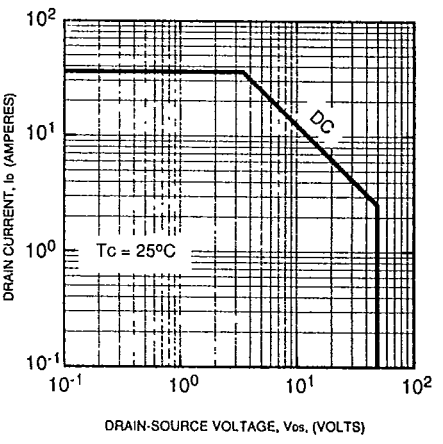

**SWITCHING CHARACTERISTICS (TYPICAL) JS010504**



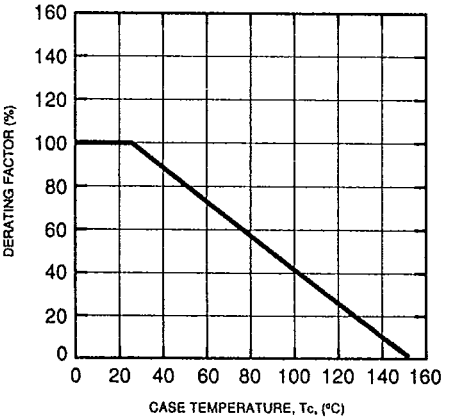

**SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL) JS010504**




**FORWARD BIAS SAFE OPERATING AREA (S.O.A.) JS010504**




**TEMPERATURE DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.) JS010504**

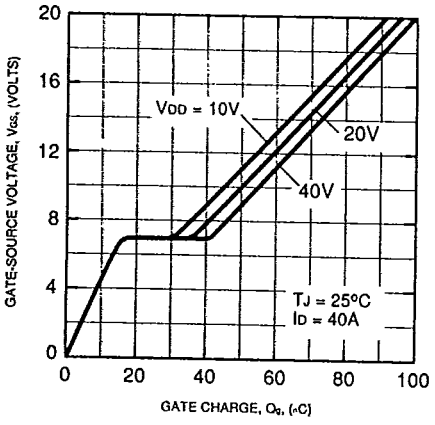


**Tentative**

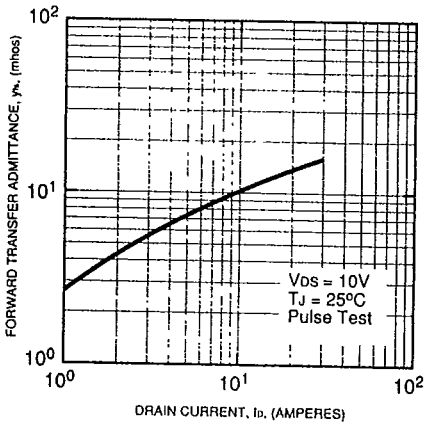
*Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272*

***JS010504***
***Single EXMOS™ MOSFET***
*40 Amperes/50 Volts*

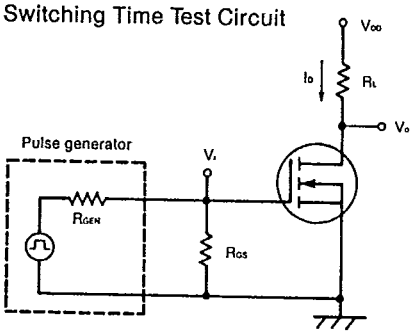
GATE CHARGE VS. $V_{GS}$
(TYPICAL)
JS010504

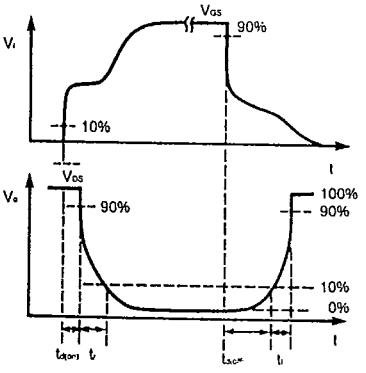



FORWARD TRANSFER ADMITTANCE VS.
DRAIN CURRENT (TYPICAL)
JS010504




Switching Time Test Circuit




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