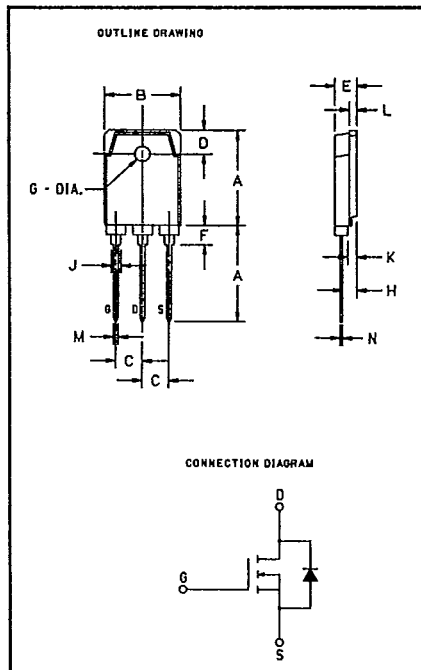


POWEREX

JS012502 T-39-13
 JS013002 Tentative

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

**Single EXMOS™
 MOSFET**
20 Amperes/250-300 Volts



250-300 Volts JS012502, JS013002
 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. JS013002 is a 300 Volt, 20 Ampere Single EXMOS™ MOSFET.

Type	V _{DS} Volts (×10)	Current Rating Amperes (×10)
JS01	25	02
	30	



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JS012502
JS013002
Single EXMOS™ MOSFET
20 Amperes/250-300 Volts

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

Characteristics	Symbol	JS012502/JS013002	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_{DS}	250/300	Volts
Gate-Source Voltage	V_{GS}	± 30	Volts
Continuous Drain Current	I_D	17/16	Amperes
Continuous Source Current	I_S	17/16	Amperes
Pulsed Drain Current Repetitive	I_{DM}	60	Amperes
Power Dissipation	P_T	150	Watts
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	JS012502			JS013002			Units
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = V_{DSS}, V_{GS} = 0\text{V}$	—	—	1	—	—	1	mA
Gate Source Leakage Current	$\pm I_{GSS}$	$V_{GS} = \pm 30\text{V}, V_{DS} = 0\text{V}$	—	—	0.1	—	—	0.1	μA
Gate Source Threshold Voltage	$V_{GS(th)}$	$I_D = 1\text{mA}, V_{DS} = 10\text{V}$	2	3	4	2	3	4	Volts
Drain Source On State Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 10\text{A}$	—	0.2	0.26	—	0.22	0.29	Ω
Drain Source On State Voltage	$V_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 10\text{A}$	—	2.0	2.6	—	2.2	2.9	Volts
Thermal Resistance, Junction to Case	$R_{\theta JC}$	—	—	—	0.83	—	—	0.83	$^\circ\text{C/W}$

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

Characteristics	Symbol	Test Conditions	JS012502/JS013002			Units
			Min.	Typ.	Max.	
Source-Drain Voltage	V_{SD}	$I_S = 10\text{A}, V_{GS} = 0\text{V}$	—	1.3	—	Volts
Reverse Recovery Time	t_{rr}	$I_S = 20\text{A}, di_S/dt = -20\text{A}/\mu\text{s}, V_{GS} = 0\text{V}$	—	500	—	ns

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

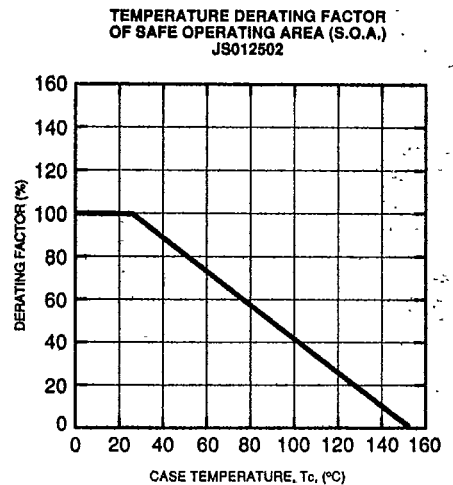
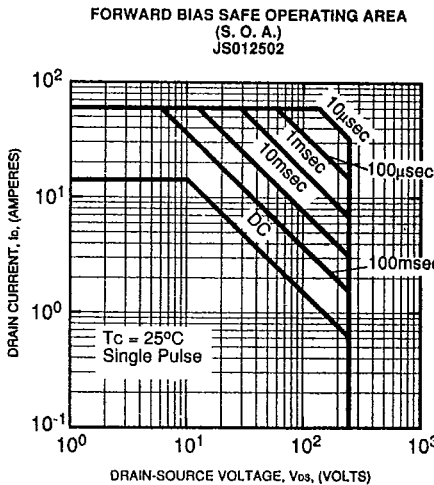
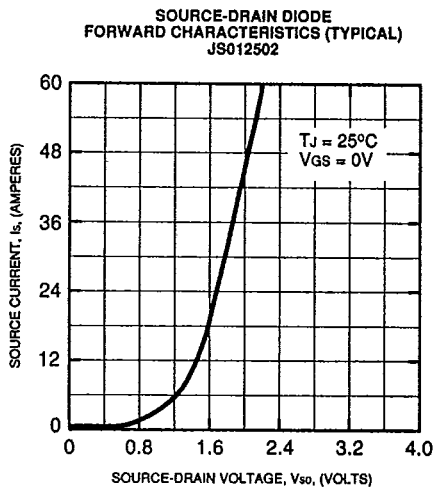
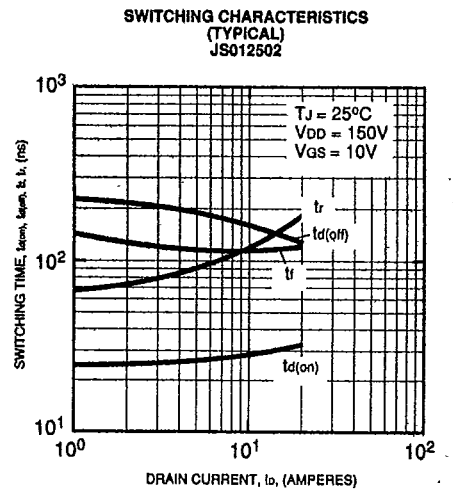
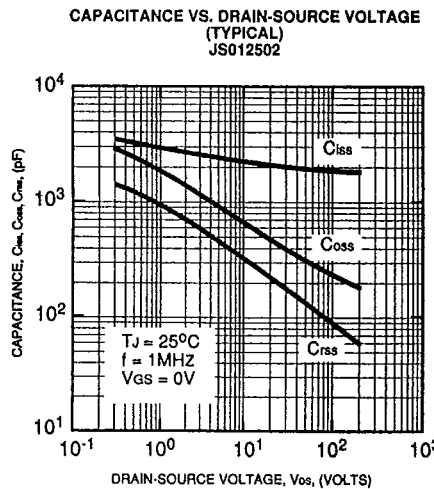
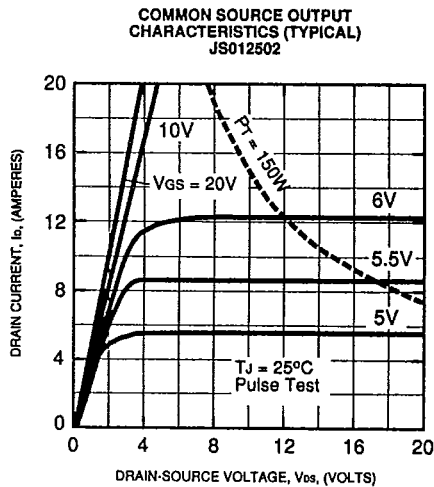
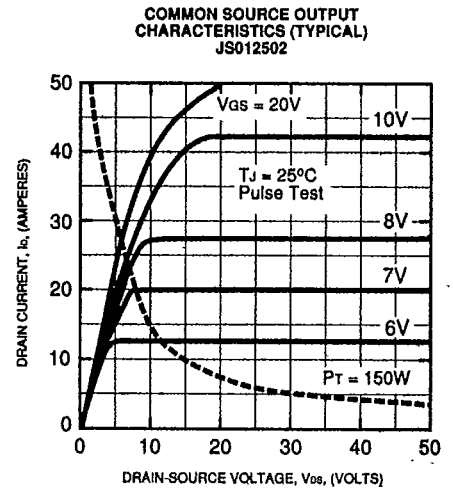
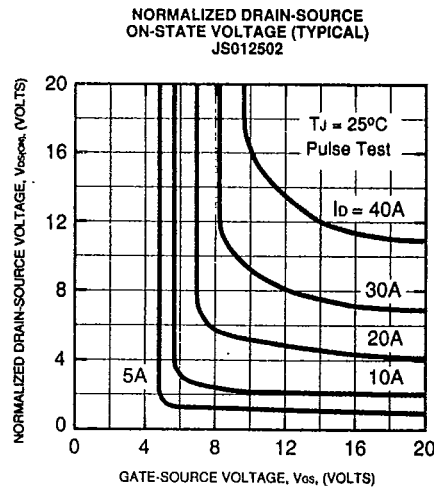
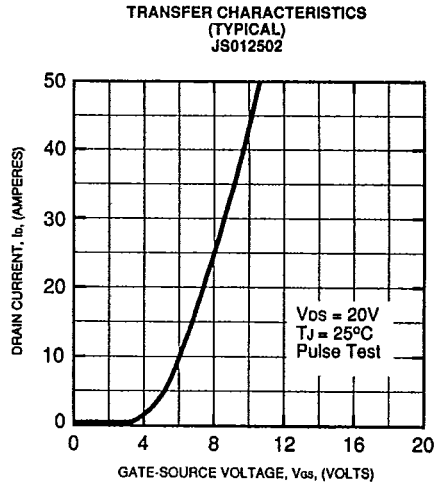
Characteristics	Symbol	Test Conditions	JS012502/JS013002			Units
			Min.	Typ.	Max.	
Forward Transconductance	g_{fs}	$I_D = 10\text{A}, V_{DS} = 10\text{V}$	4	7	—	mhos
Input Capacitance	C_{iss}	—	—	2200	—	pF
Output Capacitance	C_{oss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$	—	450	—	pF
Reverse Transfer Capacitance	C_{rss}	—	—	150	—	pF
Turn On Time (Note 1)	t_{on}	$V_{DD} = 150\text{V}, I_D = 10\text{A}, V_{GS} = 10\text{V}$	—	160	320	ns
Turn Off Time (Note 1)	t_{off}	$R_{GEN} = R_{GS} = 50\Omega$	—	280	560	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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JS012502
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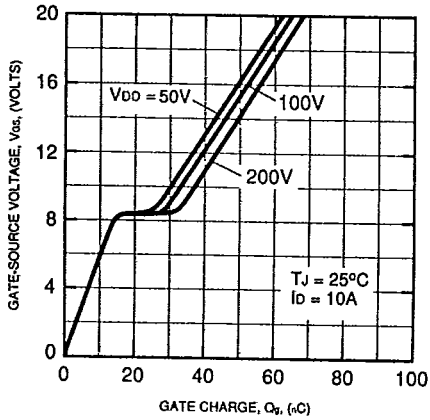




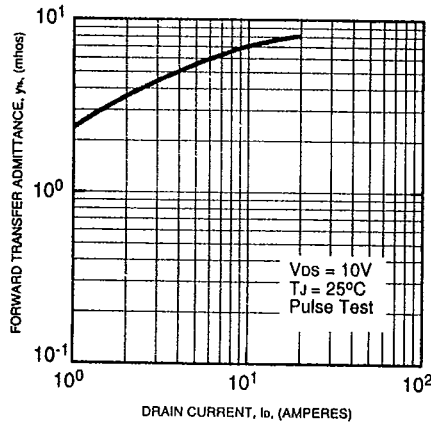
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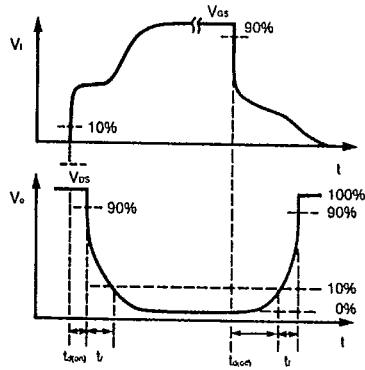
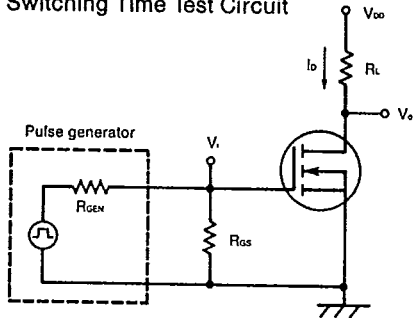
GATE CHARGE VS. V_{GS}
 (TYPICAL)
 JS012502



FORWARD TRANSFER ADMITTANCE VS.
 DRAIN CURRENT (TYPICAL)
 JS012502



Switching Time Test Circuit



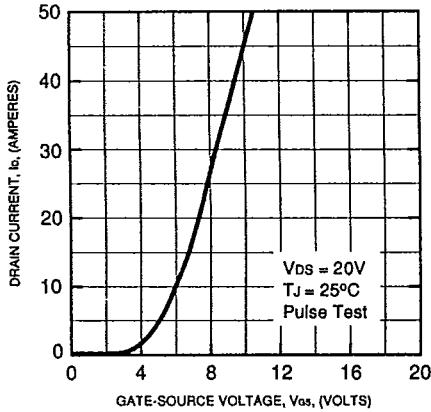
Notice: MOS devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling should be observed.



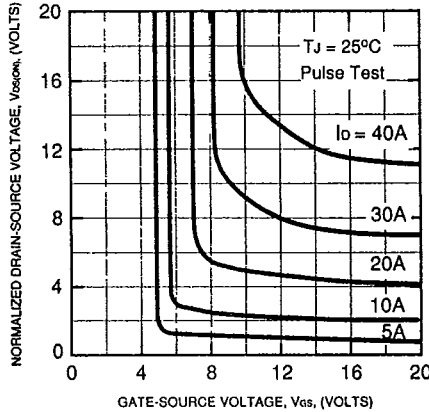
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JS012502
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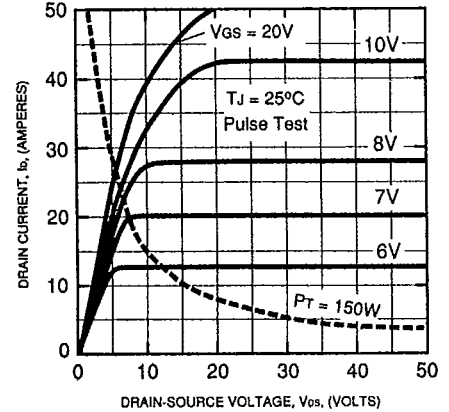
TRANSFER CHARACTERISTICS
(TYPICAL)
JS013002



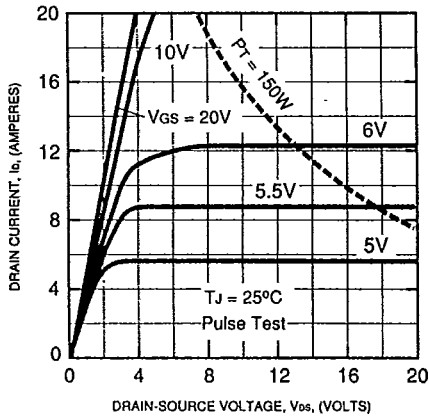
NORMALIZED DRAIN-SOURCE
ON-STATE VOLTAGE (TYPICAL)
JS013002



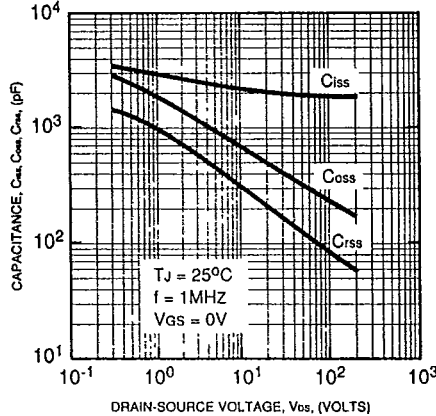
COMMON SOURCE OUTPUT
CHARACTERISTICS (TYPICAL)
JS013002



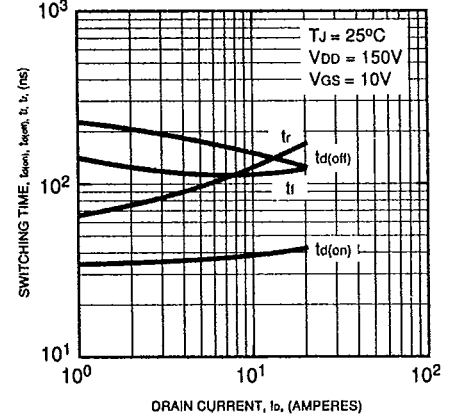
COMMON SOURCE OUTPUT
CHARACTERISTICS (TYPICAL)
JS013002



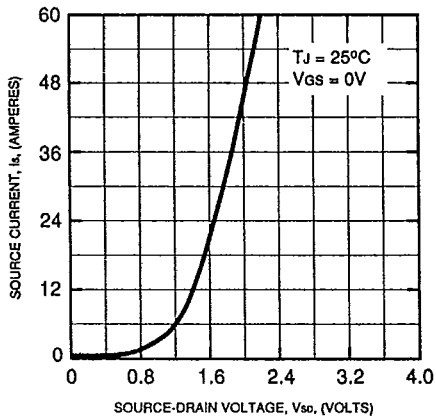
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE
(TYPICAL)
JS013002



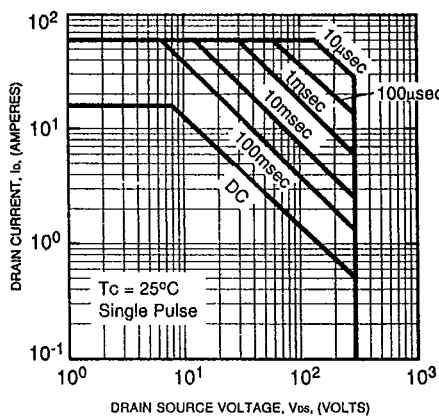
SWITCHING CHARACTERISTICS
(TYPICAL)
JS013002



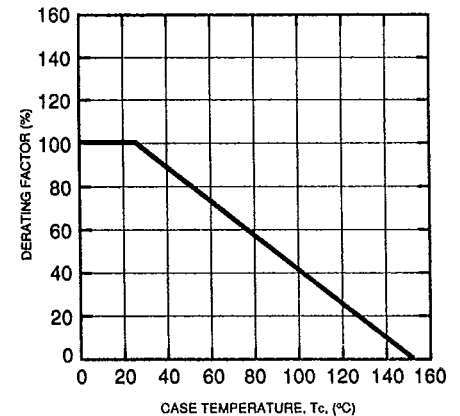
SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS (TYPICAL)
JS013002



FORWARD BIAS SAFE OPERATING AREA
(S.O.A.)
JS013002



TEMPERATURE DERATING FACTOR
OF SAFE OPERATING AREA (S.O.A.)
JS013002

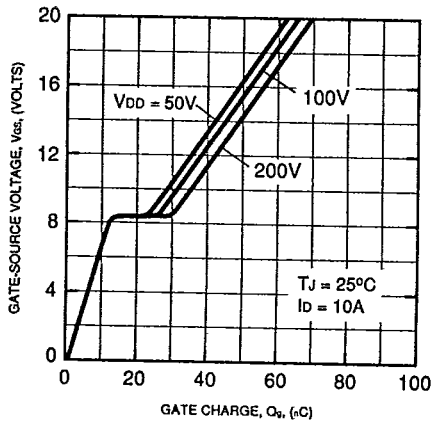




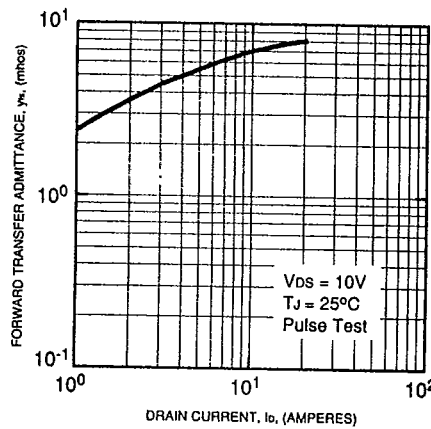
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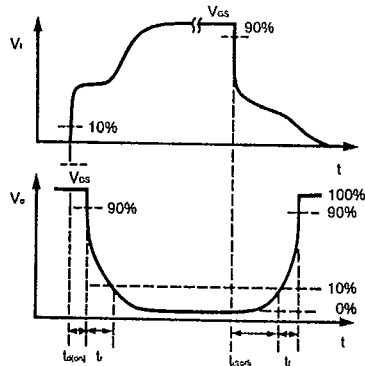
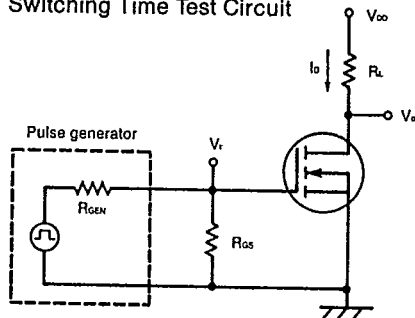
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