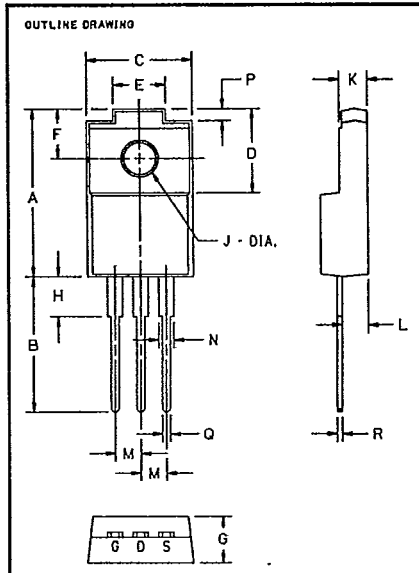
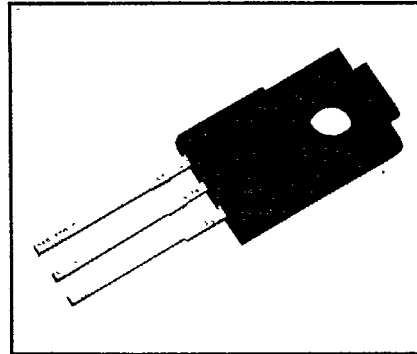


POWEREX

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**J845
J987****Tentative**

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

**Single EXMOS™
MOSFET****5 Amperes/450-500 Volts****450-500 Volts J845, J987
Outline Drawing****J845, J987
Single EXMOS™ MOSFET
5 Amperes/450-500 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. J987 is a 500 Volt, 5 Ampere Single EXMOS™ MOSFET, and J845 is a 450 Volt, 5 Ampere Single EXMOS™ MOSFET.

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

Type	V _{oss} Volts (450-500)	Current Rating Amperes (5)
J845	—	—
J987	—	—



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J845

J987

Single EXMOS™ MOSFET

5 Amperes/450-500 Volts

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

Characteristics	Symbol	J845/J987	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}	450/500	Volts
Gate-Source Voltage	V_{GS}	± 30	Volts
Continuous Drain Current	I_D	4/3	Amperes
Continuous Source Current	I_S	4/3	Amperes
Pulsed Drain Current Repetitive	I_{DM}	15	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.	J845 Typ.	Max.	Min.	J987 Typ.	Max.	Units
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	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 3\text{A}$	—	1	1.3	—	1.2	1.6	Ω
Drain Source On State Voltage	$V_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 3\text{A}$	—	3.0	3.9	—	3.6	4.8	Volts
Thermal Resistance, Junction to Case	$R_{\theta JC}$	—	—	—	3.13	—	—	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.	J845/J987 Typ.	Max.	Units
Source-Drain Voltage	V_{SD}	$I_S = 3\text{A}, V_{GS} = 0\text{V}$	—	1.2	—	Volts
Reverse Recovery Time	t_{rr}	$I_S = 5\text{A}, di/dt = -20\text{A}/\mu\text{s}, V_{GS} = 0\text{V}$	—	520	—	ns

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

Characteristics	Symbol	Test Conditions	Min.	J845/J987 Typ.	Max.	Units
Forward Transconductance	g_{fs}	$I_D = 3\text{A}, V_{DS} = 10\text{V}$	1.5	2.5	—	mhos
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$	—	750	—	pF
Output Capacitance	C_{oss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$	—	130	—	pF
Reverse Transfer Capacitance	C_{rss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$	—	50	—	pF
Turn On Time (Note 1)	t_{on}	$V_{DD} = 200\text{V}, I_D = 3\text{A}, V_{GS} = 10\text{V}$	—	70	140	ns
Turn Off Time (Note 1)	t_{off}	$R_{GEN} = R_{GS} = 50\Omega$	—	100	200	ns

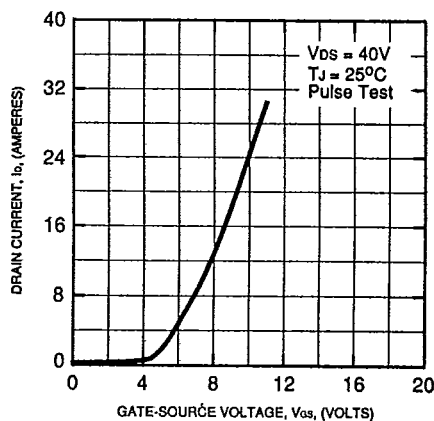
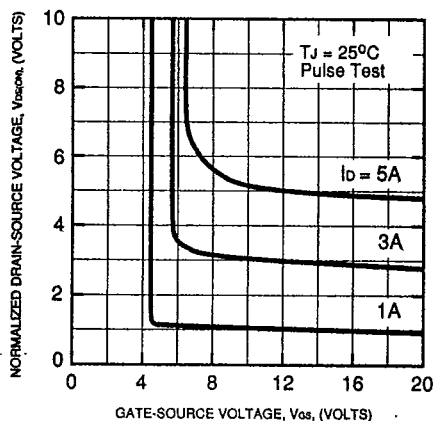
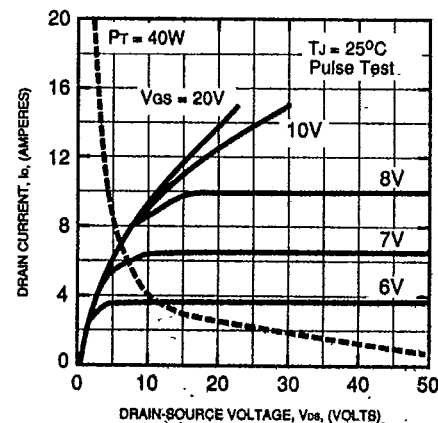
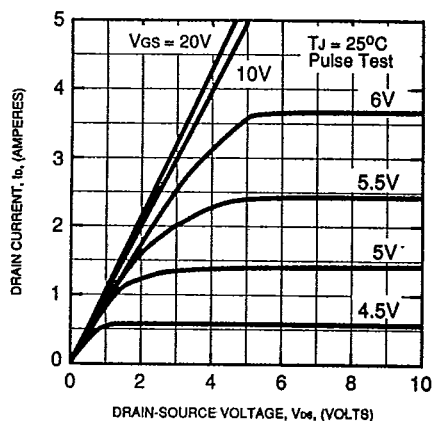
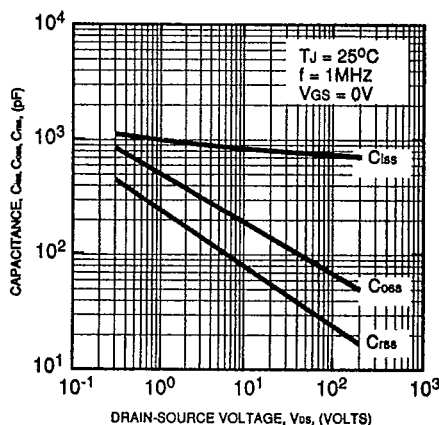
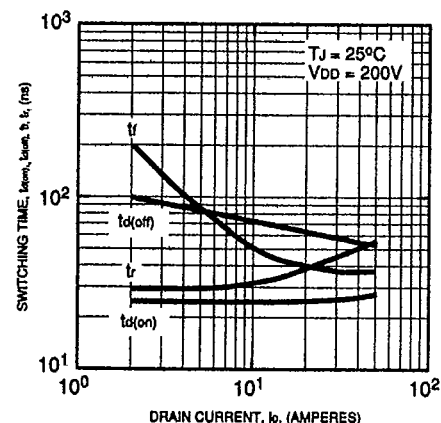
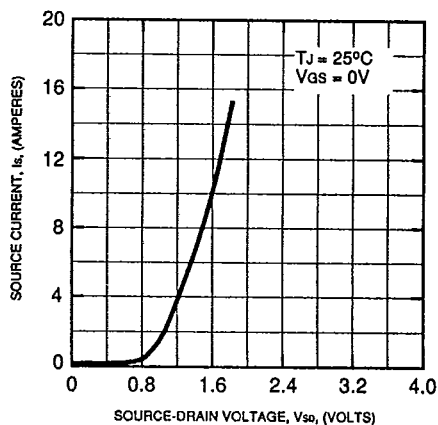
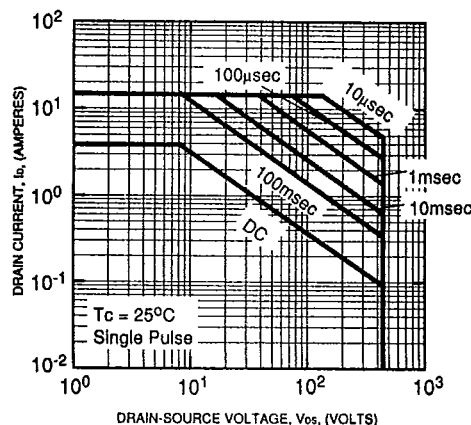
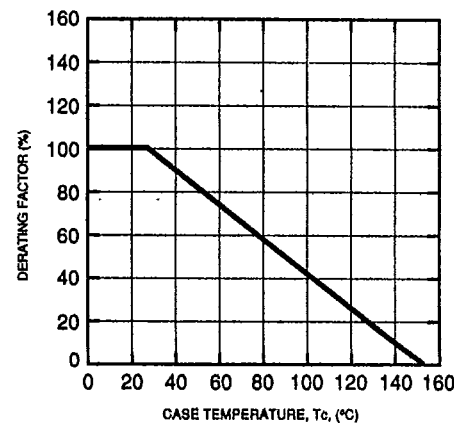
Note 1: Turn on Time (t_{on}) = Turn on Delay ($t_{d(on)}$) + Rise Time (t_r)
 Turn-off Time (t_{off}) = Turn off Delay ($t_{d(off)}$) + Fall Time (t_f)

POWEREX

T-39-11

Tentative

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J845**J987****Single EXMOS™ MOSFET****5 Amperes/450-500 Volts****TRANSFER CHARACTERISTICS
(TYPICAL)
J845****NORMALIZED DRAIN-SOURCE
ON-STATE VOLTAGE (TYPICAL)
J845****COMMON SOURCE OUTPUT
CHARACTERISTICS (TYPICAL)
J845****COMMON SOURCE OUTPUT
CHARACTERISTICS (TYPICAL)
J845****CAPACITANCE VS. DRAIN-SOURCE VOLTAGE
(TYPICAL)
J845****SWITCHING CHARACTERISTICS
(TYPICAL)
J845****SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS (TYPICAL)
J845****FORWARD BIAS SAFE OPERATING AREA
(S.O.A.)
J845****TEMPERATURE DERATING FACTOR
OF SAFE OPERATING AREA (S.O.A.)
J845**

POWEREX

T-39-11

Tentative

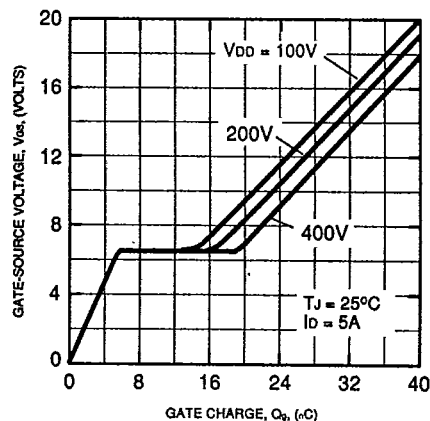
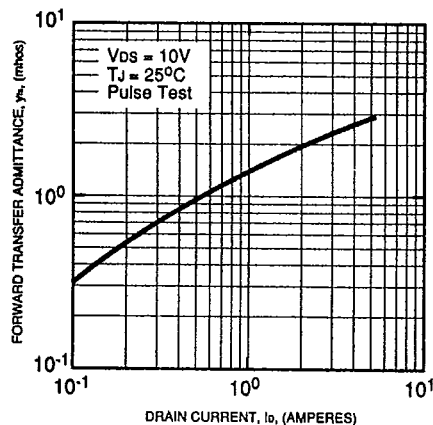
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J845

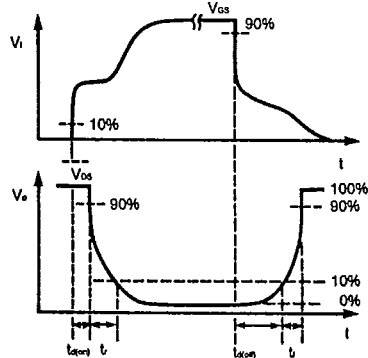
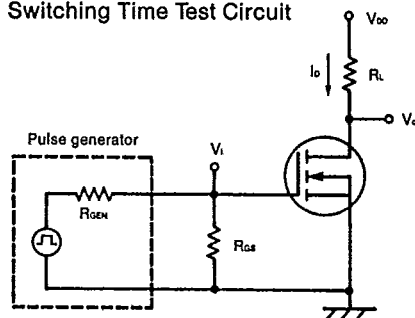
J987

Single EXMOS™ MOSFET

5 Amperes/450-500 Volts

GATE CHARGE VS. V_{GS}
(TYPICAL)
J845FORWARD TRANSFER ADMITTANCE VS.
DRAIN CURRENT (TYPICAL)
J845

Switching Time Test Circuit



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

POWEREX

T-39-11

Tentative

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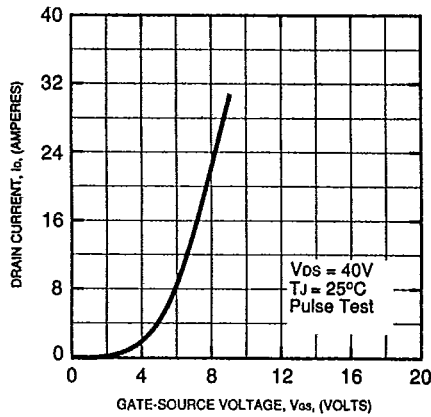
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J987

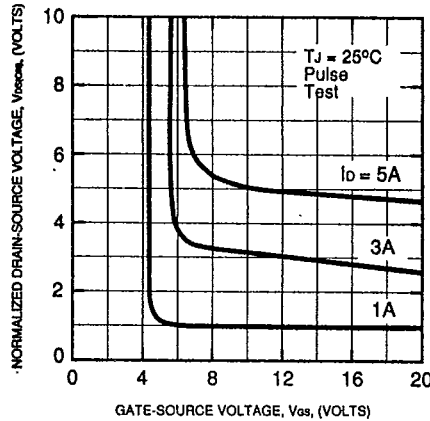
Single EXMOS™ MOSFET

5 Amperes/450-500 Volts

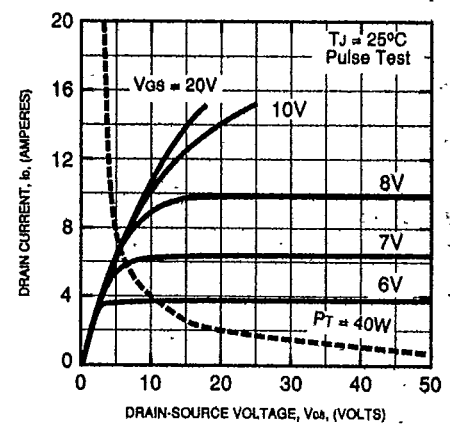
TRANSFER CHARACTERISTICS
(TYPICAL)
J987



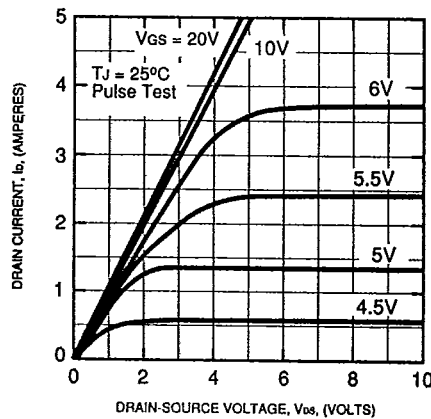
NORMALIZED DRAIN-SOURCE
ON-STATE VOLTAGE (TYPICAL)
J987



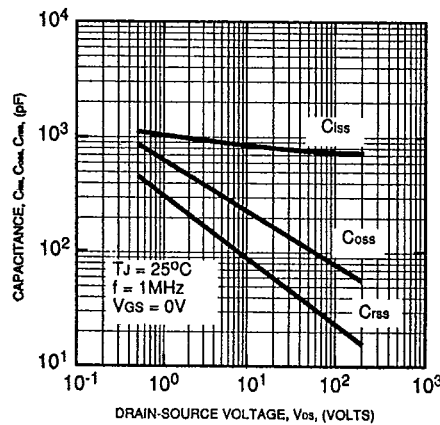
COMMON SOURCE OUTPUT
CHARACTERISTICS (TYPICAL)
J987



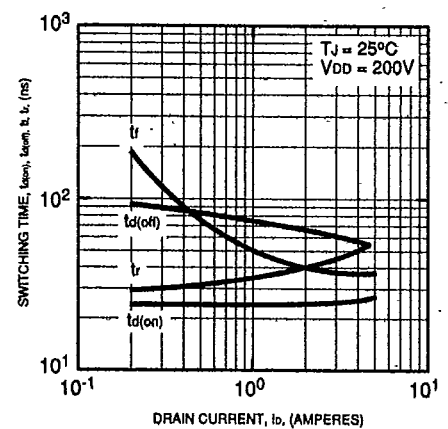
COMMON SOURCE OUTPUT
CHARACTERISTICS (TYPICAL)
J987



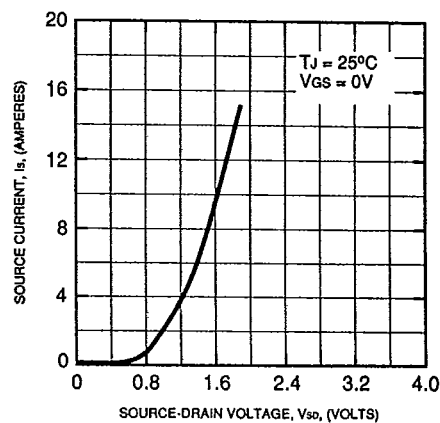
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE
(TYPICAL)
J987



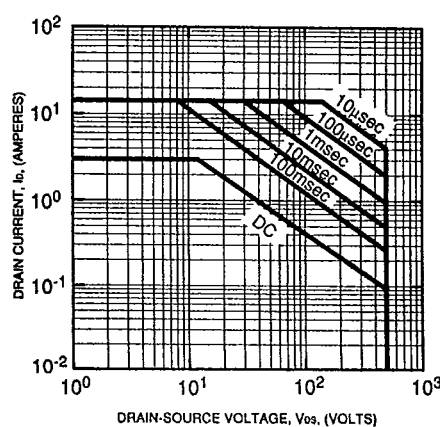
SWITCHING CHARACTERISTICS
(TYPICAL)
J987



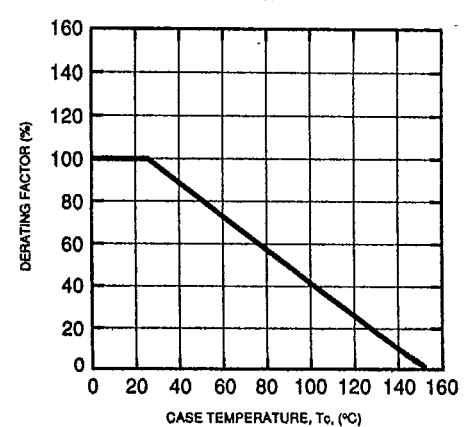
SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS (TYPICAL)
J987



FORWARD BIAS SAFE OPERATING AREA
(S.O.A.)
J987



TEMPERATURE DERATING FACTOR
OF SAFE OPERATING AREA (S.O.A.)
J987



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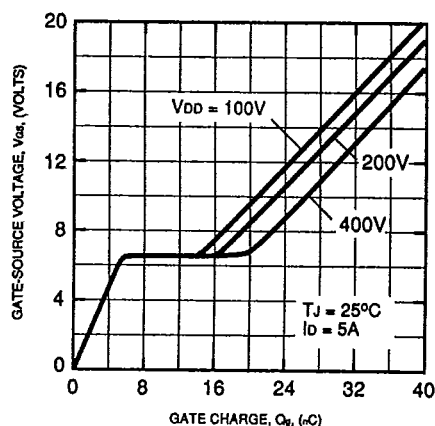
J845

J987

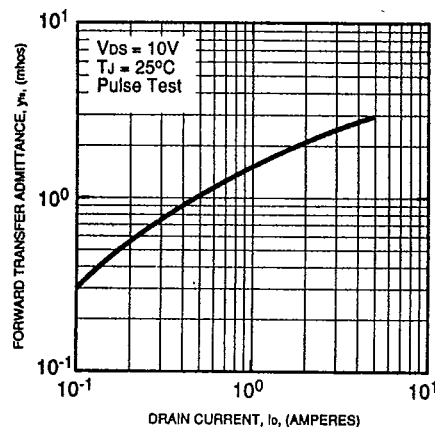
Single EXMOS™ MOSFET

5 Amperes/450-500 Volts

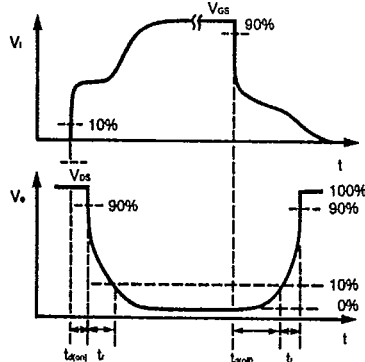
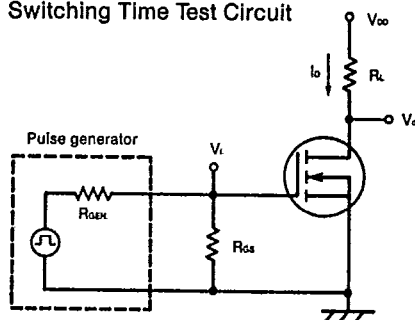
GATE CHARGE VS. V_{DS} AND V_{GS}
(TYPICAL)
J987



FORWARD TRANSFER ADMITTANCE VS.
DRAIN CURRENT (TYPICAL)
J987



Switching Time Test Circuit



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