TOPAZ
SEMICONDUCTOR

TZ400, TZ402

N-CHANNEL ENHANCEMENT-MODE
D-MOS FETs

ORDERING INFORMATION

TO-92 Plastic Package	TZ400BD	TZ402BD
Description	30V, 80 ohm	15V, 80 ohm

FEATURES

■ Reliable, low cost, plastic package
■ High Speed Switching, tr <1nSec
■ Low Capacitance, c_{rss} 0.3 pF typ
■ CMOS and TTL Compatible Input

APPLICATIONS

■ Switch Drivers
■ Video Switches
■ Active Pullups
■ VHF/UHF Amplifiers

ABSOLUTE MAXIMUM RATINGS (T_c = +25°C unless otherwise noted)

Drain-Source Voltage
  TZ400 . . . . +30V
  TZ402 . . . . +15V
Gate-Source Voltage . . . . -0.3V
                                                              +20V
Gate-Drain Voltage . . . . -0.3V
                                                              +20V

Source-Drain Voltage . . . . -0.3V
Continuous Drain Current 50mA
Power Dissipation (at or below
  T_c = +25°C). 300mW
Linear Derating Factor . . . . 3.0mW/°C
Operating Storage and
  Junction Temperature Range . . . -40°C to +125°C

PIN CONFIGURATION/SCHEMATIC DIAGRAM

TO-92

S G D

Gate

Drain

Source
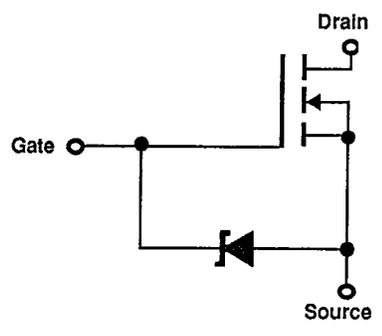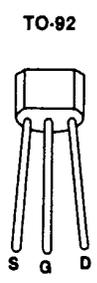
PACKAGE DIMENSIONS
(TO-92) TO-226AA

See Package 5

0-88-6

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ELECTRICAL CHARACTERISTICS (T_C = +25°C)

#		CHARACTERISTIC	TZ400			TZ402			UNIT	TEST CONDITIONS
			MIN	TYP	MAX	MIN	TYP	MAX		
1	STATIC	BV_{DS} Drain-Source Breakdown Voltage	30	35		15	25		V	I_D = 1.0µA, V_{GS} = 0
2		$I_{D(off)}$ Drain-Source OFF Leakage Current			1.0			1.0	µA	V_{DS} = 15V, V_{GS} = 0
3		I_{GSS} Gate-Source Leakage Current			1.0			1.0	µA	V_{GS} = 20V, V_{DS} = 0
4		$I_{D(on)}$ Drain-Source ON Current	50	100		50	100		mA	V_{DS} = 10V, V_{GS} = 10V Pulse Test
5		$V_{GS(th)}$ Gate-Source Threshold Voltage	0.7		1.5	0.7		1.5	V	I_D = 1.0µA, V_{DS} = V_{GS}
6		$V_{DS(on)}$ Drain-Source ON Voltage		150	250		150	250	mV	I_D = 1mA, V_{GS} = 2.4V
7		$r_{DS(on)}$ Drain-Source ON Resistance		150	250		150	250	ohms	
8		$V_{DS(on)}$ Drain-Source ON Voltage		60	80		60	80	mV	I_D = 1mA, V_{GS} = 4.5V
9		$r_{DS(on)}$ Drain-Source ON Resistance		60	80		60	80	ohms	
10	DYNAMIC	g_{fs} Common-Source Forward Transcond.	8.0	12		8.0	12		mmhos	I_D = 20mA, V_{DS} = 10V f = 1KHz Pulse Test
11		C_{iss} Common-Source Input Capacitance		4.0	5.0		4.0	5.0	pf	V_{DS} = 10V, V_{GS} = 0 f = 1MHz
12		C_{oss} Common-Source Output Capacitance		1.8	2.5		1.8	2.5		
13		C_{rss} Common-Source Reverse Transfer Capacitance		0.3	0.5		0.3	0.5		
14		$t_{d(on)}$ Turn ON Delay Time		0.7	1.0		0.7	1.0	nS	V_{DD} = 10V, R_L = 680Ω $V_{G(on)}$ = 10V, R_G = 51Ω C_L = 1.5pF
15		t_r Rise Time		0.8	1.0		0.8	1.0		
16		$t_{(off)}$ Turn OFF Time		12			12			

T-35-25

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SWITCHING TIMES TEST CIRCUIT

Input Pulse
$t \leq 0.5$nSEC
Pulse Width - 100nSEC
Sampling Oscilloscope
$t_r < 0.36$nSEC
$R_{in} > 1$MΩ
$C_{in} < 2.0$pF

OSCILLOSCOPE
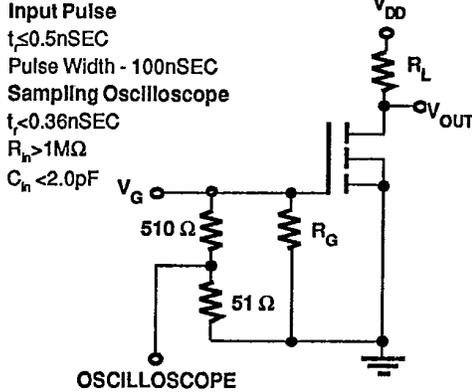
TEST WAVEFORMS
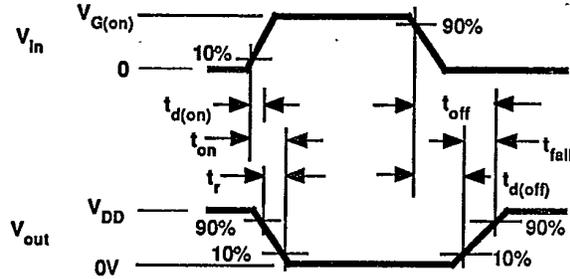
TYPICAL PERFORMANCE CHARACTERISTICS (T_C = +25°C unless otherwise noted)

DRAIN-SOURCE ON RESISTANCE
-VS-
GATE-SOURCE VOLTAGE

I_D = 1mA, VBS = 0
PULSE TEST
80μSEC
1% DUTY CYCLE

T_C = +125°C
T_C = +25°C
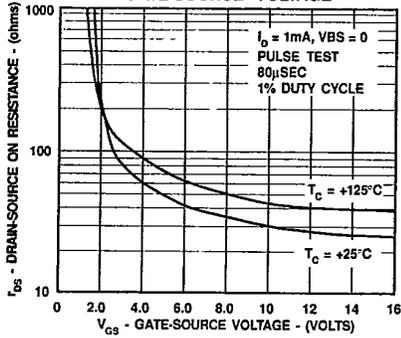
DRAIN-SOURCE ON VOLTAGE
-VS-
GATE-SOURCE VOLTAGE

I_D = 1.0mA
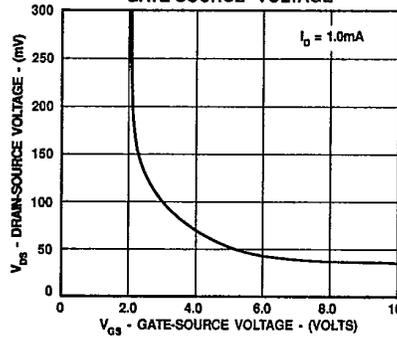
ON DRAIN CURRENT
-VS-
GATE-SOURCE VOLTAGE

VDS = 10V, VBS = 0
PULSE TEST
80μSEC
1% DUTY CYCLE

T_C = +25°C
T_C = +125°C
I_{DZ} ~ 6mA
T_C = +25°C
T_C = +125°C
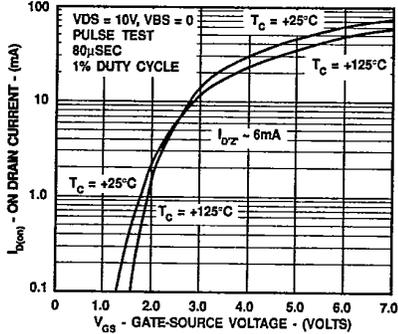
FORWARD TRANSCONDUCTANCE
-VS-
ON DRAIN CURRENT

V_{DS} = 10V
V_{SB} = 0
f = 1KHz
PULSE TEST
80μSEC
1% DUTY CYCLE

3-127