

TOPAZ
SEMICONDUCTOR

T-35-25-
TZ404

**N-CHANNEL ENHANCEMENT-MODE D-MOS FET
ULTRA HIGH-SPEED LOW-COST SWITCH**

ORDERING INFORMATION

TO-92 Plastic Package	TZ404BD
SOT-89 Surface Mount Package	TZ404CY
Description	20V, 8 ohm

FEATURES

- Reliable, Low Cost, Plastic Package
- High Speed Switching, $t_r < 2nSec$
- Low Capacitance, c_{rss} 1.2 pF typ
- CMOS and TTL Compatible Input
- Available in Surface Mount Package

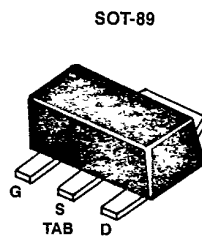
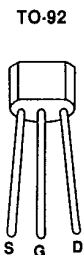
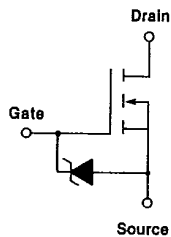
APPLICATIONS

- Switch Drivers
- Video Switches
- VHF/UHF Amplifiers

ABSOLUTE MAXIMUM RATINGS ($T_A = +25^\circ C$ unless otherwise specified)

Drain-Source Voltage	+20V	Peak Pulsed Drain Current	+0.8A
Gate-Source Voltage	-0.3V	Continuous Drain Current	100mA
	+20V	Power Dissipation (at or below $T_A = +25^\circ C$)	300mW
Gate-Drain Voltage	-0.3V	Linear Derating Factor	3.0mW/ $^\circ C$
	+20V	Operating Junction and	
Source-Drain Voltage	-0.3V	Storage Temperature Range	-40 $^\circ C$ to +125 $^\circ C$

PIN CONFIGURATIONS



**PACKAGE DIMENSIONS
TO-92**

TO-226AA (TO-92)
See Package 5

TO-243AA (SOT-89)
See Package 23

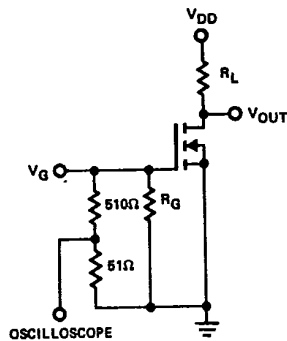
T-35-25

ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$ unless otherwise specified)

CHARACTERISTIC		MIN	TYP	MAX	UNIT	TEST CONDITION
STATIC	BV_{DS} Drain-Source Breakdown Voltage	20	25		V	$I_D = 1.0\mu\text{A}, V_{GS} = 0$
	$I_{D(off)}$ Drain-Source OFF Leakage Current			1.0	μA	$V_{DS} = 15\text{V}, V_{GS} = 0$
	I_{GSS} Gate-Source Leakage Current			10	μA	$V_{GS} = 20\text{V}, V_{DS} = 0$
	$I_{D(on)}$ Drain-Source ON Current	0.8	1.2		A	$V_{DS} = 10\text{V}, V_{GS} = 10\text{V}$ (Note 1)
	$V_{GS(th)}$ Gate-Source Threshold Voltage	0.7	1.1	1.5	V	$I_D = 1.0\mu\text{A}, V_{DS} = V_{GS}$
	$V_{DS(on)}$ Drain-Source ON Voltage			200	mV	(Note 1)
	$r_{DS(on)}$ Drain-Source ON Resistance			20	ohms	
	$V_{DS(on)}$ Drain-Source ON Voltage			800	mV	
	$r_{DS(on)}$ Drain-Source ON Resistance			8.0	ohms	
DYNAMIC	g_{fs} Common-Source Forward Transcond.	100			mmhos	$I_D = 0.3\text{A}, V_{DS} = 20\text{V}$ $f = 1\text{KHz}$
	C_{iss} Common-Source Input Capacitance		12	18	pf	$V_{DS} = 20\text{V}, V_{GS} = 0$ $f = 1\text{MHz}$
	C_{oss} Common-Source Output Capacitance		6.0	8.0		
	C_{rss} Common-Source Reverse Transfer Capacitance		1.2	2.0		
	$t_{d(on)}$ Turn ON Delay Time		1.0	1.5	nS	$V_{DD} = 10\text{V}, R_L = 390\Omega$ $V_{G(on)} = 10\text{V}, R_G = 51\Omega$ $C_L = 1.5\text{pF}$
	t_r Rise Time		1.0	2.0		
t_{off} Turn OFF Time		1.0				

Note 1: Pulse Test, 80 μ Sec, 1% Duty Cycle

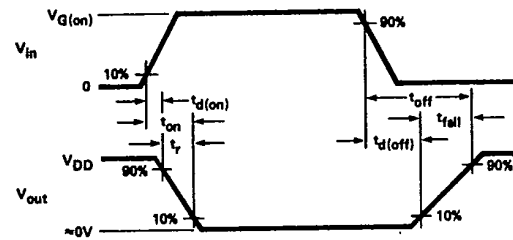
SWITCHING TIMES TEST CIRCUIT



INPUT PULSE
 $t_r < 0.5 \text{ nSEC}$
PULSE WIDTH - 100 nSEC

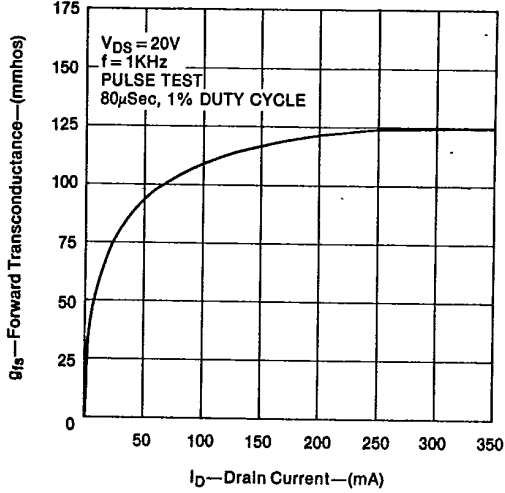
SAMPLING OSCILLOSCOPE
 $t_r < 0.36 \text{ nSEC}$
 $R_{in} > 1\text{M}\Omega$
 $C_{in} < 2.0 \text{ pF}$

TEST WAVEFORMS

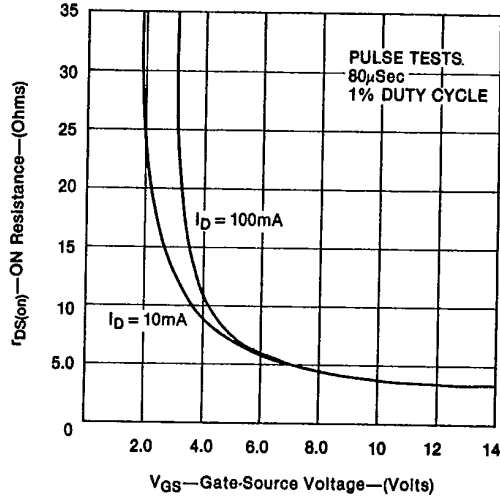


TYPICAL PERFORMANCE CHARACTERISTICS ($T_A = +25^\circ\text{C}$ unless otherwise specified)

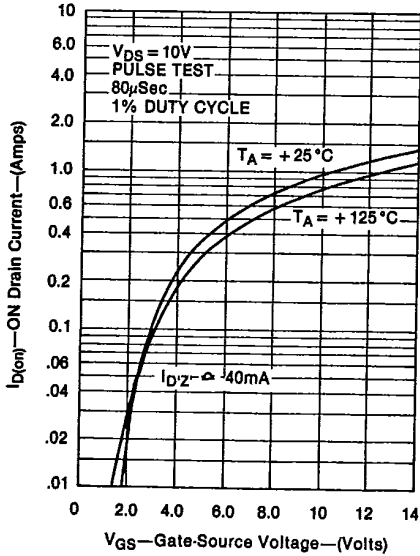
FORWARD TRANSCONDUCTANCE
—vs—
ON DRAIN CURRENT



DRAIN-SOURCE ON RESISTANCE
—vs—
GATE-SOURCE VOLTAGE



ON DRAIN CURRENT
—vs—
GATE-SOURCE VOLTAGE



CAPACITANCES
—vs—
DRAIN-SOURCE VOLTAGE

