

# MOS FIELD EFFECT TRANSISTOR

## 2SJ325, 325-Z

### SWITCHING P-CHANNEL POWER MOS FET

#### DESCRIPTION

The 2SJ325 is P-channel MOS Field Effect Transistor designed for solenoid, motor and lamp driver.

#### FEATURES

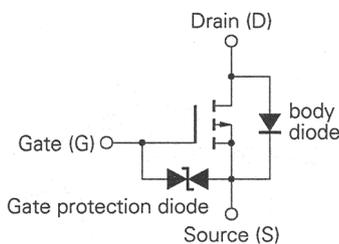
- Low On-state Resistance  
 $R_{DS(on)} = 0.08 \Omega$  TYP. ( $V_{GS} = -10 V, I_D = -2.0 A$ )  
 $R_{DS(on)} = 0.15 \Omega$  TYP. ( $V_{GS} = -4 V, I_D = -1.6 A$ )
- Low  $C_{iss}$ :  $C_{iss} = 800 pF$  TYP.
- Built-in G-S Gate Protection Diode

#### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ )

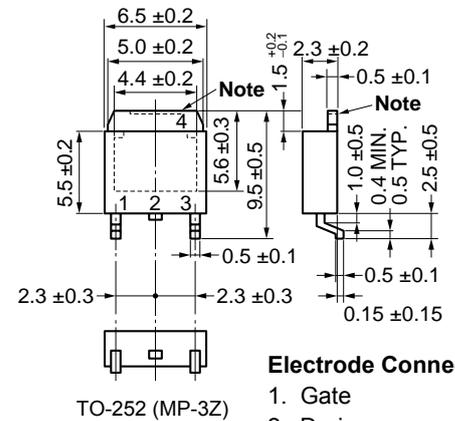
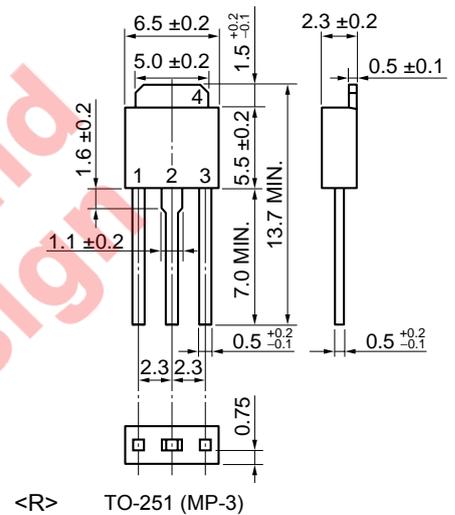
Drain to Source Voltage	$V_{DSS}$	-30	V
Gate to Source Voltage (AC)	$V_{GSS(AC)}$	$\pm 20$	V
Gate to Source Voltage (DC)	$V_{GSS(DC)}$	-20, +10	V
Drain Current (DC)	$I_{D(DC)}$	$\pm 4.0$	A
Drain Current (pulse) <sup>Note</sup>	$I_{D(pulse)}$	$\pm 16$	A
Total Power Dissipation ( $T_C = 25^\circ C$ )	$P_{T1}$	20	W
Total Power Dissipation ( $T_A = 25^\circ C$ )	$P_{T2}$	1.0	W
Channel Temperature	$T_{ch}$	150	$^\circ C$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ C$

**Note**  $PW \leq 10 \mu s$ , Duty Cycle  $\leq 1\%$

#### EQUIVALENT CIRCUIT



#### PACKAGE DRAWINGS (Unit: mm)



#### Electrode Connection

1. Gate
2. Drain
3. Source
4. Drain Fin

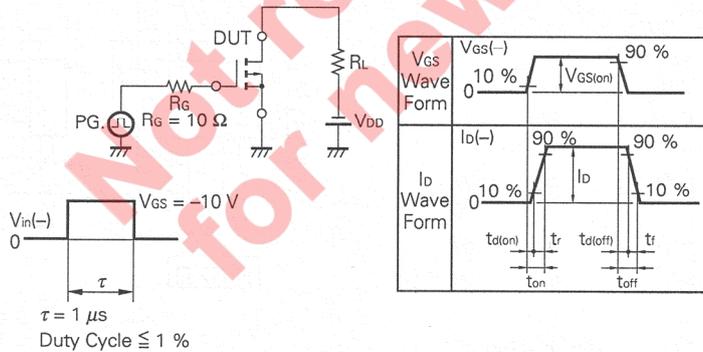
**Note** The depth of notch at the top of the fin is from 0 to 0.2 mm.

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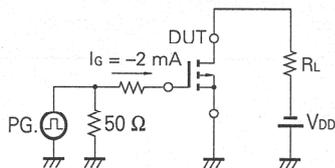
ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	R <sub>DS(on)</sub>		0.08	0.11	Ω	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -2.0 A
Drain to Source On-state Resistance	R <sub>DS(on)</sub>		0.15	0.24	Ω	V <sub>GS</sub> = -4 V, I <sub>D</sub> = -1.6 A
Gate to Source Cutoff Voltage	V <sub>GS(off)</sub>	-1.0	-1.5	-2.0	V	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -1 mA
Forward Transfer Admittance	y <sub>fs</sub>	3.0	4.2		S	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -2.0 A
Drain Leakage Current	I <sub>DSS</sub>			-10	μA	V <sub>DS</sub> = -30 V, V <sub>GS</sub> = 0
Gate to Source Leakage Current	I <sub>GSS</sub>			±10	μA	V <sub>GS</sub> = ±16 V, V <sub>DS</sub> = 0
Input Capacitance	C <sub>iss</sub>		800		pF	V <sub>DS</sub> = -10 V V <sub>GS</sub> = 0 f = 1 MHz
Output Capacitance	C <sub>oss</sub>		600		pF	
Reverse Transfer Capacitance	C <sub>rs</sub>		250		pF	
Turn-On Delay Time	t <sub>d(on)</sub>		15		ns	V <sub>GS(on)</sub> = -10 V V <sub>DD</sub> = -15 V I <sub>D</sub> = -2.0 A, R <sub>G</sub> = 10 Ω R <sub>L</sub> = 7.5 Ω
Rise Time	t <sub>r</sub>		65		ns	
Turn-Off Delay Time	t <sub>d(off)</sub>		85		ns	
Fall Time	t <sub>f</sub>		60		ns	
Total Gate Charge	Q <sub>G</sub>		28		nC	V <sub>GS</sub> = -10 V I <sub>D</sub> = -4.0 A V <sub>DD</sub> = -24 V
Gate to Source Charge	Q <sub>GS</sub>		3		nC	
Gate to Drain Charge	Q <sub>GD</sub>		11		nC	
Body Diode Forward Voltage	V <sub>F</sub>		0.9		V	I <sub>F</sub> = 4.0 A, V <sub>GS</sub> = 0
Reverse Recovery Time	t <sub>rr</sub>		65		ns	I <sub>F</sub> = 4.0 A, V <sub>GS</sub> = 0
Reverse Recovery Charge	Q <sub>rr</sub>		60		nC	di/dt = 50 A/μs

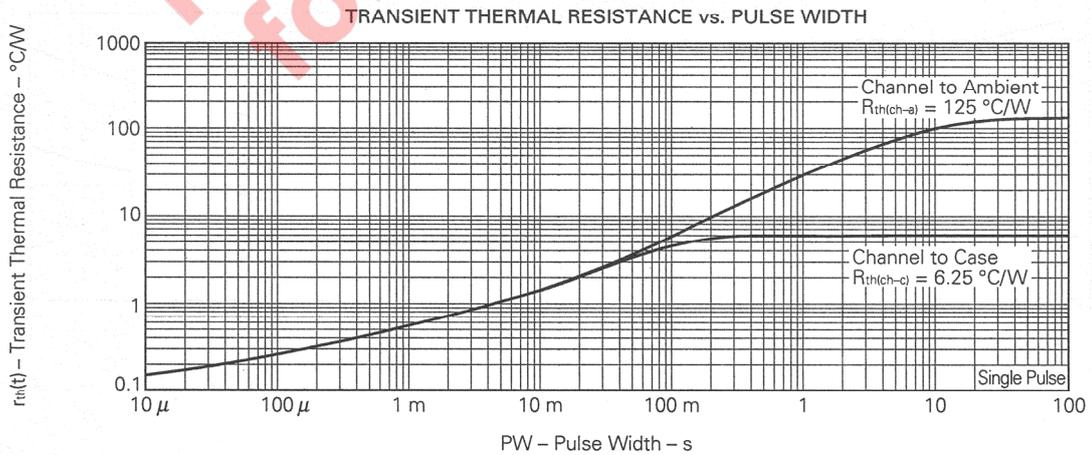
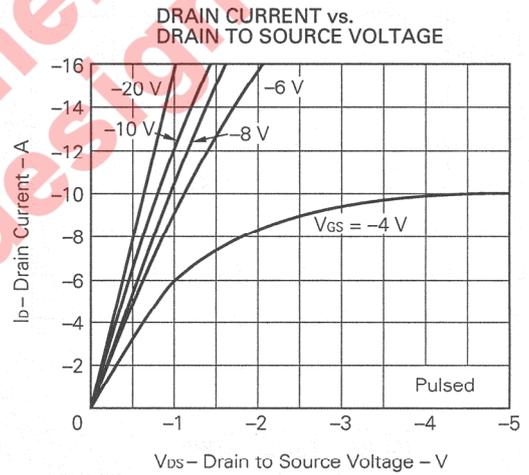
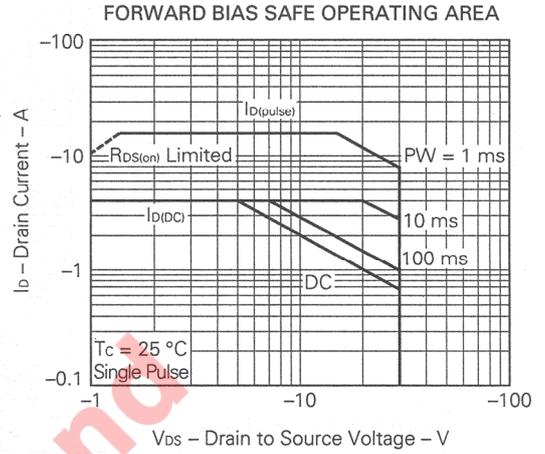
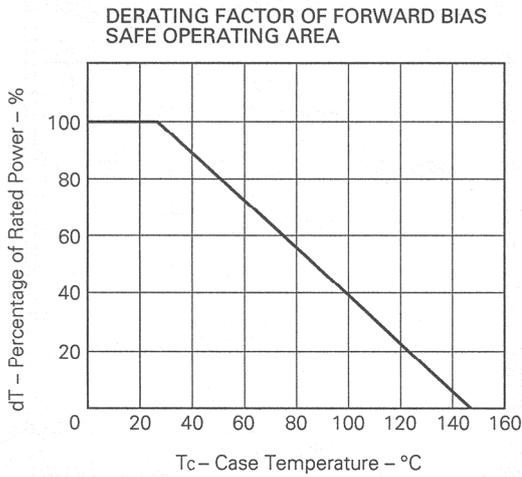
Test Circuit 1: Switching Time

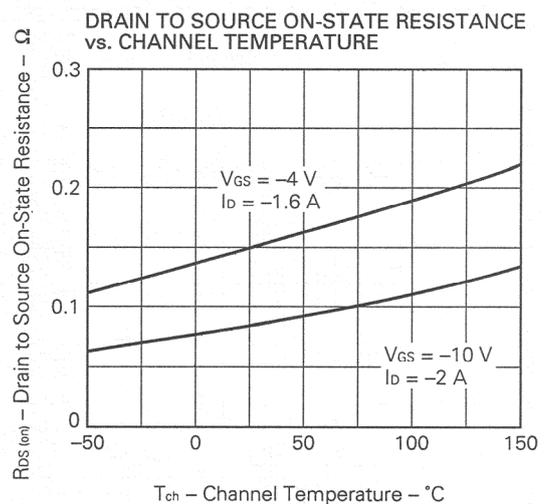
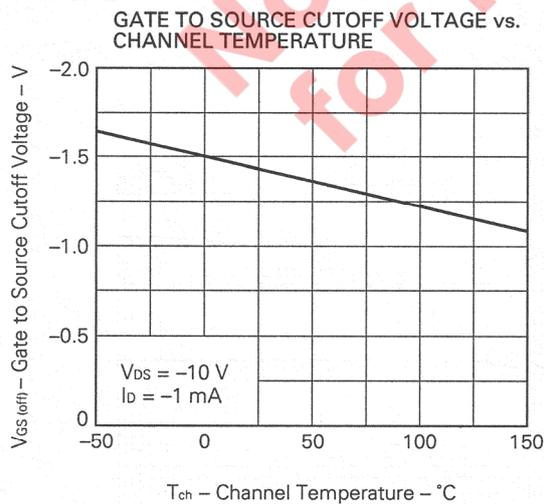
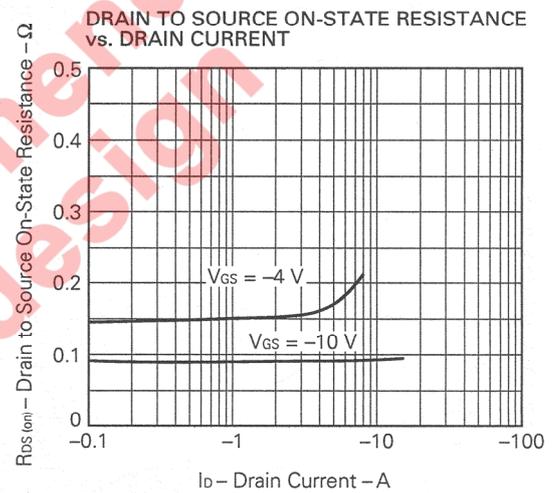
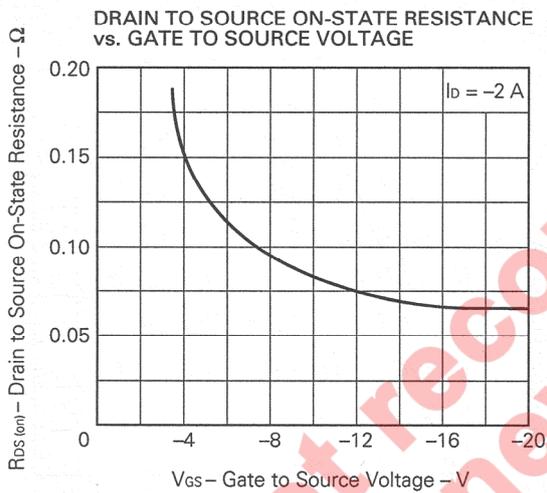
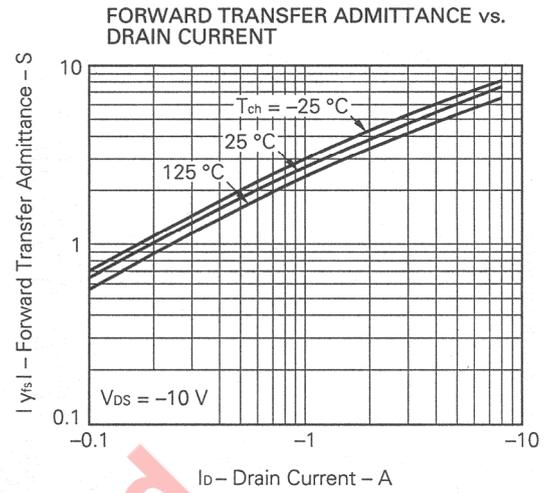
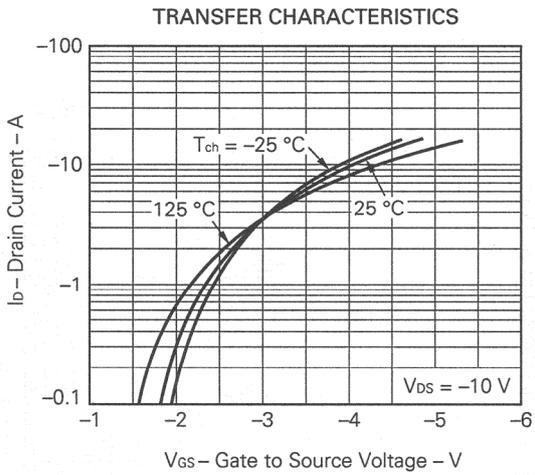


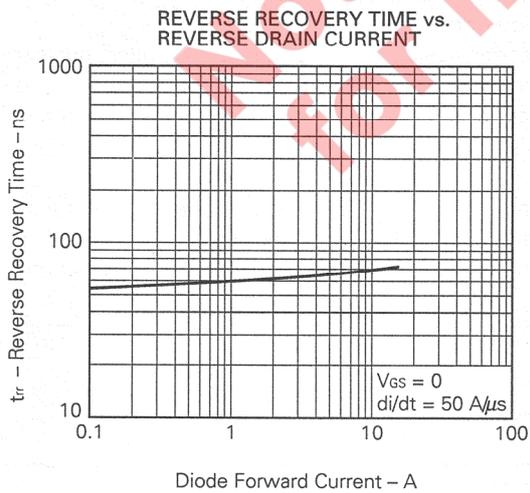
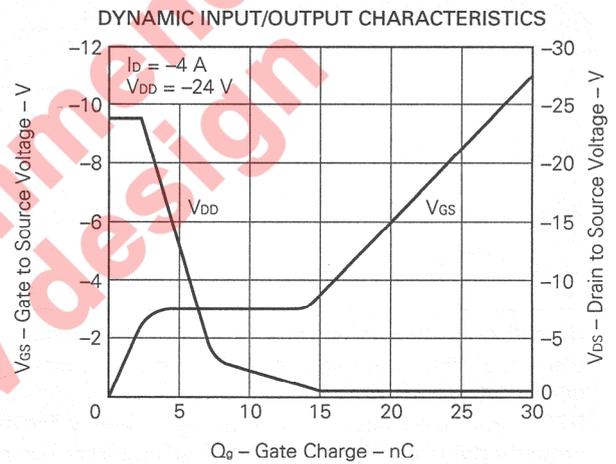
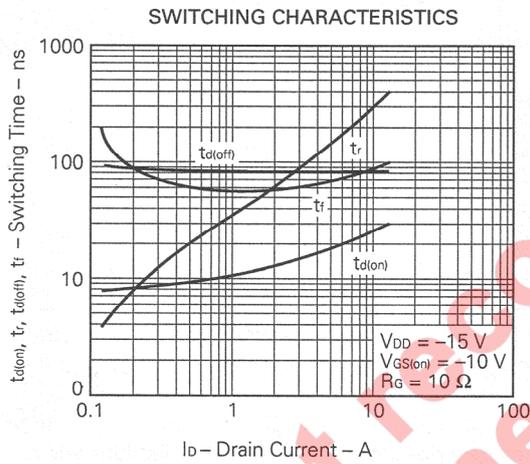
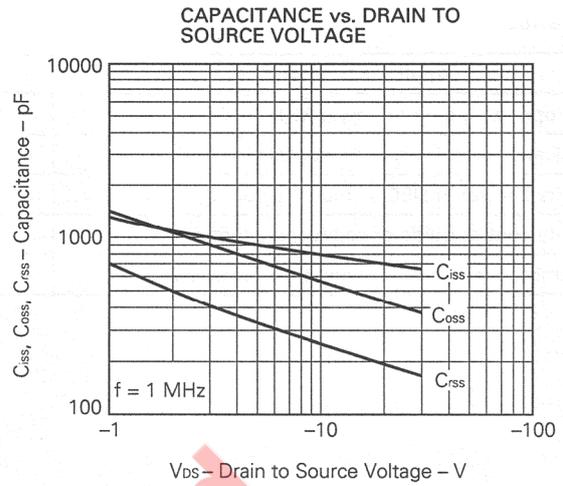
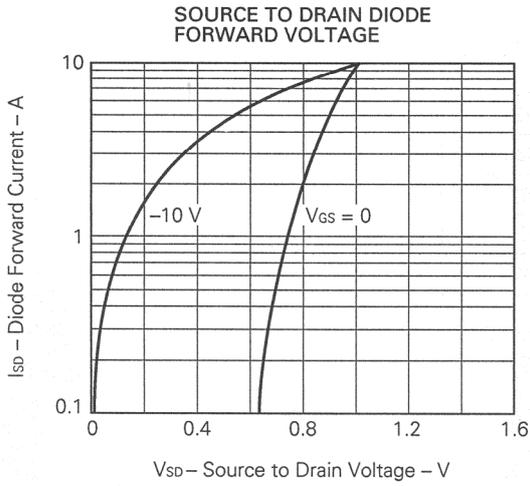
Test Circuit 2: Gate Charge



TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)







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