TYPE 2N3966
N-CHANNEL SILICON JUNCTION FIELD-EFFECT TRANSISTOR

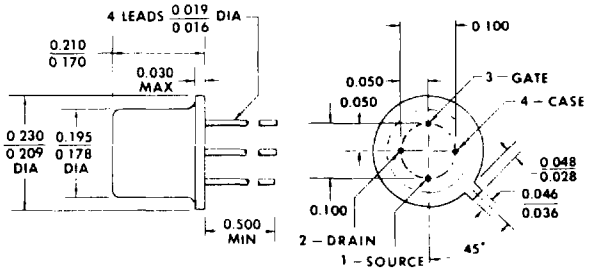
BULLETIN NO. DL-S 7011356, AUGUST 1970

FOR HIGH-SPEED COMMUTATOR AND CHOPPER APPLICATIONS

- Low $r_{ds(on)}$ . . . 220 Ω Max
- Low $I_{D(off)}$ . . . 1 nA Max
- Low C_{rss} . . . 1.5 pF Max

***mechanical data**

THE ACTIVE ELEMENTS ARE ELECTRICALLY INSULATED FROM THE CASE



ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

ALL JEDEC TO-72 DIMENSIONS AND NOTES ARE APPLICABLE

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***absolute maximum ratings at 25°C free-air temperature (unless otherwise noted)**

Drain-Gate Voltage	30 V
Drain-Source Voltage	30 V
Reverse Gate-Source Voltage	−30 V
Continuous Forward Gate Current	10 mA
Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 1)	300 mW
Storage Temperature Range	−55°C to 200°C
Lead Temperature 1/16 Inch from Case for 10 Seconds	300°C

***electrical characteristics at 25°C free-air temperature (unless otherwise noted)**

PARAMETER		TEST CONDITIONS†			MIN	MAX	UNIT
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	I_G = −1 μA,	V_{DS} = 0		−30		V
I_{GSS}	Gate Reverse Current	V_{GS} = −20 V,	V_{DS} = 0			−0.1	nA
I_{DGO}	Drain Reverse Current	V_{DG} = 20 V,	I_S = 0			0.1	nA
		V_{DG} = 20 V,	I_S = 0,	T_A = 150°C		0.2	μA
$I_{D(off)}$	Drain Cutoff Current	V_{DS} = 10 V,	V_{GS} = −7 V			1	nA
		V_{DS} = 10 V,	V_{GS} = −7 V,	T_A = 150°C		2	μA
$V_{GS(off)}$	Gate-Source Voltage	V_{DS} = 10 V,	I_D = 10 nA		−4	−6	V
I_{DSS}	Zero-Gate-Voltage Drain Current	V_{DS} = 20 V,	V_{GS} = 0		2		mA
$V_{DS(on)}$	Drain-Source On-State Voltage	V_{GS} = 0,	I_D = 1 mA			0.25	V
$r_{ds(on)}$	Small-Signal Drain-Source On-State Resistance	V_{GS} = 0,	I_D = 0,	f = 1 kHz		220	Ω
C_{iss}	Common-Source Short-Circuit Input Capacitance	V_{DS} = 20 V,	V_{GS} = 0,	f = 1 MHz		6	pF
C_{rss}	Common-Source Short-Circuit Reverse Transfer Capacitance	V_{DS} = 0,	V_{GS} = −7 V,	f = 1 MHz		1.5	pF

NOTE 1. Derate linearly to 200°C free-air temperature at the rate of 1.71 mW/°C.

*JEDEC registered data. This data sheet contains all applicable registered data in effect at the time of publication.

†The fourth lead (case) is connected to the source for all measurements.

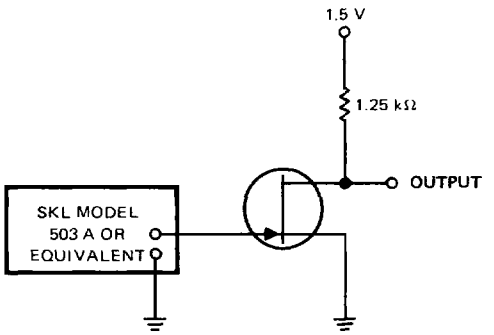
USES CHIP JN51

*switching characteristics at 25°C free-air temperature

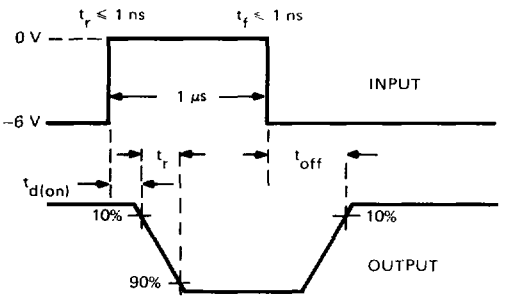
PARAMETER		TEST CONDITIONS†	MAX	UNIT
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 1.5 V, $I_{D(on)}$ = 1 mA,	20	ns
t_r	Rise Time	$V_{GS(on)}$ = 0, $V_{GS(off)}$ = −6 V,	100	ns
t_{off}	Turn-Off Time	See Figure 1	100	ns

†The fourth lead (case) is connected to the source for all measurements.

*PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

FIGURE 1–SWITCHING TIMES

NOTES: A. The input waveforms are supplied by a generator with the following characteristics: Z_{out} = 50 Ω, duty cycle ≤ 50%.
B. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 10$ ns, $R_{in} \geq 5$ MΩ, $C_{in} \leq 10$ pF.
*JEDEC registered data

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