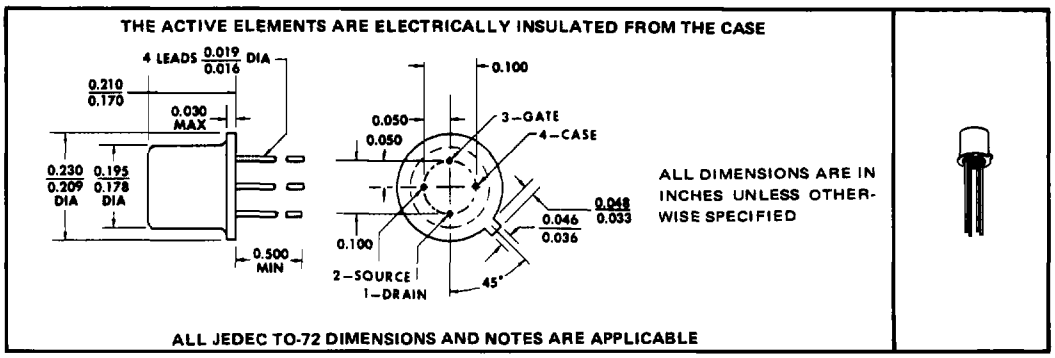
TYPES 2N5358 THRU 2N5364
N-CHANNEL SILICON JUNCTION FIELD-EFFECT TRANSISTORS

BULLETIN NO. DL-S 7111435, APRIL 1971

FOR SMALL-SIGNAL APPLICATIONS

- Narrow I_{DSS} and $V_{GS(off)}$ Ranges
- For Low-Noise Audio-Frequency Amplifier Applications
- For RF Amplifier Applications Thru 100 MHz
- For Chopper and Switching Applications

*mechanical data



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

Drain-Source Voltage	40 V
Reverse Gate-Source Voltage	−40 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	−65°C to 200°C
Lead Temperature 1/16 Inch from Case for 10 Seconds	300°C

NOTE 1: Derate linearly to 175°C free-air temperature at the rate of 2 mW/°C.

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

USES CHIP JN51

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 5012 • DALLAS, TEXAS 75222

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

PARAMETER		TEST CONDITIONS†			2N5358		2N5359		UNIT
					MIN	MAX	MIN	MAX	
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = -10\,\mu A$,	$V_{DS} = 0$		−40		−40		V
I_{GSS}	Gate Reverse Current	$V_{GS} = -20$ V,	$V_{DS} = 0$			−0.1		−0.1	nA
		$V_{GS} = -20$ V,	$V_{DS} = 0$,	$T_A = 150°C$		−0.1		−0.1	μA
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 15$ V,	$I_D = 100$ nA		−0.5	−3	−0.8	−4	V
V_{GS}	Gate-Source Voltage	$V_{DS} = 15$ V,	$I_D = 50\,\mu A$		−0.3	−1.5			V
		$V_{DS} = 15$ V,	$I_D = 80\,\mu A$				−0.4	−2	
I_{DSS}	Zero-Gate-Voltage Drain Current	$V_{DS} = 15$ V,	$V_{GS} = 0$,	See Note 2	0.5	1	0.8	1.6	mA
$\lvert y_{fs} \rvert$	Small-Signal Common-Source Forward Transfer Admittance	$V_{DS} = 15$ V, See Note 3	$V_{GS} = 0$,	f = 1 kHz,	1	3	1.2	3.6	mmho
$\lvert y_{os} \rvert$	Small-Signal Common-Source Output Admittance					10		10	μmho
C_{iss}	Common-Source Short-Circuit Input Capacitance	$V_{DS} = 15$ V, See Note 3	$V_{GS} = 0$,	f = 1 MHz,		6		6	pF
C_{rss}	Common-Source Short-Circuit Reverse Transfer Capacitance					2		2	pF
g_{fs}	Small-Signal Common-Source Forward Transfer Conductance	$V_{DS} = 15$ V, See Note 3	$V_{GS} = 0$,	f = 100 MHz	0.8		0.9		mmho

4

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

PARAMETER		TEST CONDITIONS†			2N5360		2N5361		UNIT
					MIN	MAX	MIN	MAX	
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = -10\,\mu A$,	$V_{DS} = 0$		−40		−40		V
I_{GSS}	Gate Reverse Current	$V_{GS} = -20$ V,	$V_{DS} = 0$			−0.1		−0.1	nA
		$V_{GS} = -20$ V,	$V_{DS} = 0$,	$T_A = 150°C$		−0.1		−0.1	μA
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 15$ V,	$I_D = 100$ nA		−0.8	−4	−1	−6	V
V_{GS}	Gate-Source Voltage	$V_{DS} = 15$ V,	$I_D = 150\,\mu A$		−0.5	−2.5			V
		$V_{DS} = 15$ V,	$I_D = 250\,\mu A$				−1	−5	
I_{DSS}	Zero-Gate-Voltage Drain Current	$V_{DS} = 15$ V,	$V_{GS} = 0$,	See Note 2	1.5	3	2.5	5	mA
$\lvert y_{fs} \rvert$	Small-Signal Common-Source Forward Transfer Admittance	$V_{DS} = 15$ V, See Note 3	$V_{GS} = 0$,	f = 1 kHz,	1.4	4.2	1.5	4.5	mmho
$\lvert y_{os} \rvert$	Small-Signal Common-Source Output Admittance					20		20	μmho
C_{iss}	Common-Source Short-Circuit Input Capacitance	$V_{DS} = 15$ V, See Note 3	$V_{GS} = 0$,	f = 1 MHz,		6		6	pF
C_{rss}	Common-Source Short-Circuit Reverse Transfer Capacitance					2		2	pF
g_{fs}	Small-Signal Common-Source Forward Transfer Conductance	$V_{DS} = 15$ V, See Note 3	$V_{GS} = 0$,	f = 100 MHz,	1.4		1.7		mmho

NOTES: 2. This parameter must be measured using pulse techniques. $t_w = 300\,\mu s$, duty cycle ≤ 2%.
3. These parameters must be measured with bias conditions applied for less than 5 seconds to avoid overheating.

*JEDEC registered data

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

TYPES 2N5358 THRU 2N5364
N-CHANNEL SILICON JUNCTION FIELD-EFFECT TRANSISTORS

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

PARAMETER		TEST CONDITIONS†	2N5362		2N5363		2N5364		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = -10\ \mu A$, $V_{DS} = 0$	−40		−40		−40		V
I_{GSS}	Gate Reverse Current	$V_{GS} = -20$ V, $V_{DS} = 0$		−0.1		−0.1		−0.1	nA
		$V_{GS} = -20$ V, $V_{DS} = 0$, $T_A = 150°C$		−0.1		−0.1		−0.1	μA
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 15$ V, $I_D = 100$ nA	−2	−7	−2.5	−8	−2.5	−8	V
V_{GS}	Gate-Source Voltage	$V_{DS} = 15$ V, $I_D = 0.4$ mA	−1.3	−5					V
		$V_{DS} = 15$ V, $I_D = 0.7$ mA			−2	−6			
		$V_{DS} = 15$ V, $I_D = 0.9$ mA					−2	−6	
I_{DSS}	Zero-Gate-Voltage Drain Current	$V_{DS} = 15$ V, $V_{GS} = 0$, See Note 2	4	8	7	14	9	18	mA
$\lvert y_{fs} \rvert$	Small-Signal Common-Source Forward Transfer Admittance	$V_{DS} = 15$ V, $V_{GS} = 0$, f = 1 kHz, See Note 3	2	5.5	2.5	6	2.7	6.5	mmho
$\lvert y_{os} \rvert$	Small-Signal Common-Source Output Admittance			40		40		60	μmho
C_{iss}	Common-Source Short-Circuit Input Capacitance	$V_{DS} = 15$ V, $V_{GS} = 0$, f = 1 MHz, See Note 3		6		6		6	pF
C_{rss}	Common-Source Short-Circuit Reverse Transfer Capacitance			2		2		2	pF
g_{fs}	Small-Signal Common-Source Forward Transfer Conductance	$V_{DS} = 15$ V, $V_{GS} = 0$, f = 100 MHz, See Note 3	1.9		2.1		2.2		mmho

*operating characteristics at 25°C free-air temperature

PARAMETER		TEST CONDITIONS†	ALL TYPES		UNIT
			MIN	MAX	
NF	Common-Source Spot Noise Figure	$V_{DS} = 15$ V, $V_{GS} = 0$, f = 100 Hz, $R_G = 1$ MΩ, See Note 3		2.5	dB

NOTES: 2. This parameter must be measured using pulse techniques. $t_w = 300\ \mu s$, duty cycle ≤ 2%.

3. These parameters must be measured with bias conditions applied for less than 5 seconds to avoid overheating.

*JEDEC registered data

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

TYPICAL CHARACTERISTICS

GATE CUTOFF CURRENT vs FREE AIR TEMPERATURE

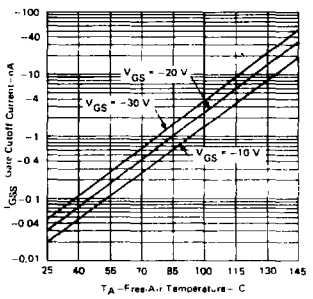


FIGURE 1

NOMINAL CHARACTERISTIC VALUES FOR NORMALIZED CURVES AT V_{DS} = 15 V, T_A = 25°C

PARAMETER	I_{DSS} (mA)	V_{GS} (V)	$\lvert y_{fs} \rvert$ (mmho)
Conditions	$V_{GS} = 0$	$I_D = 100\ \mu A$	$V_{GS} = 0$, f = 1 kHz
2N5362	6	−2.0	4.3
2N5363	10	−3.0	4.7
2N5364	15	−4.0	5.2

2N5362 THRU 2N5364

NORMALIZED SMALL-SIGNAL COMMON-SOURCE FORWARD TRANSFER ADMITTANCE vs NORMALIZED GATE-SOURCE VOLTAGE

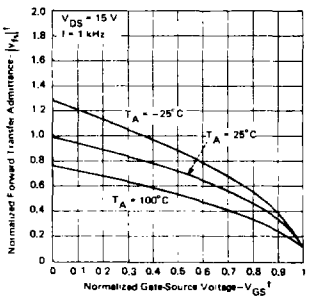


FIGURE 2

†Normalized $V_{GS} = \dfrac{V_{GS}}{V_{GS}\text{ at } I_D = 100\ \mu A,\ T_A = 25°C}$; Normalized $\lvert y_{fs} \rvert = \dfrac{\lvert y_{fs} \rvert}{\lvert y_{fs} \rvert \text{ at } V_{GS} = 0,\ T_A = 25°C}$

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 5012 • DALLAS, TEXAS 75222