New Jersey Semi-Conductor Products, Inc.

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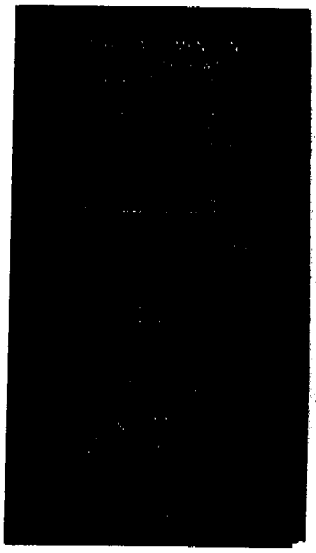
The **2N3277** and **2N3278** are P channel PLANAR field effect transistors designed for use in high-performance low-level circuits. These devices will find use where conversion to solid state circuits is desirable in cases that previously required vacuum tubes for high-impedance and low-noise characteristics. Typical 1 KC input impedance is 50 Meg ohms and 1 KC spot noise figure with a source resistance of 10 Meg ohms is 0.5 db. Applications for these devices include amplifiers for high-impedance transducers, photo-cell bridges, geiger counter and scintillator-counter heads and high-impedance differential amplifiers.



ABSOLUTE MAXIMUM RATINGS [Note 1]

Maximum Temperatures

Storage Temperature	**−65°C** to **+200°C**
Operating Junction Temperature	**175°C** Maximum
Lead Temperature (Soldering, 60 sec time limit)	**300°C** Maximum

Maximum Power Dissipation

Total Dissipation at or below 150°C Free Air Temperature [Note 3]	**22.5** mW

Maximum Voltages

BV_{SGO}	Source to Gate Breakdown Voltage	**−25** Volts
BV_{DSO}	Drain to Source Breakdown Voltage	**−25** Volts
BV_{DGO}	Drain to Gate Breakdown Voltage	**−25** Volts

ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)

		2N3277			2N3278				
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
BV_{DGO}	Drain to Gate Breakdown Voltage	**25**			**25**			Volts	$I_D = 1.0\ \mu A$ $I_S = 0$
I_G	Gate Reverse Current		**0.1**	**0.4**		**0.1**	**0.4**	nA	$V_{GS} = 10\ V$ $V_{DS} = 0$
I_D	Drain Current	**0.15**	**0.35**	**0.5**	**0.4**	**0.67**	**0.9**	mA	$V_{DS} = -10\ V$ $V_{GS} = 0$
V_{GS}	Gate Source Cutoff Voltage			**5.0**			**8.0**	Volts	$V_{DS} = -10\ V$ $I_D = 1.0$ nA
gm	Forward Transconductance (f = 1.0 kc)	**100**	**150**		**150**	**200**		μmhos	$V_{DS} = -10\ V$ $V_{GS} = 0$
C_{iss}	Input Capacitance (f = 1.0 mc)		**3.0**	**4.5**		**3.0**	**4.5**	pf	$V_{DS} = -10\ V$ $V_{GS} = 0$
E_N	Equivalent Input Noise Voltage (f = 1.0 kc) [Note 2]		**0.08**	**0.18**		**0.08**	**0.18**	$\mu V/\sqrt{cps}$	$V_{DS} = -10\ V$ $V_{GS} = 0$

Electrical Characteristics Continued on Page 2.

NOTES:

(1) These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.

(2) Power Bandwidth of 200 cps.

(3) This maximum power dissipation is determined by BV_{DSO} and I_D.

Quality Semi-Conductors

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2N3277 • 2N3278

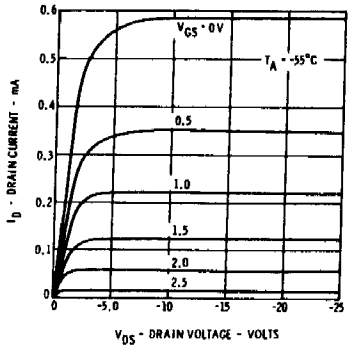
ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)

		2N3277			2N3278				
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	UNITS	TEST CONDITION
I_G (150°C)	Gate Reverse Current		0.07	0.5		0.07	0.5	μA	$V_{GS} = 10$ V, $V_{DS} = 0$
BV_{SGO}	Source to Gate Breakdown Voltage	25				25		Volts	$I_S = 1.0$ μA, $I_D = 0$
C_{DG}	Drain to Gate Capacitance (f = 1.0 mc)		1.2	1.5		1.2	1.5	pf	$V_{DS} = -10$ V, $V_{GS} = 0$
C_{GS}	Gate to Source Capacitance (f = 1.0 mc)		2.0	3.0		2.0	3.0	pf	$V_{DS} = -10$ V, $V_{GS} = 0$
C_{DS}	Drain to Source Capacitance (f = 1.0 mc)		0.5	1.0		0.5	1.0	pf	$V_{DS} = -10$ V, $V_{GS} = 0$
r_d	Drain Resistance (f = 1.0 mc)	0.5	1.0		0.1	0.4		MegΩ	$V_{DS} = -10$ V, $V_{GS} = 0$

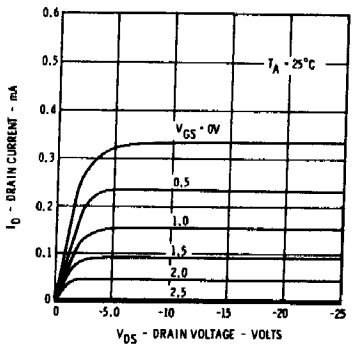
See Page 4 for Equivalent Circuit

TYPICAL 2N3277 ELECTRICAL CHARACTERISTICS

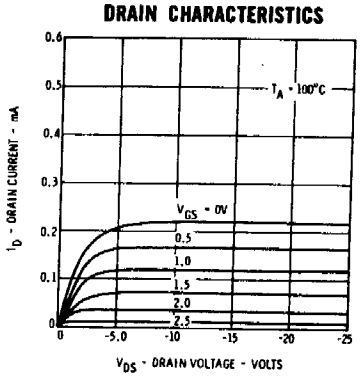
DRAIN CHARACTERISTICS



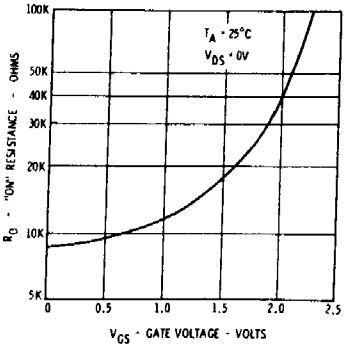
DRAIN CHARACTERISTICS



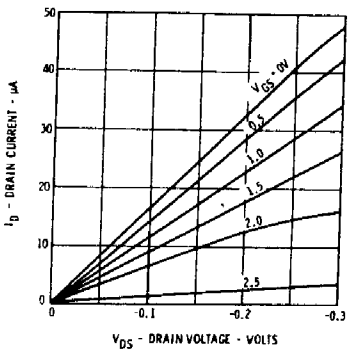
DRAIN CHARACTERISTICS



DRAIN "ON" RESISTANCE VERSUS GATE VOLTAGE



LOW VOLTAGE DRAIN CHARACTERISTICS



EQUIVALENT INPUT NOISE VOLTAGE VERSUS FREQUENCY