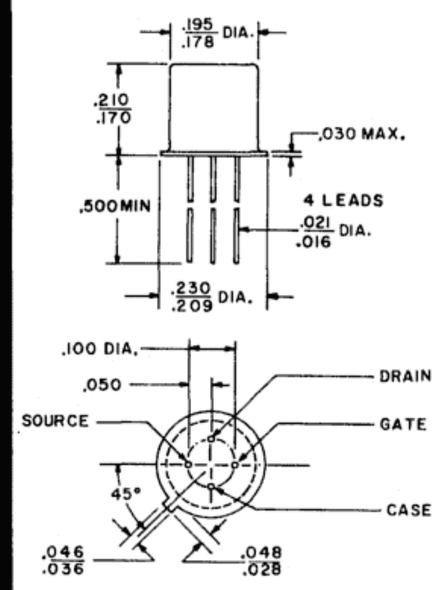
N-CHANNEL FIELD EFFECT TRANSISTOR
GENERAL PURPOSE

- LOW NOISE
- LOW CAPACITANCE
- FAST SWITCHING SPEEDS

JANUARY 1968

2N3966-69 THRU 2N3967A-69A



MAXIMUM RATINGS

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CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DS}	30	Volts
Drain-Gain Voltage	V_{DG}	30	Volts
Reverse Gate-Source Voltage	V_{GS}	30	Volts
Gate Current	I_G	10	mA
Total Device Dissipation @ $T_A = 25°C$	P_D	0.3	Watts
Derating Factor Above 25°C @ $T_A = 25°C$		1.71	mW/°C
Storage Temperature	T_{stg}	−65 to +200	°C
Junction Temperature	T_J	200	°C

ELECTRICAL CHARACTERISTICS at +25°C (Unless Otherwise Specified)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	MAX.	UNIT
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = 1.0\ \mu A$, $V_{DS} = 0$	30		Volts
Gate-Source Voltage	V_{GS}				
2N3967, 2N3967A		$V_{DS} = 20$ V, $I_D = 0.25$ mA	1.0	4.5	Volts
2N3968, 2N3968A		$V_{DS} = 20$ V, $I_D = 0.10$ mA	0.5	2.8	
2N3969, 2N3969A		$V_{DS} = 20$ V, $I_D = 0.04$ mA	0.3	1.6	
Gate-Source Cutoff Voltage	$V_{GS(OFF)}$				
2N3966		$V_{DS} = 10$ V, $I_D = 10$ nA	4.0	6.0	Volts
2N3967, 2N3967A		$V_{DS} = 20$ V, $I_D = 1.0$ nA	2.0	5.0	
2N3968, 2N3968A				3.0	
2N3969, 2N3969A				1.7	
Drain Cutoff Current	$I_{D(OFF)}$				
2N3966		$V_{DS} = 10$ V, $V_{GS} = -7.0$ V		1.0	nA
2N3966		$V_{DS} = 10$ V, $V_{GS} = -7.0$ V, $T_A = 150°C$		2.0	μA
Gate-Drain Leakage Current	I_{DGO}				
2N3966		$V_{DG} = 20$ V, $I_S = 0$		0.1	nA
2N3966		$V_{DG} = 20$ V, $I_D = 0$, $T_A = 150°C$		0.2	μA
Gate Reverse Current	I_{GSS}	$V_{GS} = 20$ V, $V_{DS} = 0$		0.1	nA
		$V_{GS} = 20$ V, $V_{DS} = 0$, $T_A = 150°C$		0.2	μA
Zero-Gate-Voltage Drain Current	I_{DSS}				
2N3966		$V_{DS} = 20$ V, $V_{GS} = 0$	2.0		mA
2N3967, 2N3967A			2.5	10	
2N3968, 2N3968A			1.0	5.0	
2N3969, 2N3969A			0.4	2.0	
Drain-Source "ON" Resistance	$r_{ds(ON)}$				
2N3966		$V_{DS} = 0$, $V_{GS} = 0$		220	Ohms
2N3967, 2N3967A		f = 1.0 kHz		400	
2N3968, 2N3968A				700	
Rise Time	t_r				
2N3966		See Figures 1 & 2		100	nsec
Turn-on Delay Time	t_d				
2N3966		See Figures 1 & 2		20	nsec
Turn-off Time	t_{off}				
2N3966		See Figures 1 & 2		100	nsec

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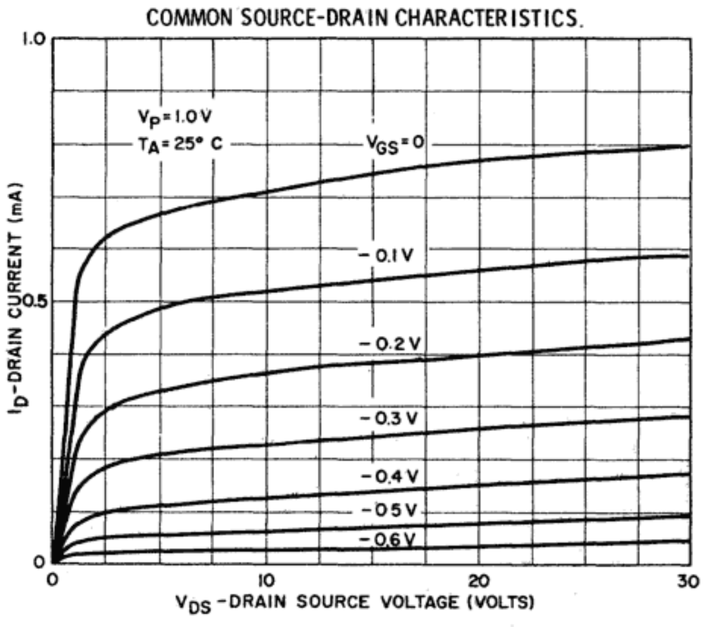
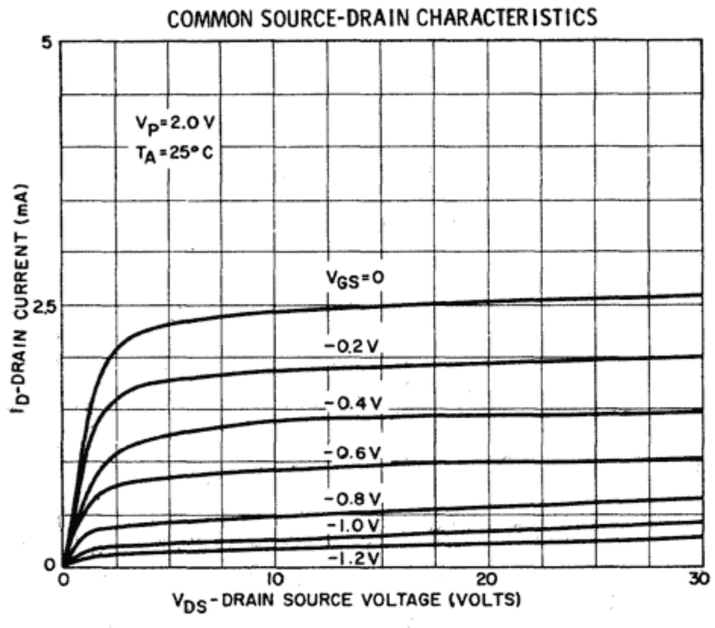
CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	MAX.	UNIT
Input Capacitance	C_{iss}				
2N3966		$V_{DS} = 20$ V, $V_{GS} = 0$ f = 1.0 MHz		6.0	pf
2N3967A		$V_{DS} = 20$ V, $I_D = 0.25$ mA f = 1.0 MHz		5.0	
2N3968A		$V_{DS} = 20$ V, $I_D = 0.10$ mA f = 1.0 MHz		5.0	
2N3969, 2N3969A		$V_{DS} = 20$ V, $I_D = 0.04$ mA f = 1.0 MHz		5.0	
Reverse Transfer Capacitance	C_{rss}				
2N3966		$V_{DS} = 0$, $V_{GS} = 7.0$ V f = 1.0 MHz		1.5	pf
2N3967, 2N3967A		$V_{DS} = 20$ V, $I_D = 1.0$ mA f = 1.0 MHz		1.3	
2N3968, 2N3968A		$V_{DS} = 20$ V, $I_D = 0.5$ mA f = 1.0 MHz		1.3	
2N3969, 2N3969A		$V_{DS} = 20$ V, $I_D = 0.2$ mA f = 1.0 MHz		1.3	
Transadmittance	Y_{fs}				
2N3967, 2N3967A		$V_{DS} = 20$ V, $V_{GS} = 0$ f = 1.0 kHz	2500		μmhos
2N3968, 2N3968A			2000		
2N3969, 2N3969A			1300		
Forward Transadmittance	Y_{fs}				
2N3967, 2N3967A		$V_{DS} = 20$ V, $I_D = 0.25$ mA	1600	2400	μmhos
2N3968, 2N3968A		$V_{DS} = 20$ V, $I_D = 0.10$ mA	1400	2000	
2N3969, 2N3969A		$V_{DS} = 20$ V, $I_D = 0.04$ mA	950	1450	
Forward Transadmittance	Y_{fs}				
2N3967, 2N3967A		$V_{DS} = 20$ V, $V_{GS} = 0$ f = 10 MHz	1600		μmhos
2N3968, 2N3968A			1400		
2N3969, 2N3969A			950		
Output Admittance	Y_{os}				
2N3967, 2N3967A		$V_{DS} = 20$ V, $I_D = 0.25$ mA f = 1.0 MHz		35	μmhos
2N3968, 2N3968A		$V_{DS} = 20$ V, $I_D = 0.10$ mA f = 1.0 MHz		15	
2N3969, 2N3969A		$V_{DS} = 20$ V, $I_D = 0.04$ mA f = 1.0 MHz		5.0	
Noise Figure	NF				
2N3967-2N3969A		$V_{DS} = 20$ V, $V_{GS} = 0$ $R_G = 1.0$ MΩ f = 100 Hz BW = 6 Hz		1.5	db
2N3967A, 68A, 69A		$V_{DS} = 10$ V, $V_{GS} = 0$ $R_G = 1.0$ MΩ f = 10 Hz BW = 6 Hz		4.0	
2N3967A, 68A, 69A		$V_{DS} = 10$ V, $V_{GS} = 0$ $R_G = 1.0$ MΩ f = 1.0 kHz BW = 200 Hz		1.0	

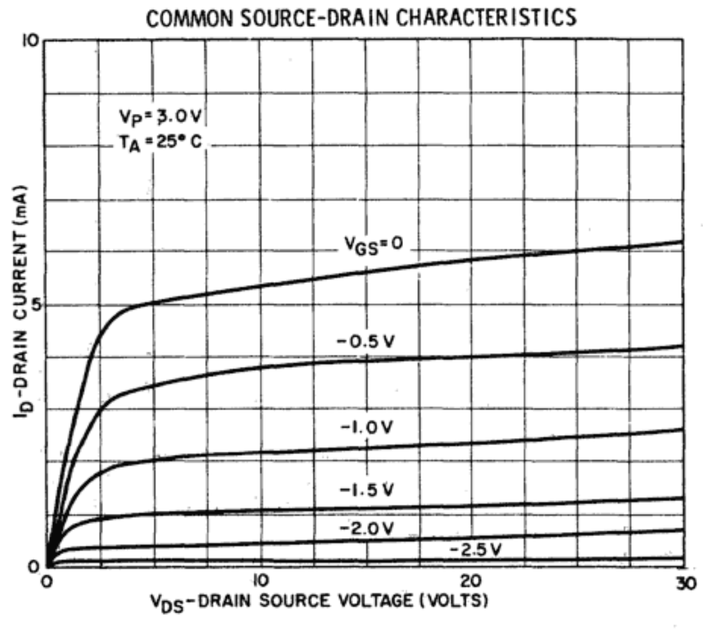
COMMON SOURCE-DRAIN CHARACTERISTICS.



COMMON SOURCE-DRAIN CHARACTERISTICS



COMMON SOURCE-DRAIN CHARACTERISTICS



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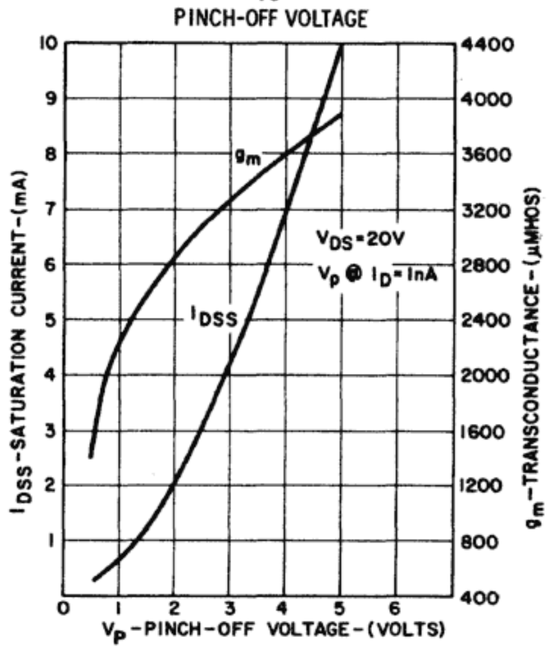
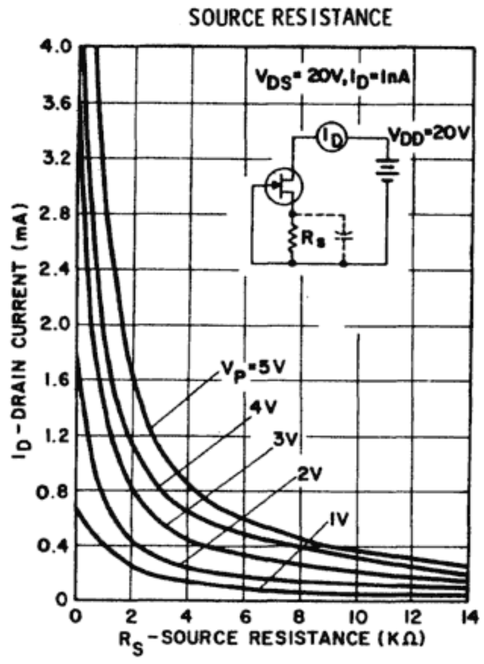
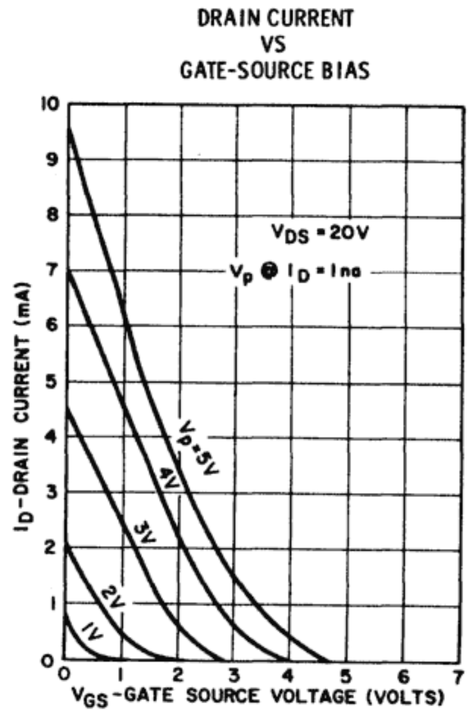
TRANSCONDUCTANCE
AND DRAIN CURRENT
VS
PINCH-OFF VOLTAGE



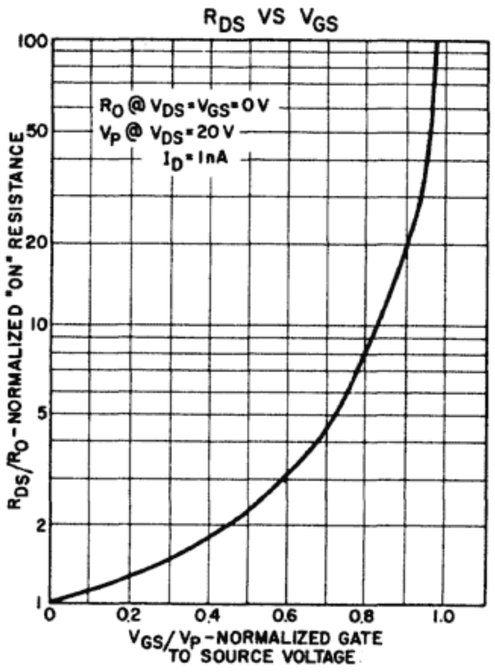
SOURCE FOLLOWER
DRAIN CURRENT
VS
SOURCE RESISTANCE



DRAIN CURRENT
VS
GATE-SOURCE BIAS



NORMALIZED
R_{DS} VS V_{GS}



TRANSCONDUCTANCE
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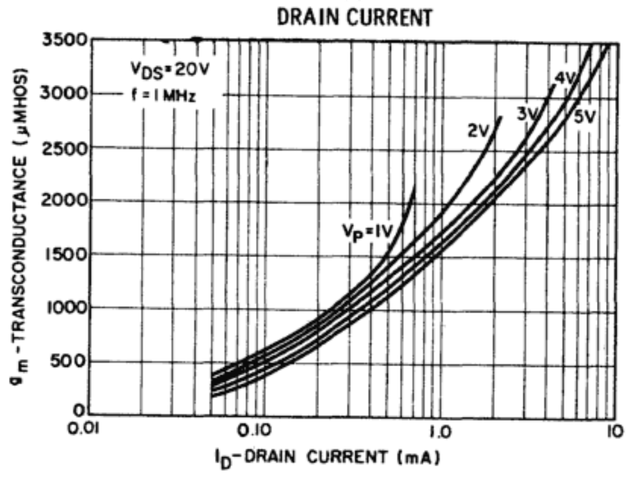
DRAIN CURRENT



GATE LEAKAGE CURRENT
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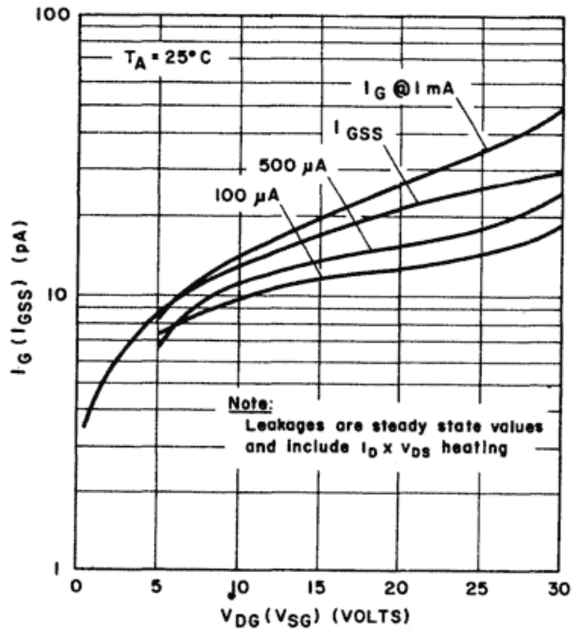
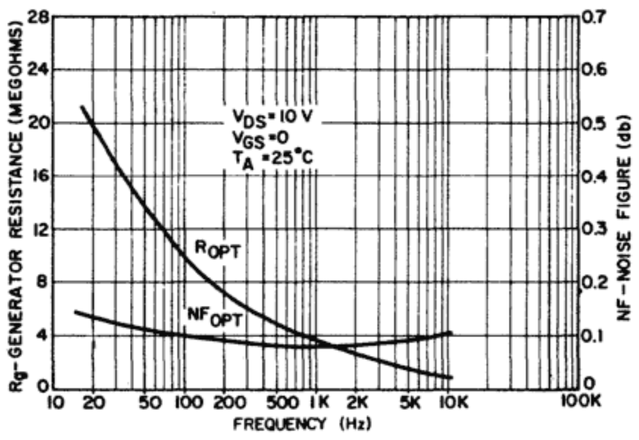
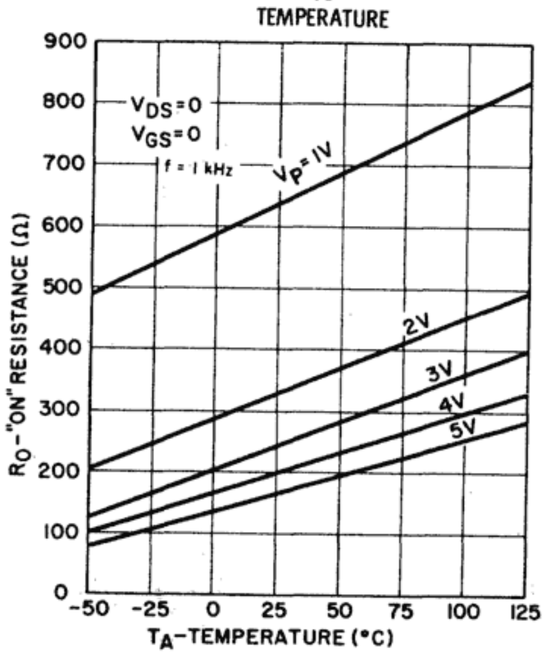
VOLTAGE



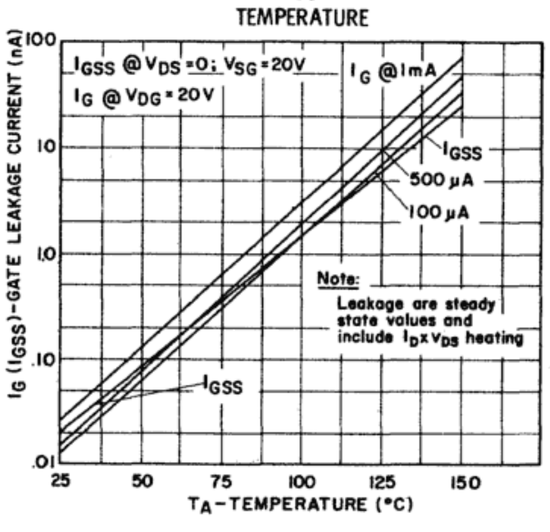
OPTIMUM GENERATOR RESISTANCE
AND
NOISE FIGURE



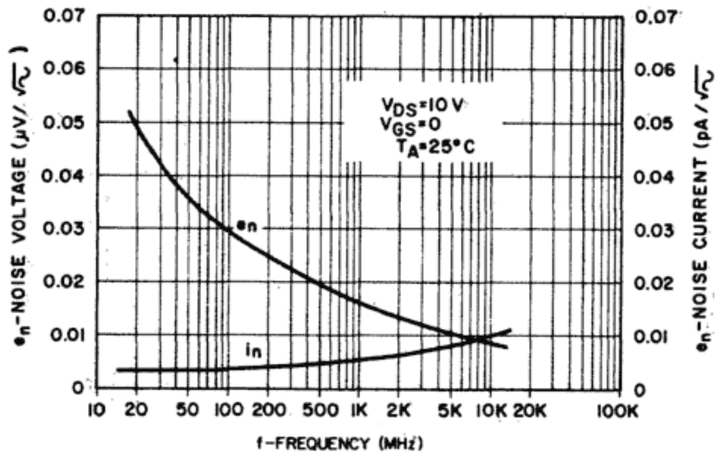
"ON" RESISTANCE
VS
TEMPERATURE



GATE LEAKAGE CURRENT
VS
TEMPERATURE



NOISE VOLTAGE/CURRENT
VS
FREQUENCY



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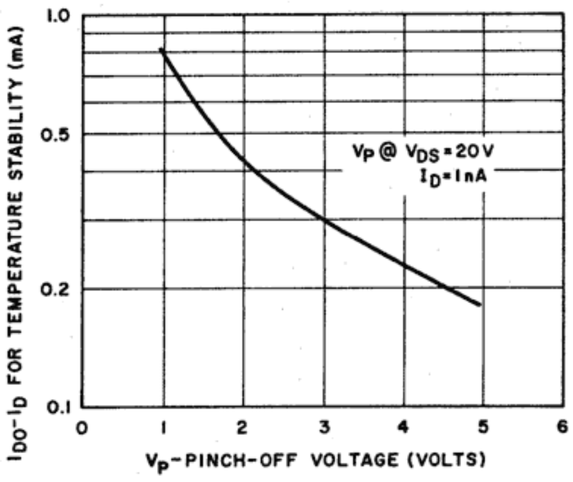
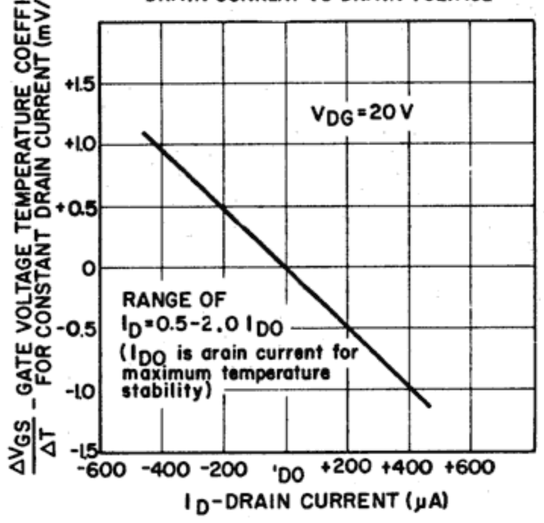
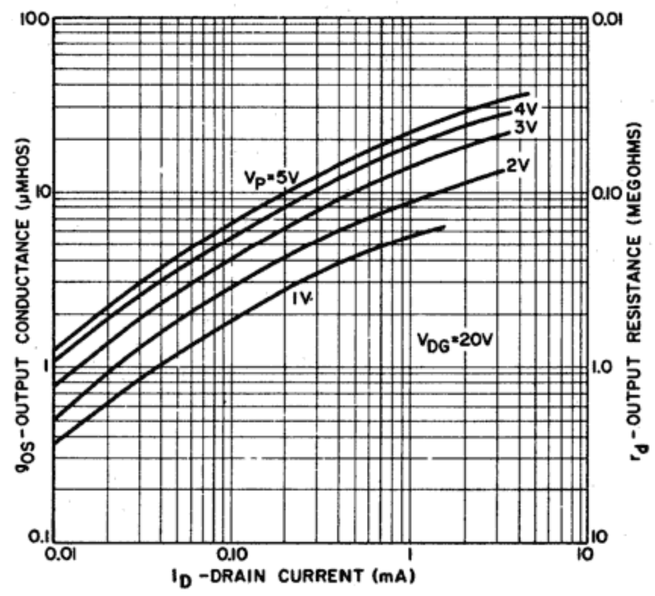
DRAIN CURRENT FOR MAXIMUM TEMPERATURE STABILITY



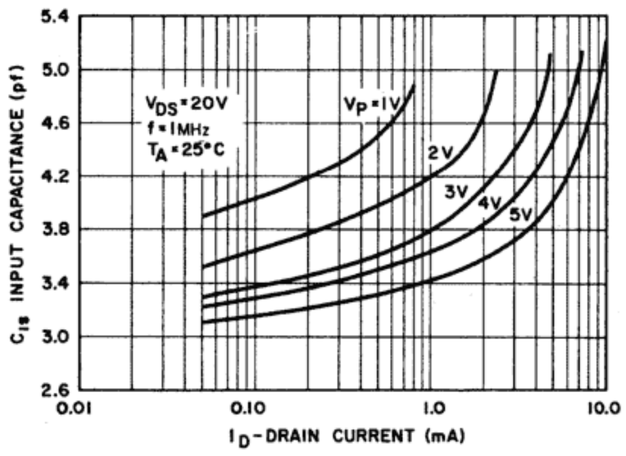
GATE VOLTAGE TEMPERATURE COEFFICIENTS FOR CONSTANT DRAIN CURRENT VS DRAIN VOLTAGE



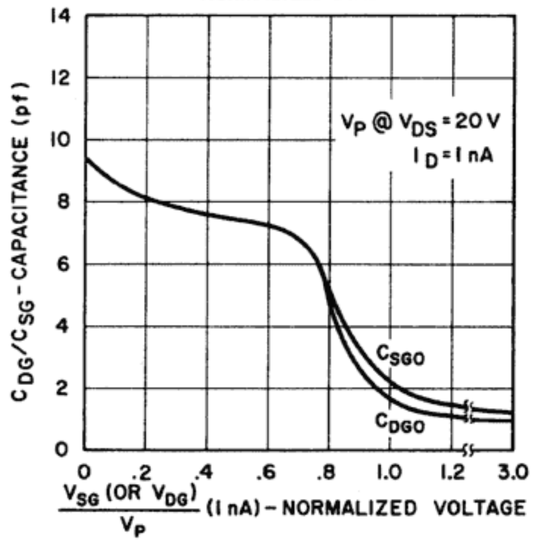
OUTPUT CONDUCTANCE VS DRAIN CURRENT



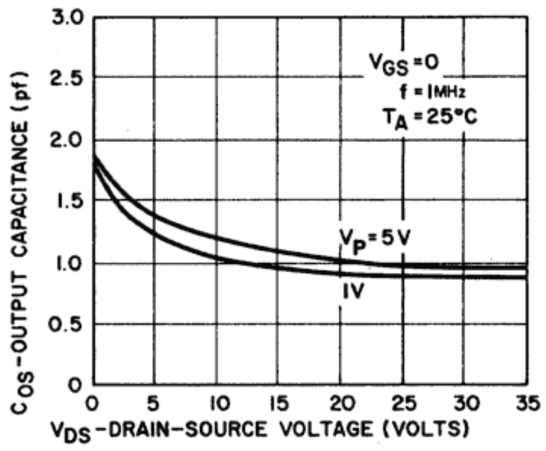
INPUT CAPACITANCE VS DRAIN CURRENT



JUNCTION CAPACITANCE VS NORMALIZED BIAS



OUTPUT CAPACITANCE VS DRAIN SOURCE VOLTAGE



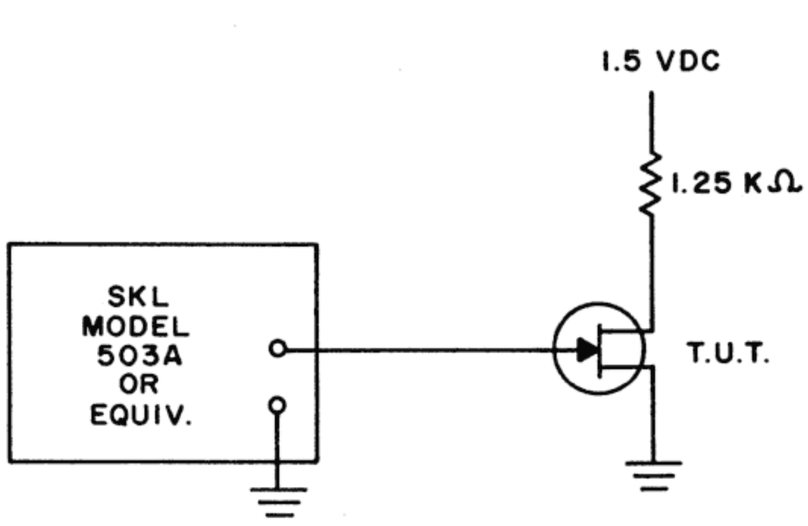


FIGURE 1

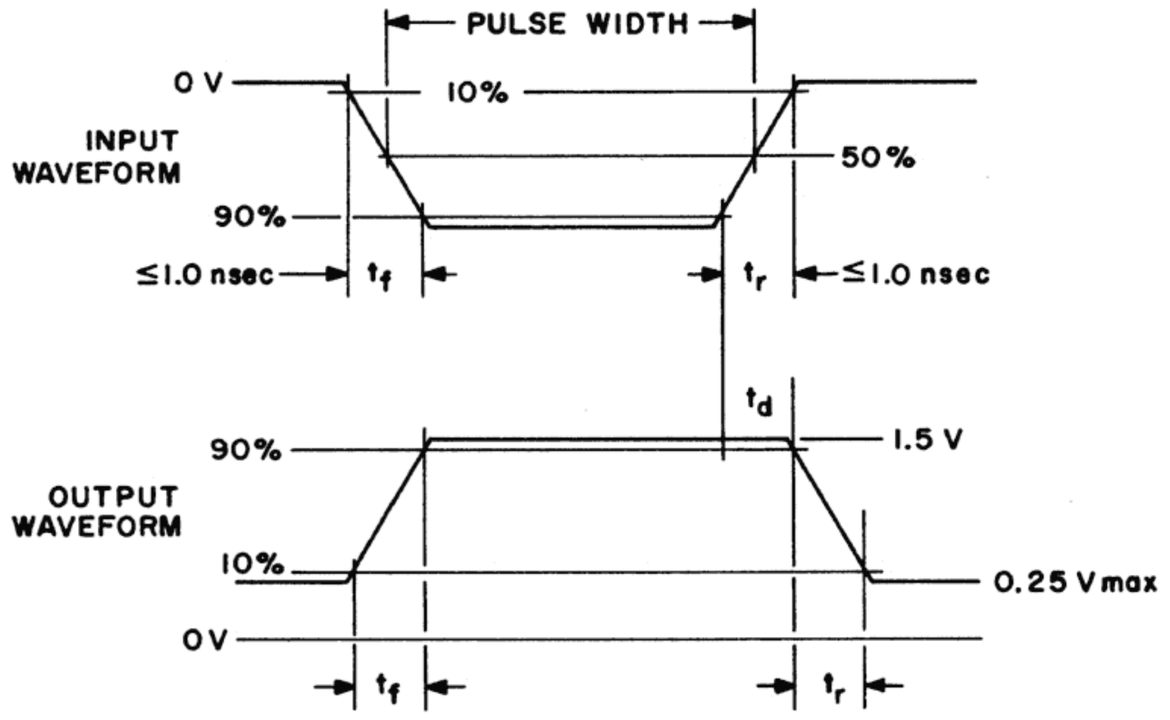


FIGURE 2

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