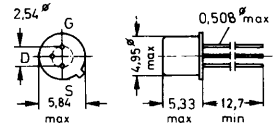
2N4977
2N4978
2N4979

Si-N-Kanal-Sperrschicht-Feldeffekt-Transistoren

Ausführung Metallgehäuse TO-18, Gate galvanisch mit dem Gehäuse verbunden.

Anwendung Vorwiegend für schnelle Schalter und Chopper.



TO 18 (0,32g)

Grenzwerte bei $T_U = 25^oC$

Drain-Source-Spannung	U_{DS}	30	V
Gate-Source-Spannung	$-U_{GS}$	30	V
Gate-Drain-Spannung	$-U_{GD}$	30	V
Gate-Strom	I_G	10	mA
Gesamtverlustleistung $T_U = 25^oC$ $T_G = 25^oC$	P_{tot}	0,3 1,8	W
Sperrschichttemperatur	T_j	200	^oC
Lagertemperatur	T_S	−55 . . . +200	^oC

Kennwerte bei $T_U = 25^oC$

Gate-Source-Strom	$-U_{GS} = 15$ V $I_D = 0$	$-I_{GSO}$		<0,5	nA
Gate-Drain-Strom	$-U_{GD} = 15$ V $I_S = 0$	$-I_{GDO}$		<0,5	nA
	$-U_{GD} = 15$ V $I_S = 0$ $T_U = 150^oC$	$-I_{GDO}$		<1	µA
Gate-Source-Reststrom	$U_{DS} = 0$ $-U_{GS} = 15$ V	$-I_{GSS}$		<0,5	nA
Gate-Source-Durchbruchspannung	$U_{DS} = 0$ $-I_{GS} = 1$ µA	$-U_{(BR)GSS}$		>30	V
Drain-Source-Sperrstrom	$U_{DS} = 15$ V $-U_{GS} = 12$ V	I_{DSX}		<0,5	nA
	$U_{DS} = 15$ V $-U_{GS} = 12$ V $T_U = 150^oC$	I_{DSX}		<1,5	µA
Drain-Strom	$U_{DS} = 20$ V $U_{GS} = 0$	I_{DSS} [1]	2 N 4977 2 N 4978 2 N 4979	>50 >15 >7,5	mA
Abschnürspannung	$U_{DS} = 15$ V $I_D = 1$ nA	$-U_{GS\ off}$	2 N 4977 2 N 4978 2 N 4979	4 . . . 10 2 . . . 8 0,5 . . . 5	V
Drain-Source-Sättigungsspannung	$U_{GS} = 0$ $I_D = 25$ mA	U_{DSsat}	2 N 4977	<0,4	V
	$U_{GS} = 0$ $I_D = 10$ mA	U_{DSsat}	2 N 4978	<0,4	V
	$U_{GS} = 0$ $I_D = 5$ mA	U_{DSsat}	2 N 4979	<0,4	V
Drain-Source-Durchlaßwiderstand	$U_{GS} = 0$ $I_D = 1$ mA	$r_{DS\ on}$	2 N 4977 2 N 4978 2 N 4979	<15 <20 <40	Ω
Kleinsignal-Drain- Source Durchlaßwiderstand	$U_{GS} = 0$ $I_D = 0$ f = 1 kHz	$r_{ds\ on}$	2 N 4977 2 N 4978 2 N 4979	<15 <20 <40	Ω

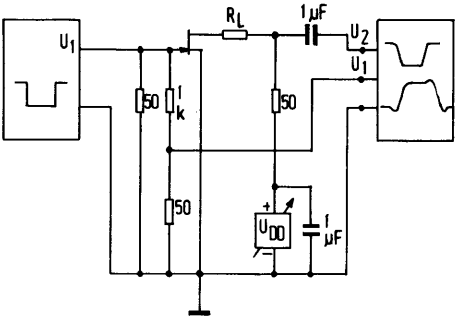
1) Impulsmessung: $t_p = 300$ µs, $\delta \leq 3$ %

Kennwerte bei $T_U = 25^oC$

Eingangskapazität	$U_{GS} = 0$ $f = 1$ MHz $U_{DS} = 0$	C_{11ss}		<60	pF
Rückwirkungskapazität	$U_{DS} = 0$ $-U_{GS} = 12$ V $f = 1$ MHz	C_{12ss}		<8	pF
Einschaltverzögerungszeit	$U_{DD} = 6$ V $U_{GS\ on} = 0$ $-U_{GSX} = 10$ V $I_{D\ on} \sim 25$ mA	$t_{d\ (on)}$	2 N 4977	<5	ns
Anstiegszeit		t_r		<5	
Ausschaltzeit		t_{off}		<20	
Einschaltverzögerungszeit	$U_{DD} = 6$ V $U_{GS\ on} = 0$ $-U_{GSX} = 8$ V $I_{D\ on} \sim 10$ mA	$t_{d\ (on)}$	2 N 4978	<5	ns
Anstiegszeit		t_r		<10	
Ausschaltzeit		t_{off}		<40	
Einschaltverzögerungszeit	$U_{DD} = 6$ V $U_{GS\ on} = 0$ $-U_{GSX} = 5$ V $I_{D\ on} \sim 5$ mA	$t_{d\ (on)}$	2 N 4979	<10	ns
Anstiegszeit		t_r		<30	
Ausschaltzeit		t_{off}		<60	

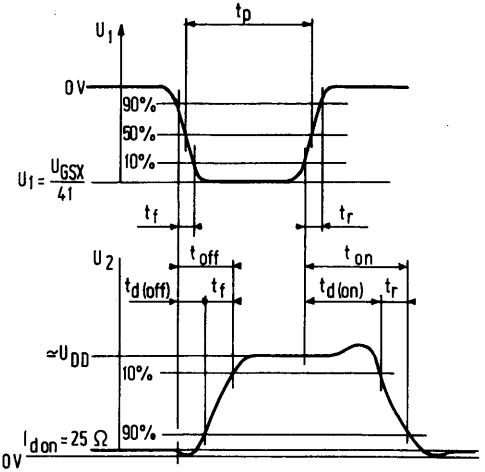
Meßschaltung für Schaltzeiten

Generator
$Z_0 = 50\ \Omega$
$t_r \leqslant 1$ ns
$t_f \leqslant 1$ ns
$t_p \approx 110$ ns
$\delta = 10\ \%$



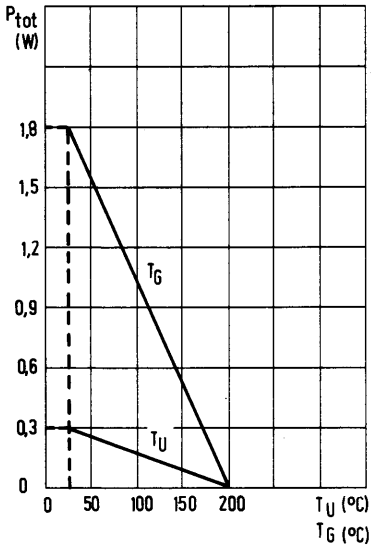
Oszilloskop
$Z_1 = 50\ \Omega$
$t_r \leqslant 0{,}4$ ns

2 N 4977 2 N 4978 2 N 4979	$-U_{GSX}$	10 V 8 V 5 V

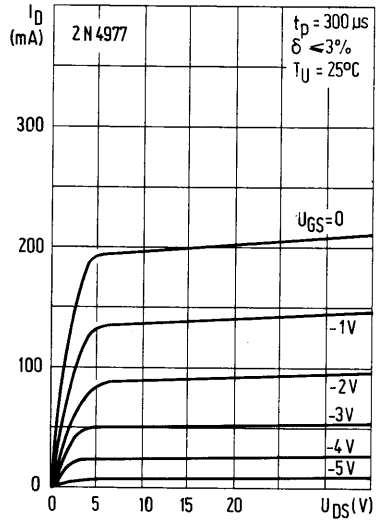


2 N 4977 2 N 4978 2 N 4979	$I_{D\,on}$ ~	25 mA 10 mA 5 mA

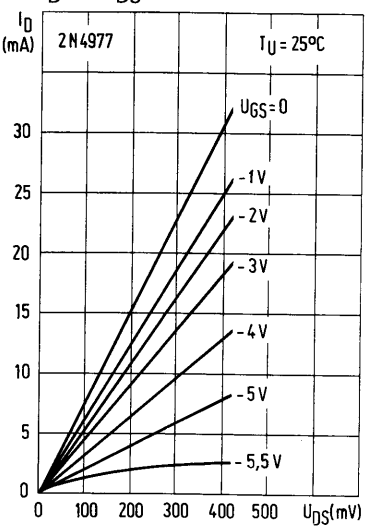
Temperaturabhängigkeit der Gesamtverlustleistung



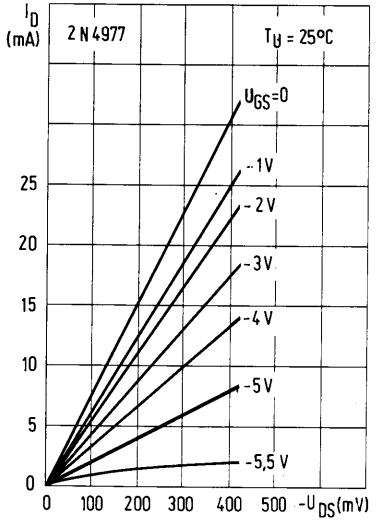
Drainstrom
$I_D = f(U_{DS})$



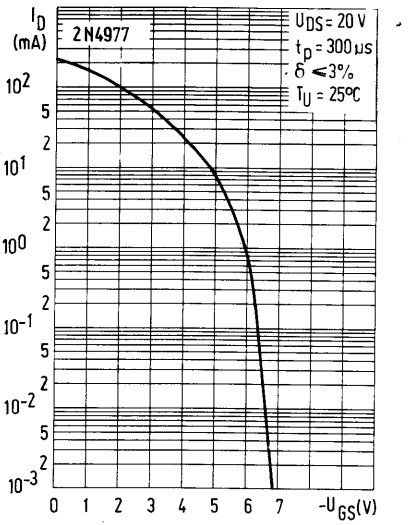
Drainstrom
$I_D = f(U_{DS})$



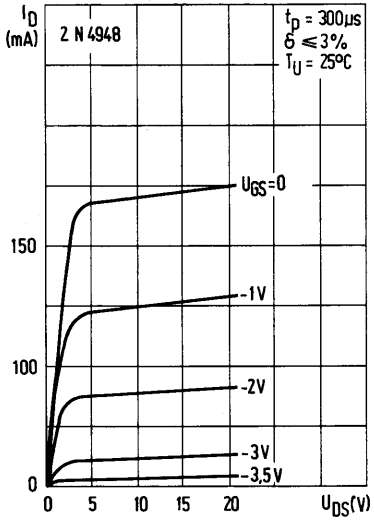
Drainstrom
$I_D = f(U_{DS})$



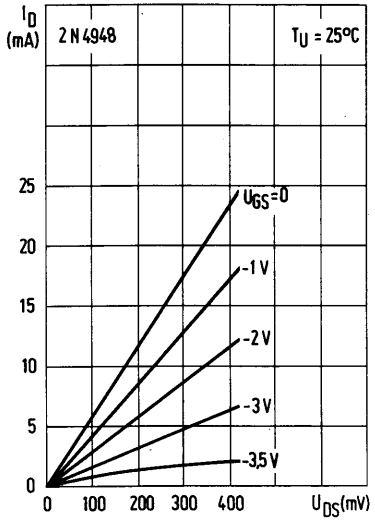
Drainstrom
$I_D = f(U_{GS})$



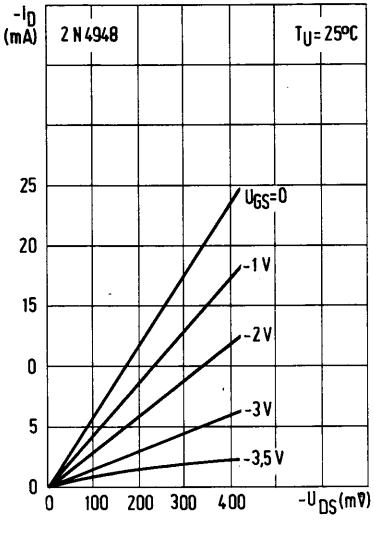
Drainstrom
$I_D = f(U_{DS})$



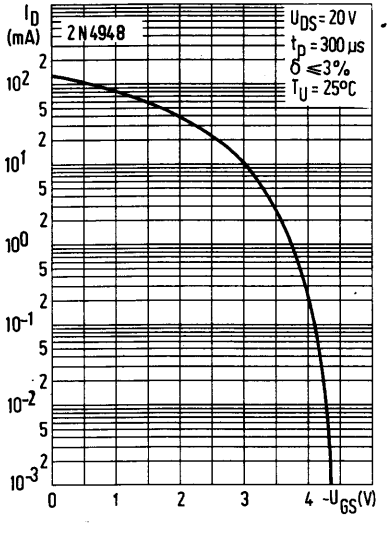
Drainstrom
$I_D = f(U_{DS})$



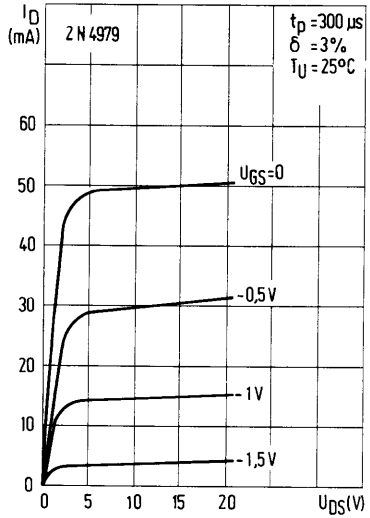
Drainstrom
$I_D = f(U_{DS})$



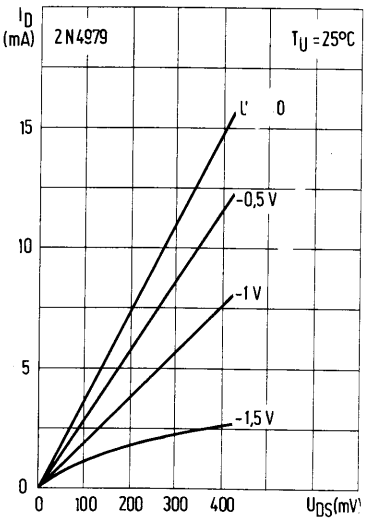
Drainstrom
$I_D = f(U_{GS})$



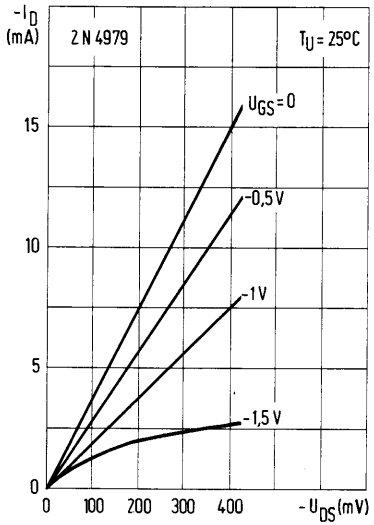
Drainstrom
$I_D = f(U_{DS})$



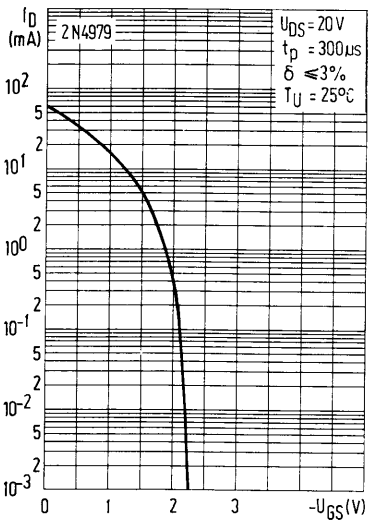
Drainstrom
$I_D = f(U_{DS})$



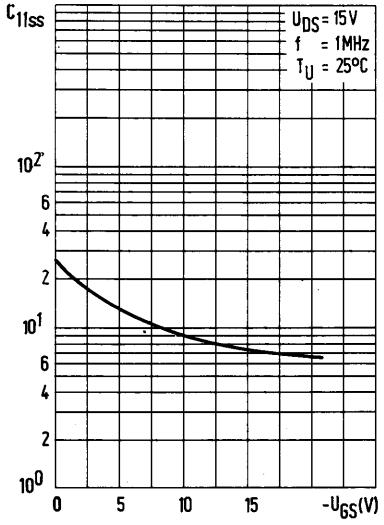
Drainstrom
$I_D = f(U_{DS})$



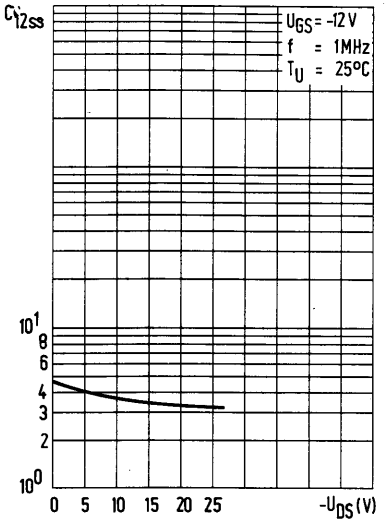
Drainstrom
$I_D = f(U_{GS})$



Eingangskapazität
$C_{11ss} = f(U_{GS})$



Rückwirkungskapazität
$C_{12ss} = f(U_{DS})$



Kleinsignal-Drain-Source-
Durchlaßwiderstand
$r_{ds} = f(U_{GS})$