NEC

DATA SHEET

MOS FIELD EFFECT TRANSISTOR

μPA505T

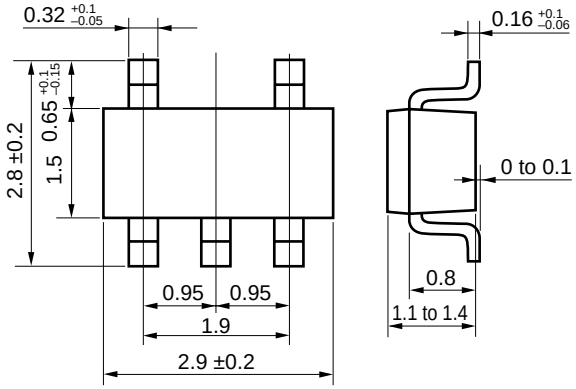
N-CHANNEL/P-CHANNEL MOS FET (5-PIN 2 CIRCUITS)

The μPA505T is a mini-mold device provided with two MOS FET circuits. It achieves high-density mounting and saves mounting costs.

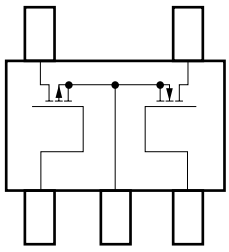
FEATURES

- Two source common MOS FET circuits in package the same size as SC-59
- Complementary MOS FETs are provided in one package.
- Automatic mounting supported

PACKAGE DIMENSIONS (in millimeters)



PIN CONNECTION (Top View)



Marking: FA

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain to Source Voltage	V_{DSS}	50/–50	V
Gate to Source Voltage	V_{GSS}	±20/∓16	V
Drain Current (DC)	$I_{D(DC)}$	±100/∓100	mA
Drain Current (pulse)	$I_{D(pulse)}$*	±200/∓200	mA
Total Power Dissipation	P_T	300 (TOTAL)	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

***** PW ≤ 10 ms, Duty Cycle ≤ 50 %

Note The left and right values in the ratings column are correspond to N-ch and P-ch FETs, respectively.

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

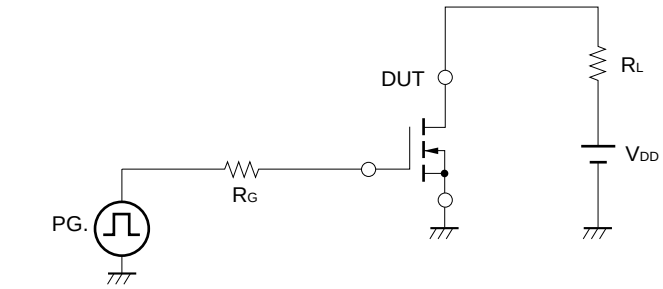
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-off Current	I_{DSS}	V_{DS} = 50/–50 V, V_{GS} = 0	–	–	1.0 / –1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±20/∓16 V, V_{DS} = 0	–	–	±1.0 / ∓10	μA
Gate Cut-off Voltage	$V_{GS(off)}$	V_{DS} = 5.0/–5.0 V, I_D = 1/–1 μA	0.8 / –1.5	1.4 / –1.9	1.8 / –2.5	V
Forward Transfer Admittance	$\|y_{fs}\|$	V_{DS} = 5.0/–5.0 V, I_D = 10/–10 mA	20 / 15	–	–	mS
Drain to Source On-State Resistance	$R_{DS(on)1}$	V_{GS} = 4/–4 V, I_D = 10/–10 mA	–	19 / 60	30 / 100	Ω
Drain to Source On-State Resistance	$R_{DS(on)2}$	V_{GS} = 10/–10 V, I_D = 10/–10 mA	–	15 / 40	25 / 60	Ω
Input Capacitance	C_{iss}	V_{DS} = 5.0/–5.0 V V_{GS} = 0, f = 1.0 MHz	–	16 / 10	–	pF
Output Capacitance	C_{oss}		–	12 / 4	–	pF
Reverse Transfer Capacitance	C_{rss}		–	3 / 4	–	pF
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 5.0/–5.0 V, I_D = 10/–10 mA $V_{GS(on)}$ = 5.0/–5.0 V R_G = 10 Ω, R_L = 500 Ω	–	17 / 40	–	ns
Rise Time	t_r		–	10 / 40	–	ns
Turn-Off Delay Time	$t_{d(off)}$		–	68 / 100	–	ns
Fall Time	t_f		–	38 / 80	–	ns

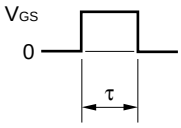
Marking: FA

Note The left and right values in above table represent the N-ch and P-ch characteristics, respectively.

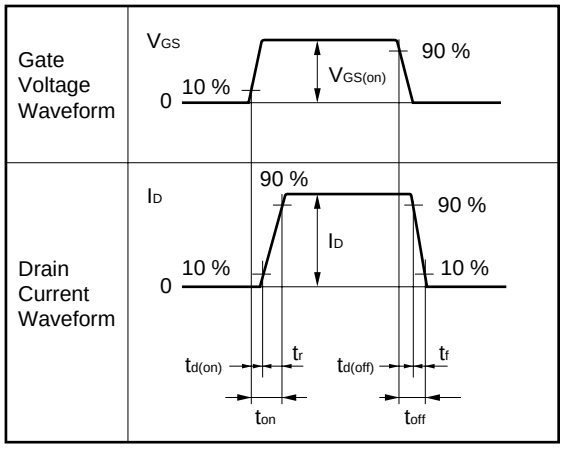
SWITCHING TIME MEASUREMENT CIRCUIT AND MEASUREMENT CONDITIONS (RESISTANCE LOADED)

- N-ch part

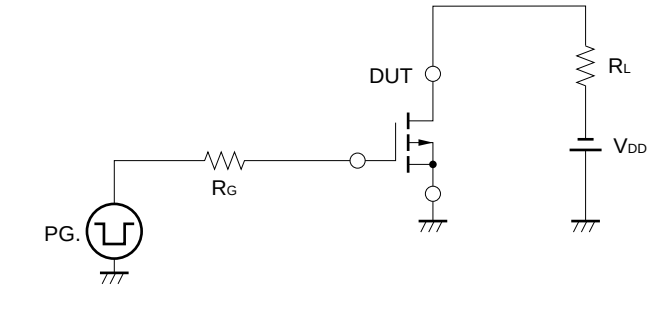


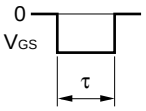


τ = 1 μs
Duty Cycle ≤ 1 %

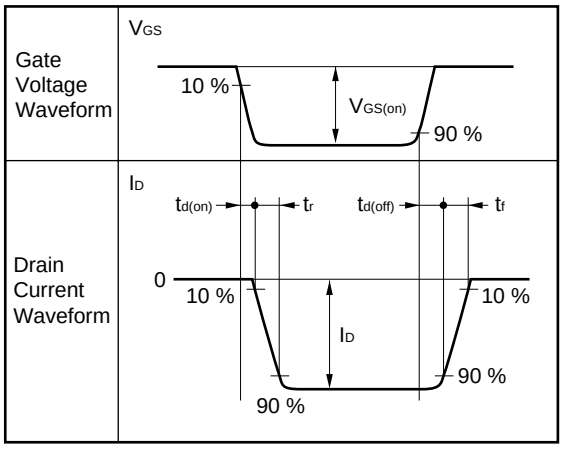


- P-ch part





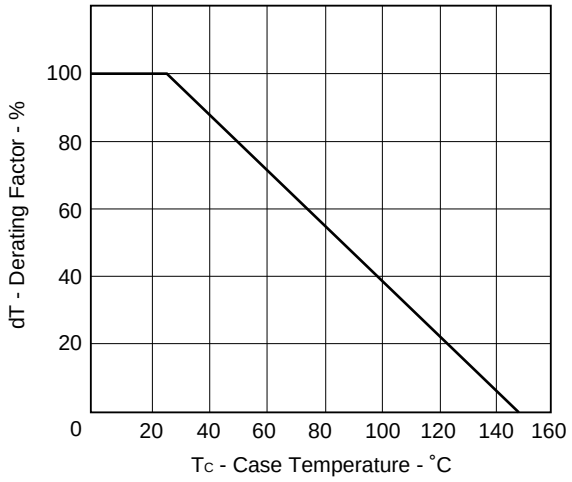
τ = 1 μs
Duty Cycle ≤ 1 %



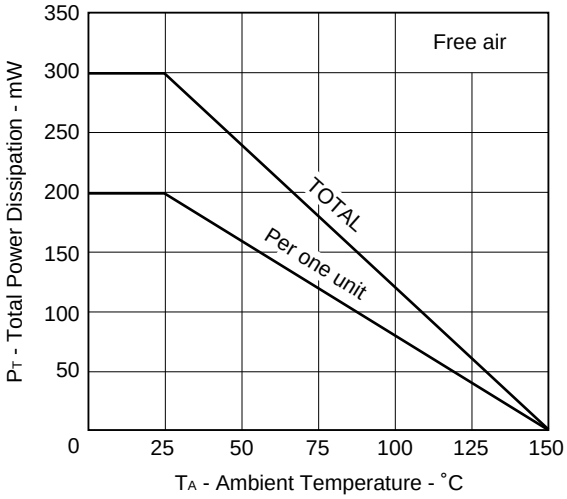
TYPICAL CHARACTERISTICS (T_A = 25 ˚C)

- N-ch part

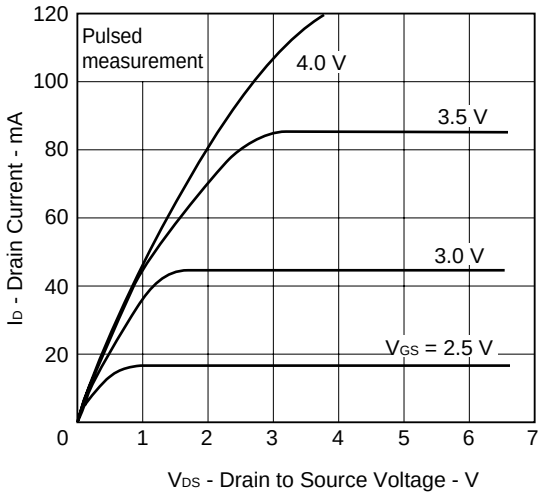
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



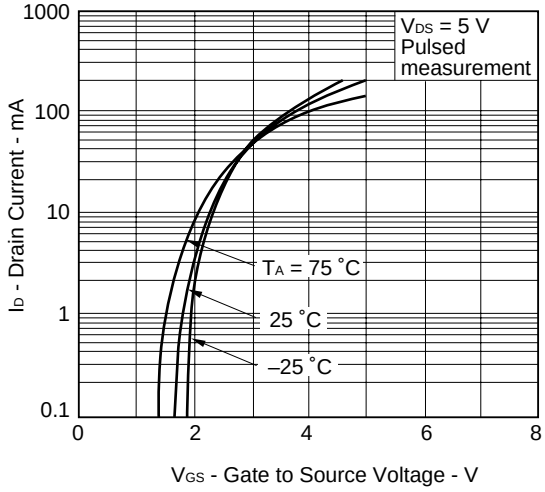
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



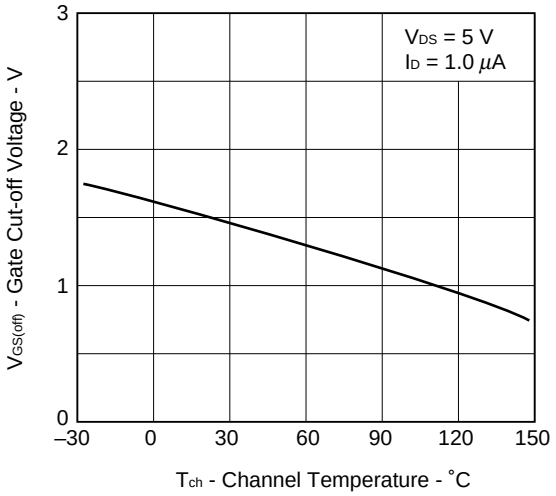
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



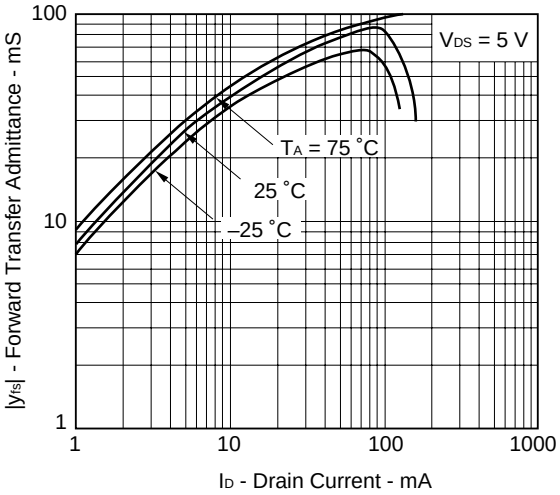
TRANSFER CHARACTERISTICS



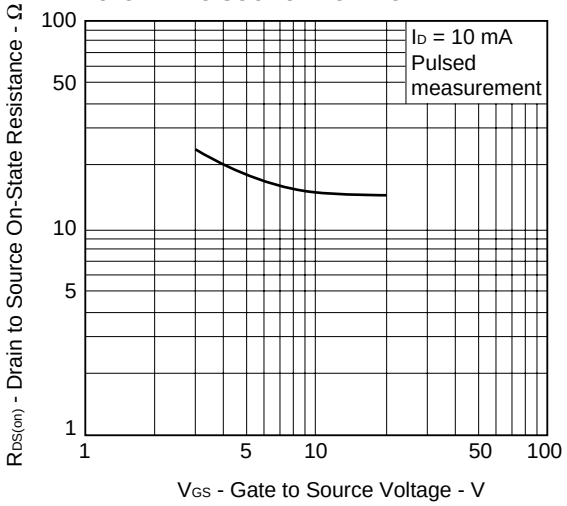
GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



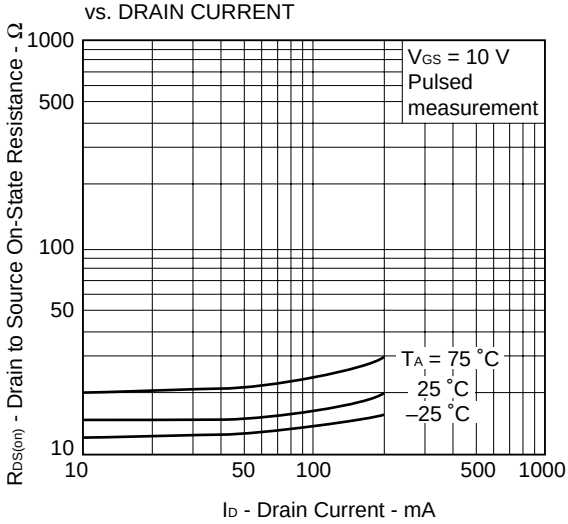
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



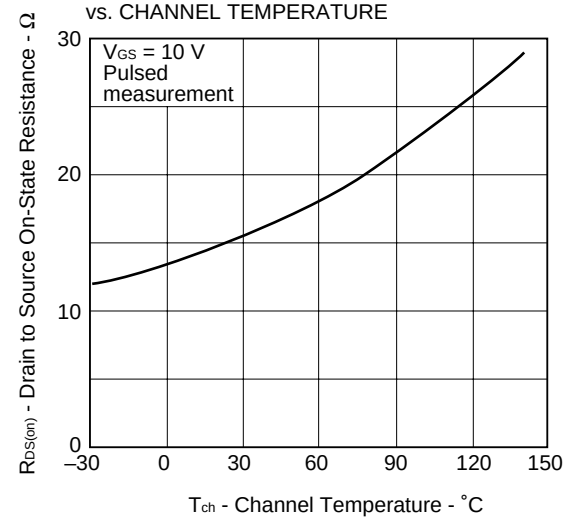
DRAIN TO SOURCE ON-STATE RESISTANCE
vs. GATE TO SOURCE VOLTAGE



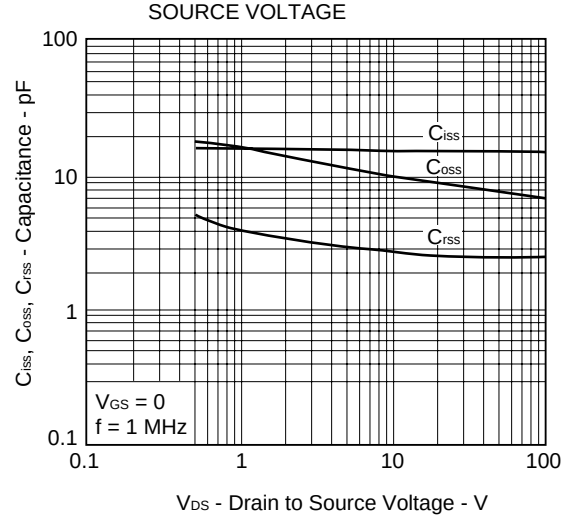
DRAIN TO SOURCE ON-STATE RESISTANCE
vs. DRAIN CURRENT



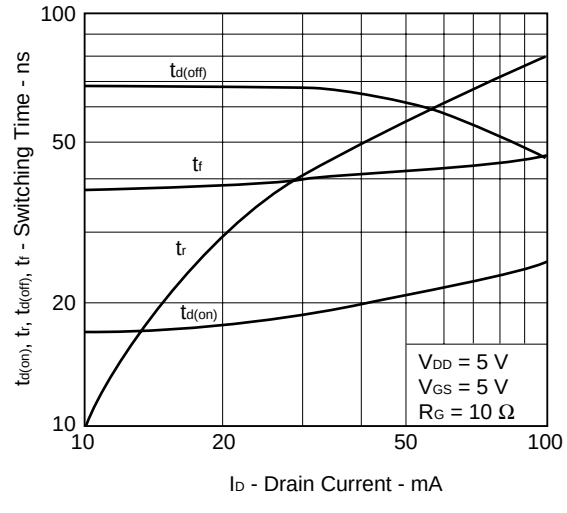
DRAIN TO SOURCE ON-STATE RESISTANCE
vs. CHANNEL TEMPERATURE



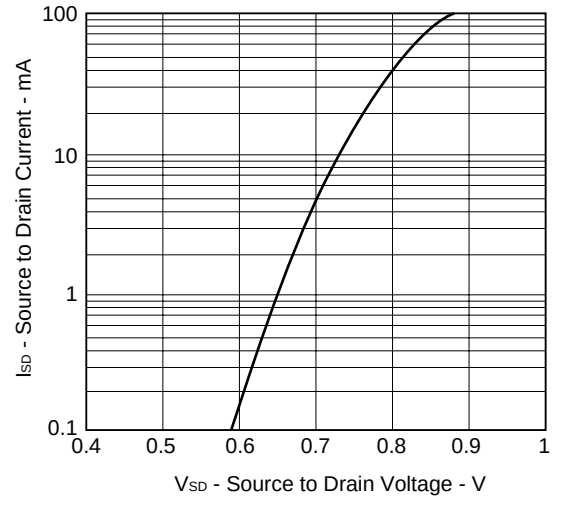
CAPACITANCE vs. DRAIN TO
SOURCE VOLTAGE



SWITCHING CHARACTERISTICS

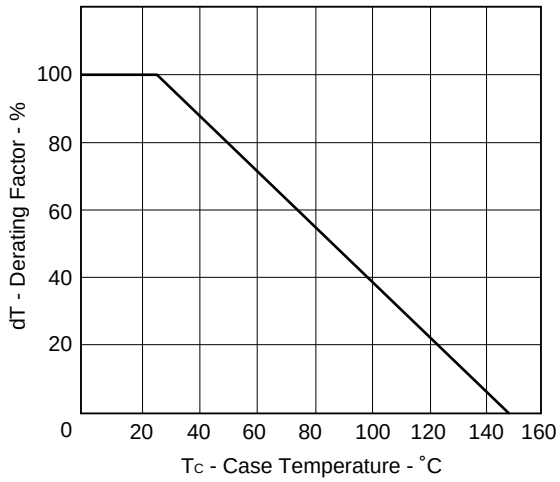


SOURCE TO DRAIN DIODE
FORWARD VOLTAGE

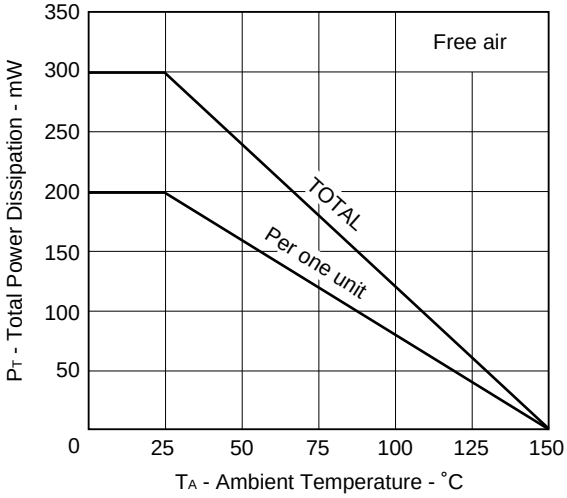


• P-ch part

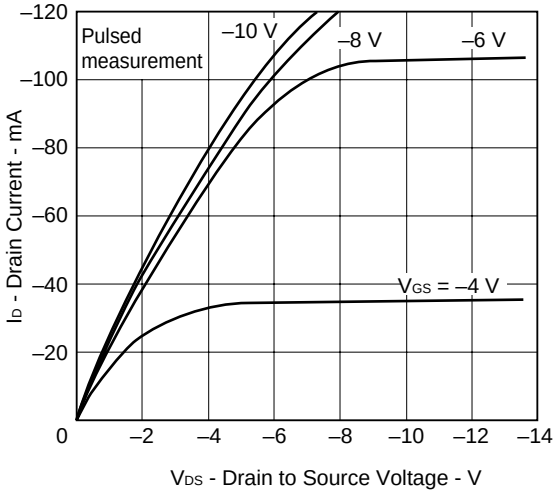
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



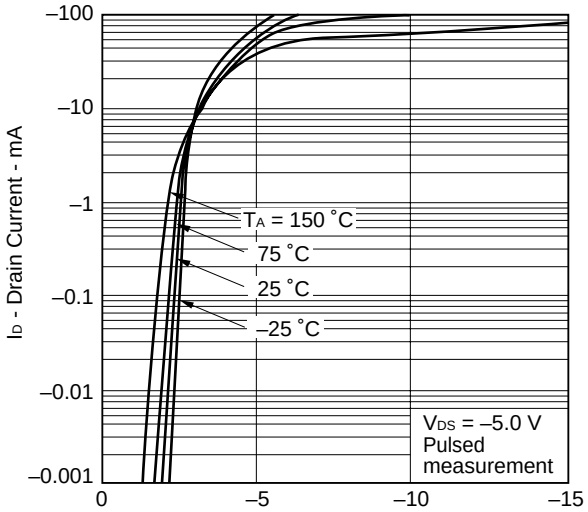
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



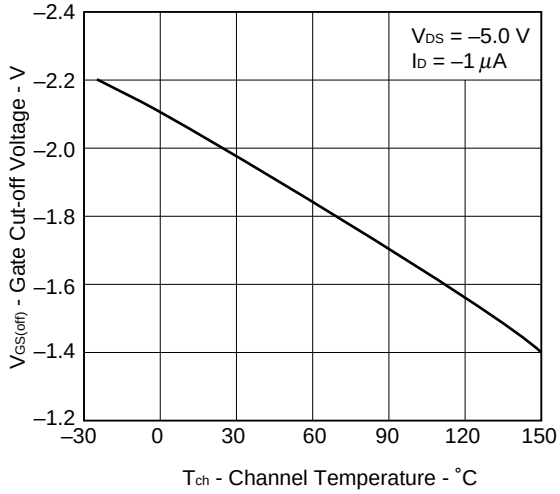
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



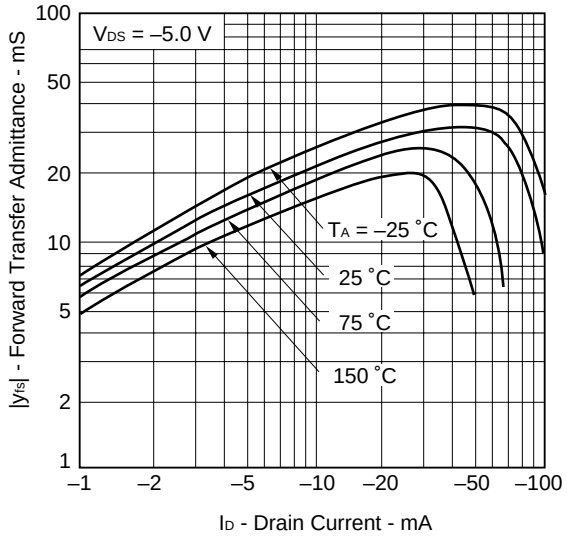
TRANSFER CHARACTERISTICS



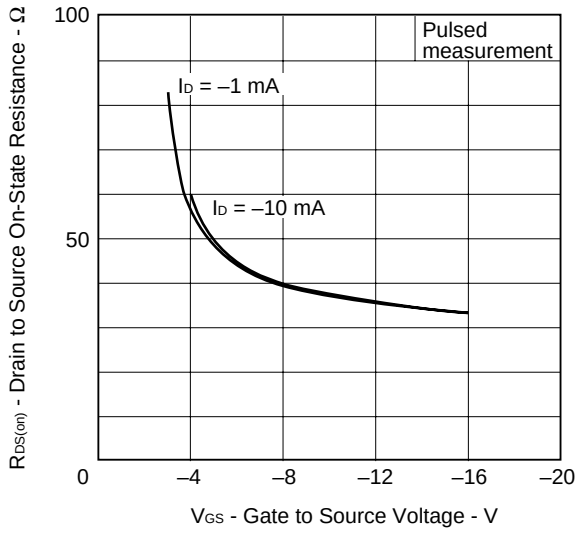
GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



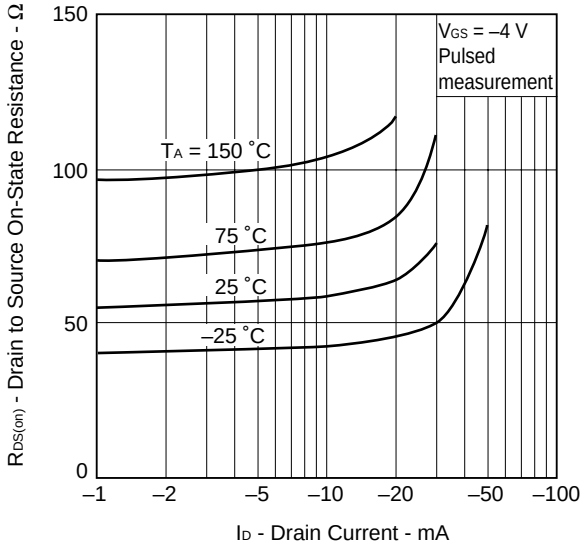
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



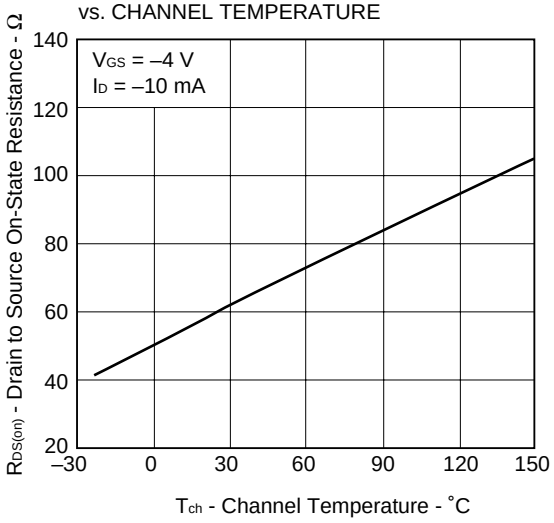
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



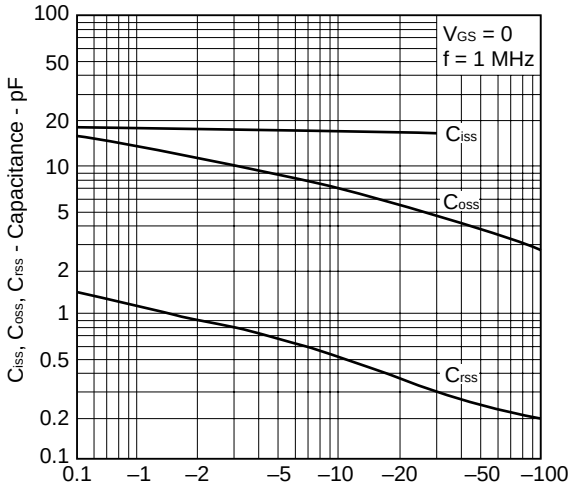
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



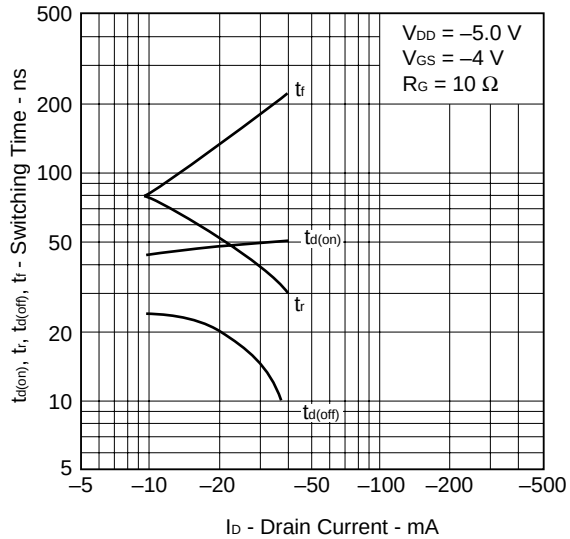
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



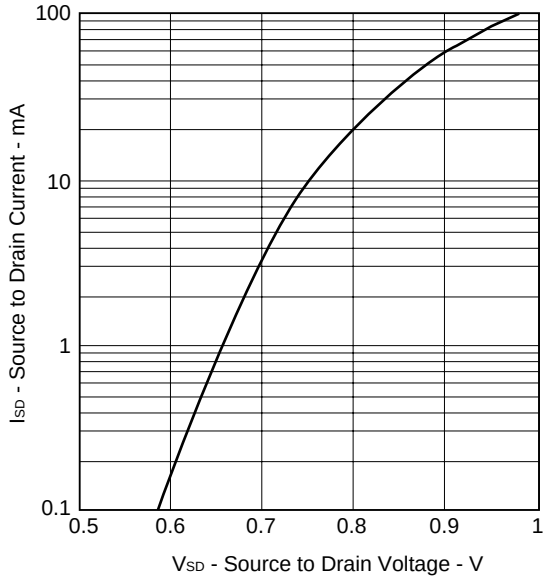
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system	TEI-1202
Quality grade on NEC semiconductor devices	IEI-1209
Semiconductor device mounting technology manual	C10535E
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	X10679E

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