

μPA503CT

R07DS1279EJ0200

Rev.2.00

Jul 08, 2015

P-CHANNEL MOSFET FOR SWITCHING

Description

The μPA503CT, P-channel vertical type MOSFET designed for general-purpose switch, is a device which can be driven directly by a 4.5 V power source.

Features

- Two MOSFET circuits (Two source common)
- Directly driven by a 4.5 V power source.
- Low on-state resistance
 $R_{DS(on)1} = 2.7 \Omega \text{ MAX. (} V_{GS} = -10 \text{ V, } I_D = -100 \text{ mA)}$
 $R_{DS(on)2} = 3.2 \Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -50 \text{ mA)}$

Ordering Information

Part Number	Lead Plating	Packing	Package
μPA503CT-T1-A/AT	-A:Sn-Bi, -AT:Pure Sn	3000p/Reel	SC-74A (5pMM)

Remark "-A/AT" indicates Pb-free. This product does not contain Pb in external electrode and other parts.

Marking UF

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$)

Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	-60	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	±20	V
Drain Current (DC)	$I_{D(DC)}$	±100	mA
Drain Current (pulse) ^{Note}	$I_{D(pulse)}$	±200	mA
Total Power Dissipation	P_T	300 (Total)	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C

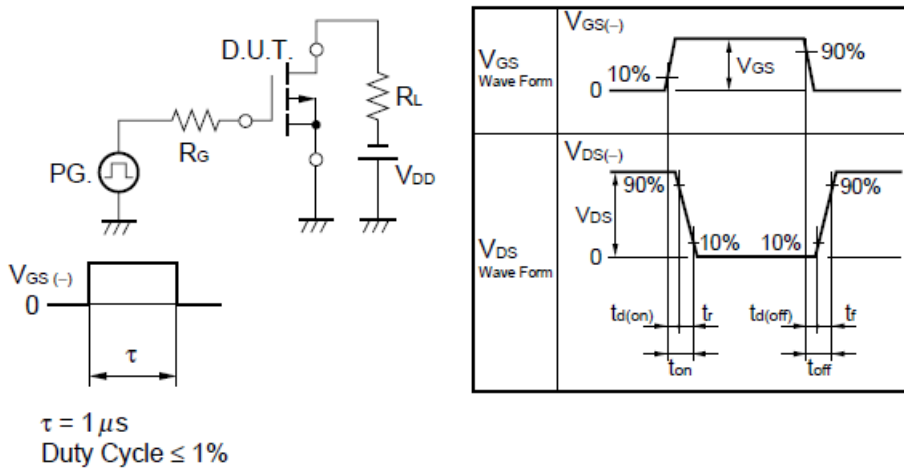
Note $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

Electrical Characteristics (TA = 25°C)

Characteristics	Symbol	Test Conditions	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$			∓ 10	μA
Gate to Source Cut-off Voltage	$V_{GS(off)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1.0		-2.5	V
Forward Transfer Admittance Note	$ y_{fs} $	$V_{DS} = -10\text{ V}, I_D = -100\text{ mA}$	150			mS
Drain to Source On-state Resistance Note	$R_{DS(on)1}$	$V_{GS} = -10\text{ V}, I_D = -100\text{ mA}$		1.8	2.7	Ω
	$R_{DS(on)2}$	$V_{GS} = -4.5\text{ V}, I_D = -50\text{ mA}$		2.0	3.2	Ω
Input Capacitance	C_{iss}	$V_{DS} = -10\text{ V},$		9		pF
Output Capacitance	C_{oss}	$V_{GS} = 0\text{ V},$		7		pF
Reverse Transfer Capacitance	C_{rss}	$f = 1.0\text{ MHz}$		2		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -10\text{ V},$		75		ns
Rise Time	t_r	$I_D = -200\text{ mA},$		110		ns
Turn-off Delay Time	$t_{d(off)}$	$V_{GS} = -10\text{ V},$		900		ns
Fall Time	t_f	$R_G = 10\ \Omega$		400		ns
Total Gate Charge	Q_G	$I_D = -200\text{ mA}, V_{DD} = -25\text{ V}, V_{GS} = -10\text{ V}$		2.2		nC
Body Diode Forward Voltage Note	$V_{F(S-D)}$	$I_F = -200\text{ mA}, V_{GS} = 0\text{ V}$		0.86		V

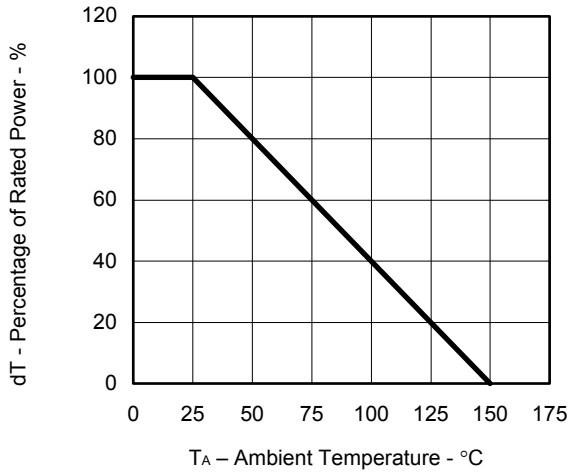
Note Pulsed

Test Circuit Switching Time

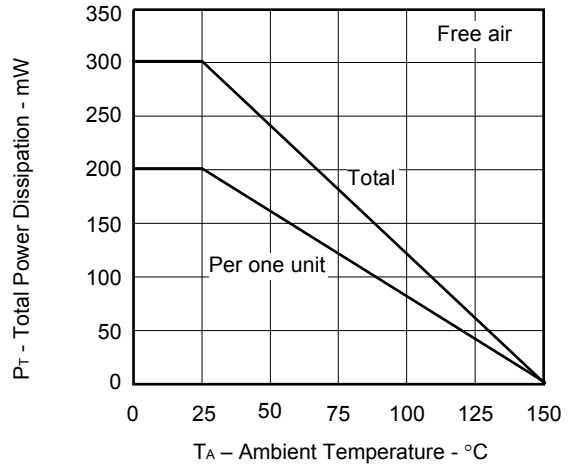


Typical Characteristics (T_A = 25°C)

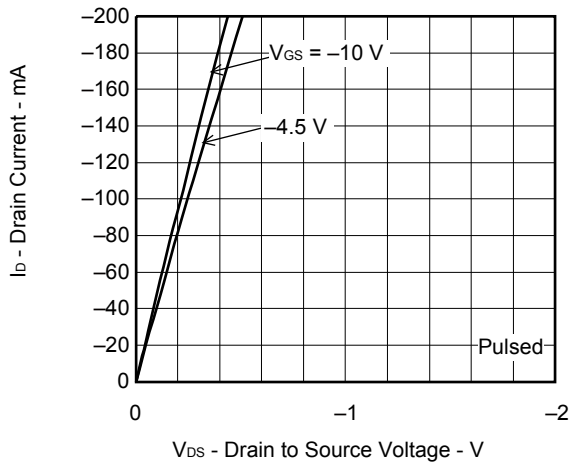
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



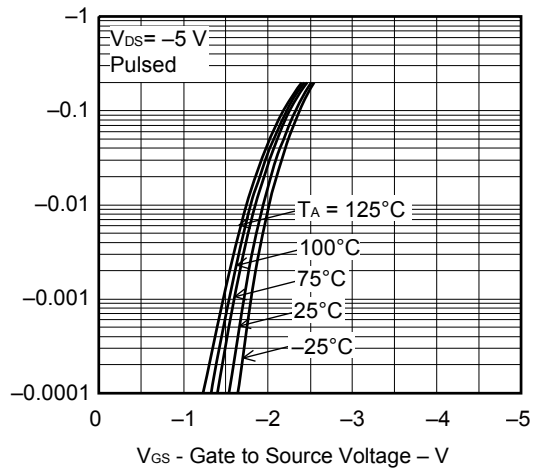
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



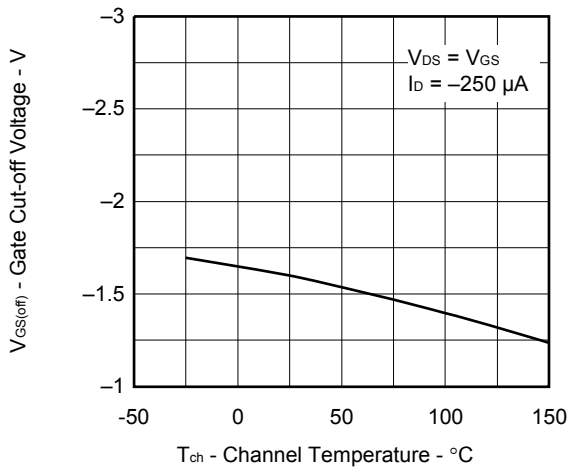
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



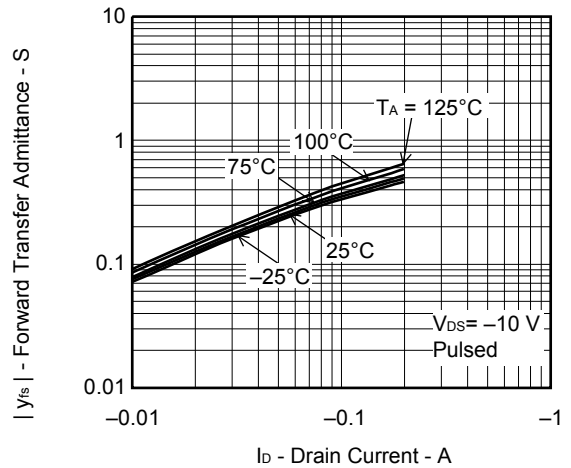
FORWARD TRANSFER CHARACTERISTICS



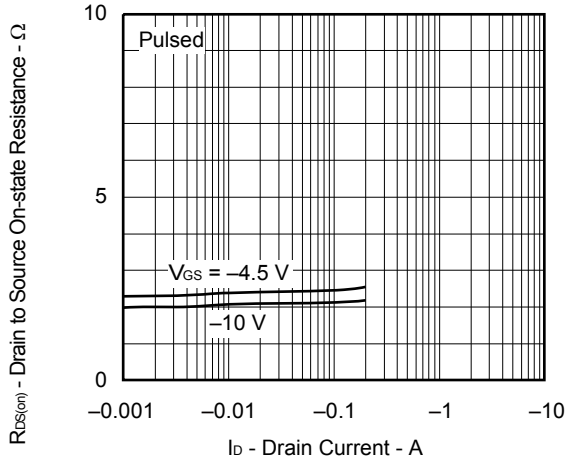
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



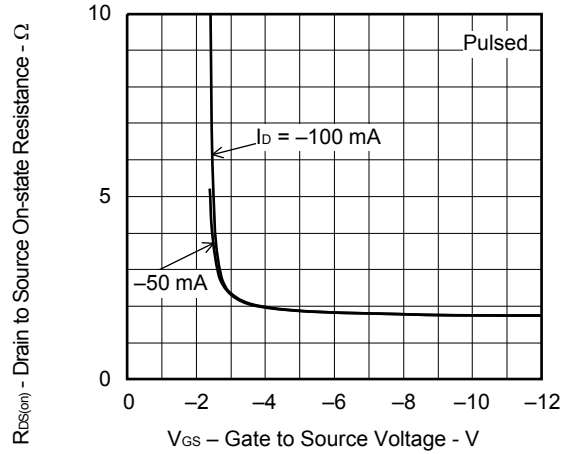
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



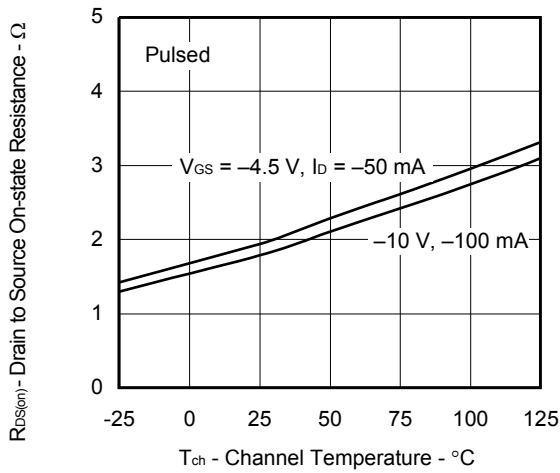
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



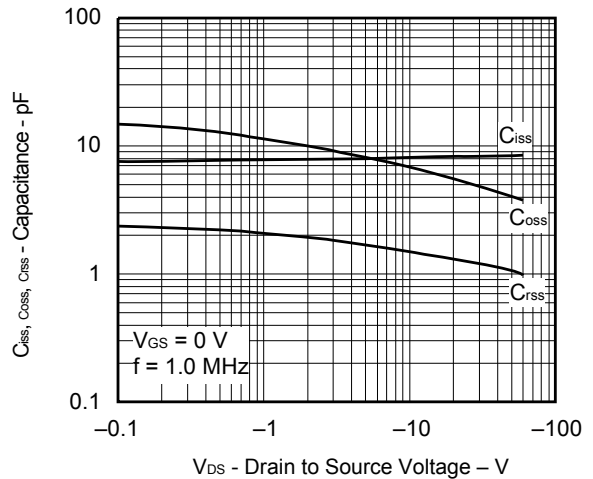
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



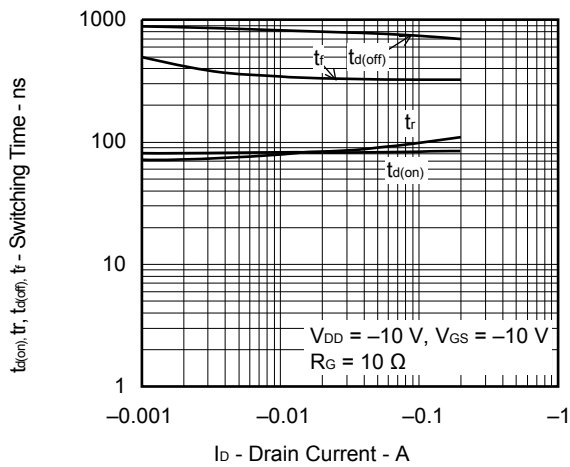
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



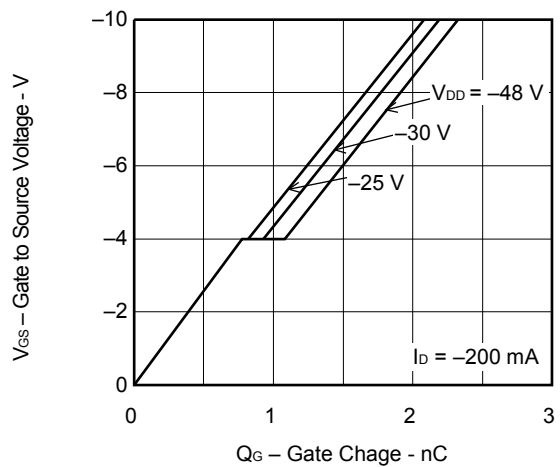
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



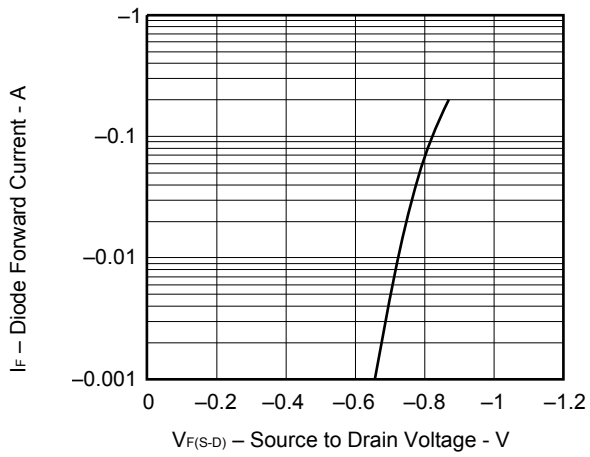
SWITCHING CHARACTERISTICS



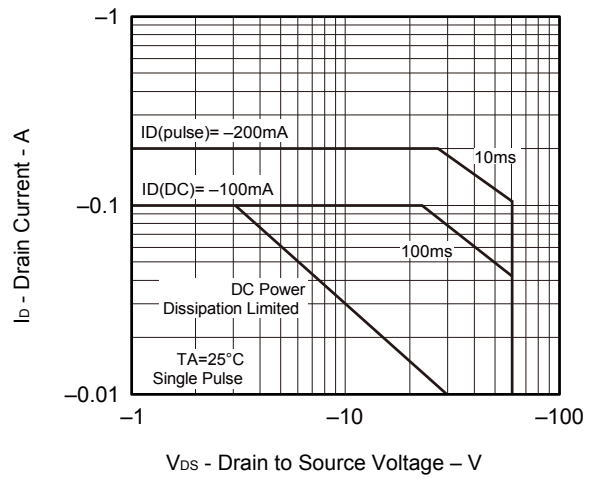
DYNAMIC INPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE

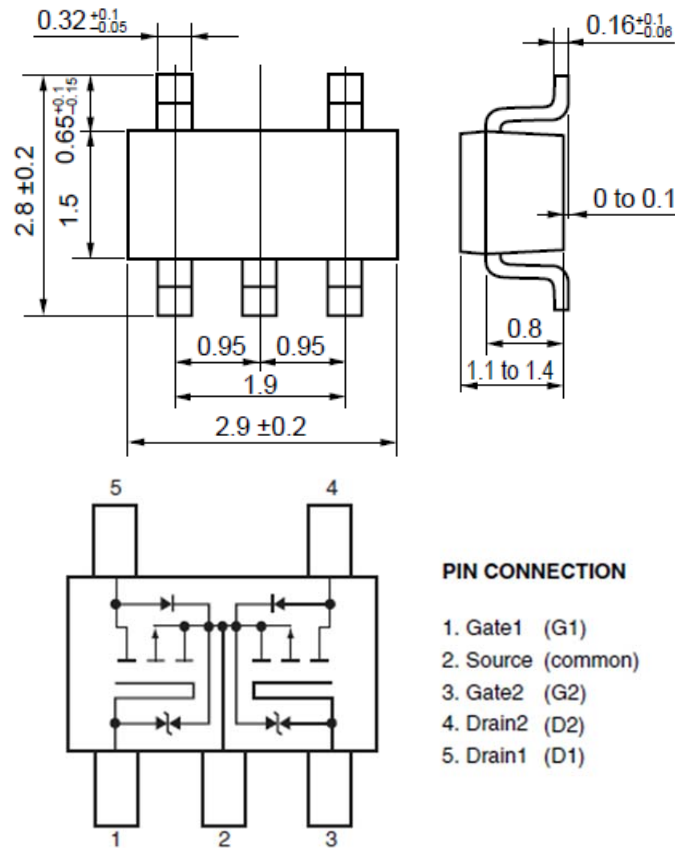


FORWARD BIAS SAFE OPERATING AREA

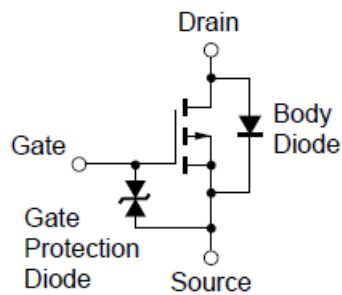


Package Drawings (Unit: mm)

SC-74A (5pMM)



Equivalent Circuit



Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

	μPA503CT
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Rev.	Date	Description	
		Page	Summary
1.00	Sep , 2013	-	First Edition Issued
2.00	Jun, 2015	3, 4, 5	Changed all graphs
		3	Added FORWARD BIAS SAFE OPERATING AREA

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