

μPA502CT

R07DS1277EJ0200

Rev.2.00

Jul 06, 2015

N-CHANNEL MOSFET FOR SWITCHING

Description

The μPA502CT, N-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
μPA502CT-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 UE

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

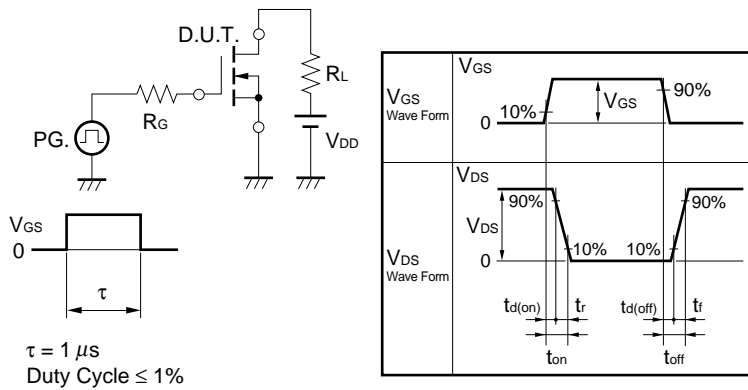
Note $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

Electrical Characteristics (T_A = 25°C)

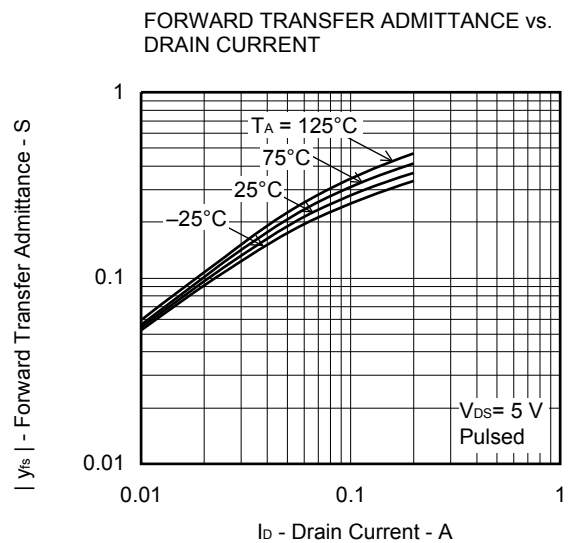
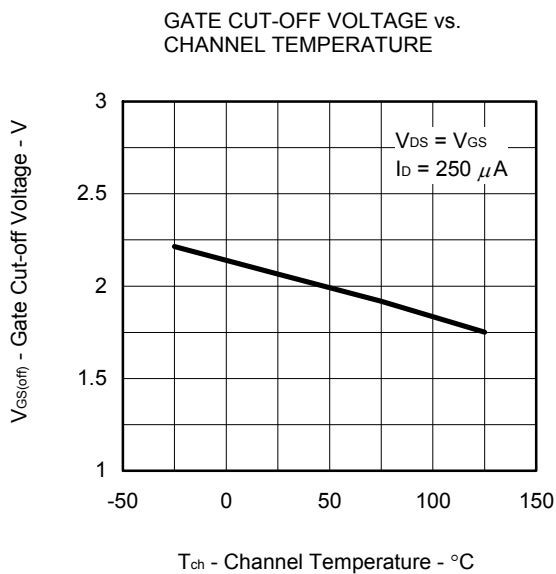
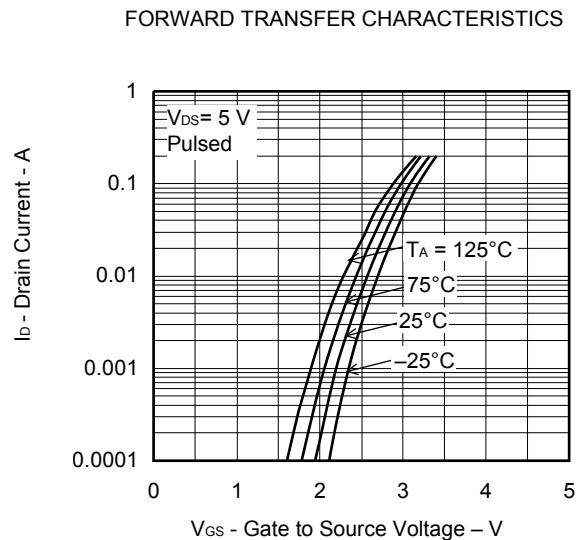
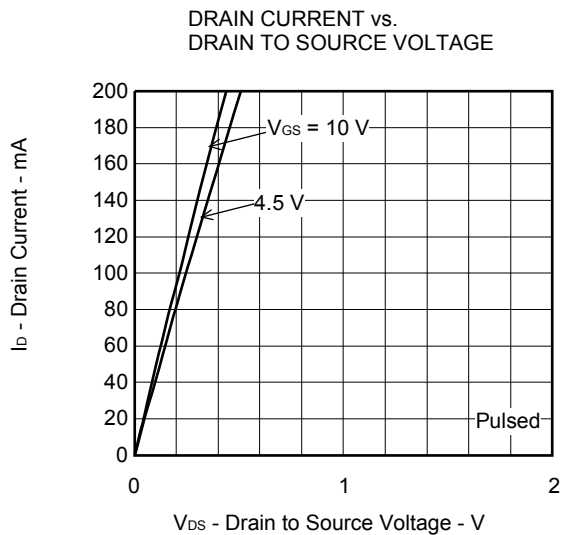
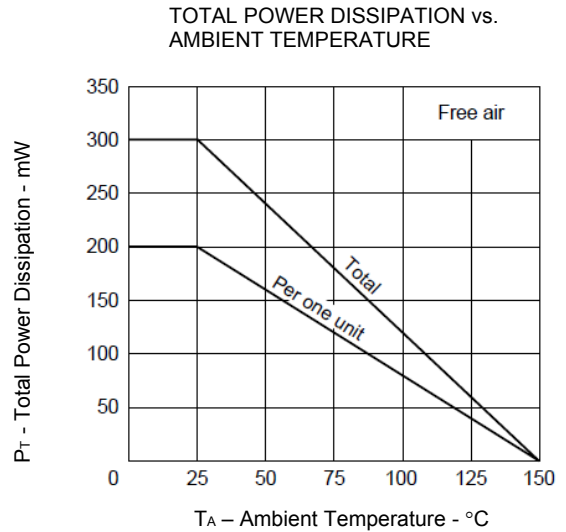
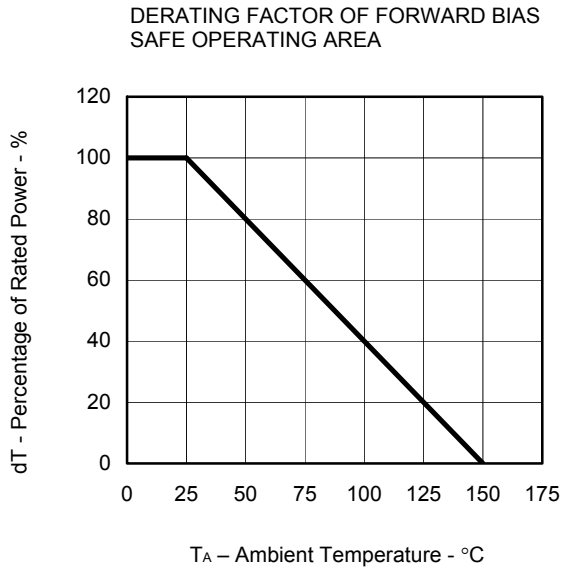
Characteristics	Symbol	Test Conditions	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V			1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±10	μA
Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0		2.5	V
Forward Transfer Admittance Note	y _{fs}	V _{DS} = 10 V, I _D = 100 mA	150			mS
Drain to Source On-state Resistance Note	R _{DS(on)1}	V _{GS} = 10 V, I _D = 100 mA		2.1	2.7	Ω
	R _{DS(on)2}	V _{GS} = 4.5 V, I _D = 50 mA		2.4	3.2	Ω
Input Capacitance	C _{iss}	V _{DS} = 10 V,		20		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V,		9		pF
Reverse Transfer Capacitance	C _{rss}	f = 1.0 MHz		2		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 10 V,		16		ns
Rise Time	t _r	I _D = 200 mA,		6.5		ns
Turn-off Delay Time	t _{d(off)}	V _{GS} = 10 V,		82		ns
Fall Time	t _f	R _G = 10 Ω		32		ns
Total Gate Charge	Q _G	I _D = 200 mA, V _{DD} = 25 V, V _{GS} = 10 V		2		nC
Body Diode Forward Voltage Note	V _{F(S-D)}	I _F = 200 mA, V _{GS} = 0 V		0.86		V

Note Pulsed

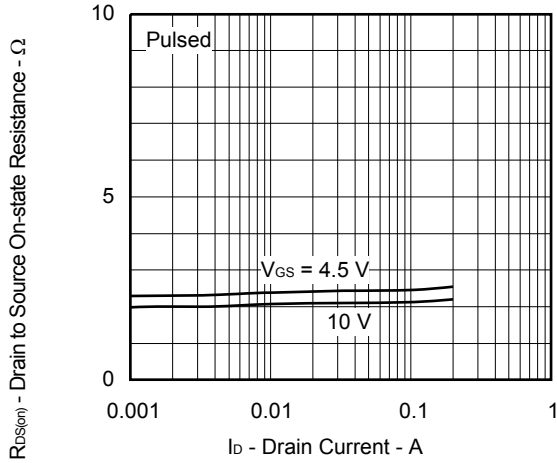
Test Circuit Switching Time



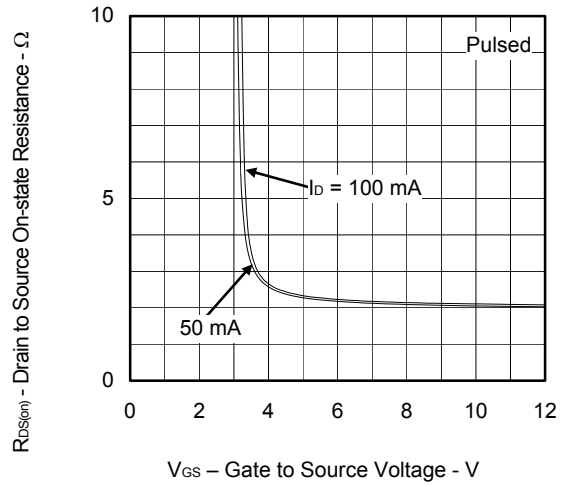
Typical Characteristics (T_A = 25°C)



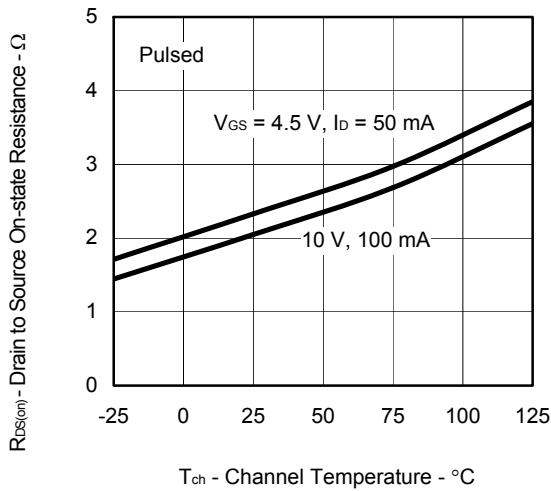
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



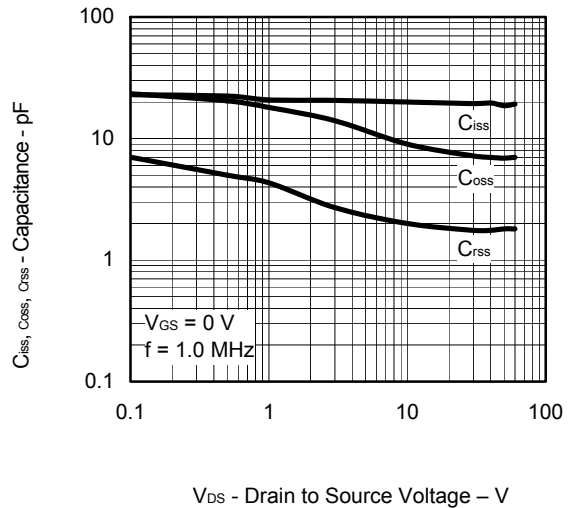
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



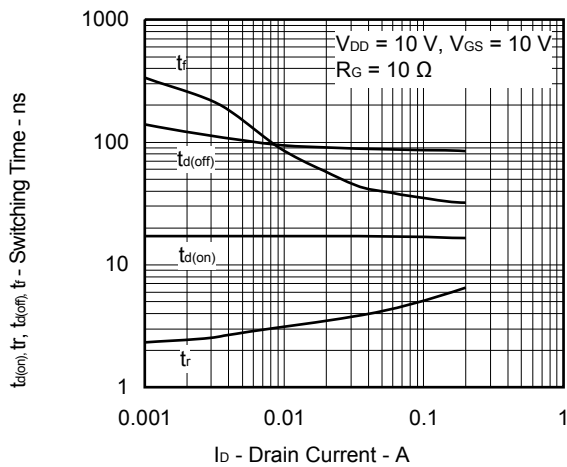
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



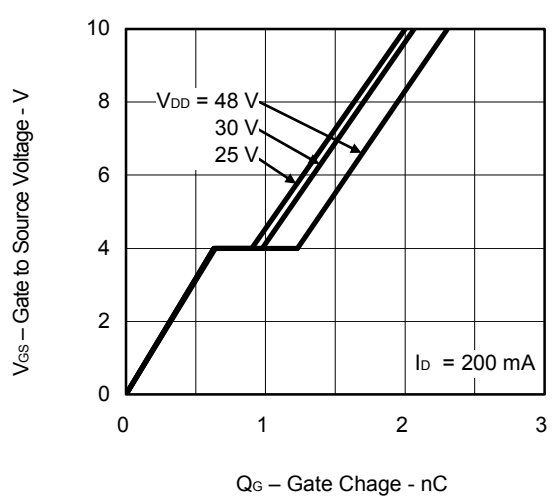
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



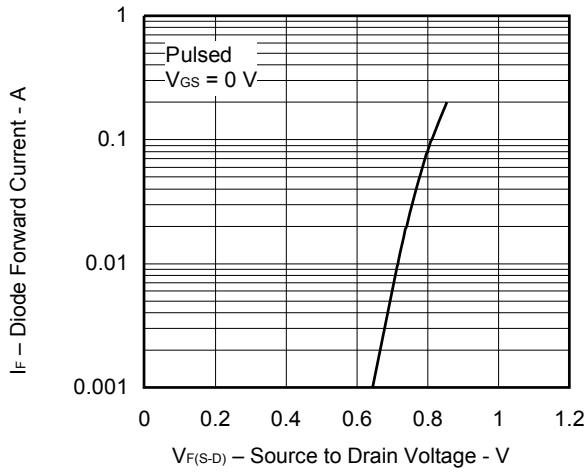
SWITCHING CHARACTERISTICS



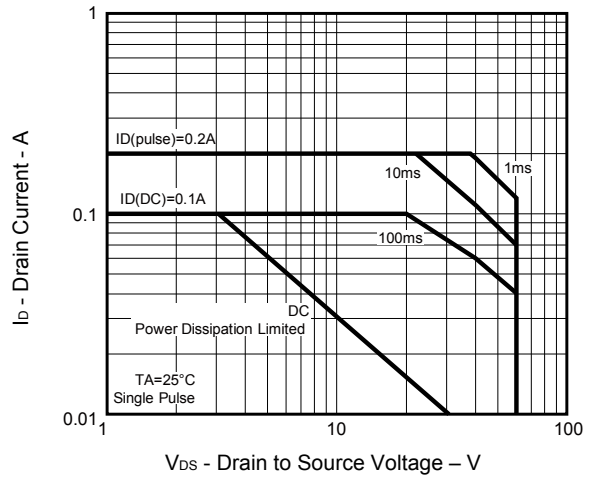
DYNAMIC INPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE

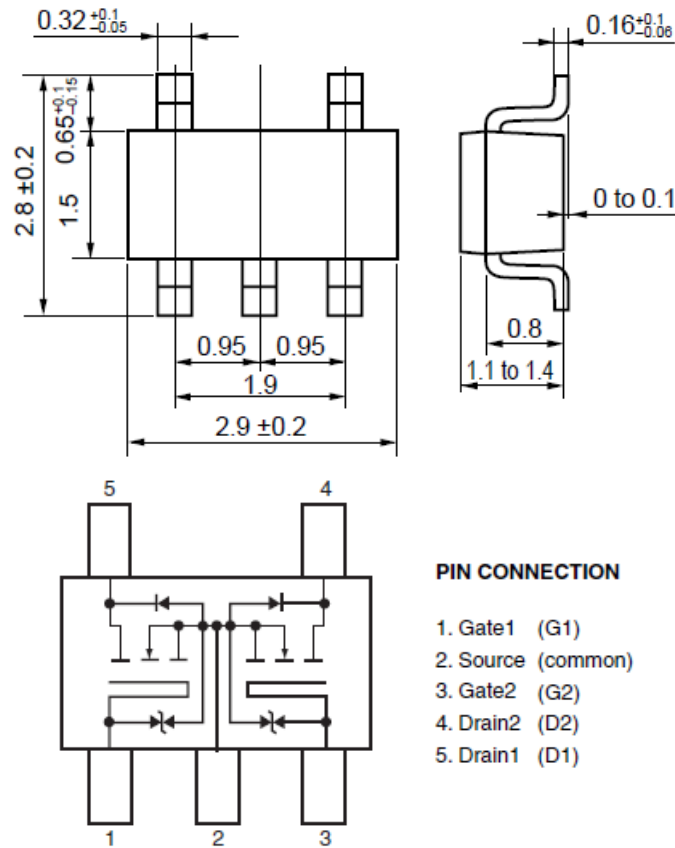


FORWARD BIAS SAFE OPERATING AREA

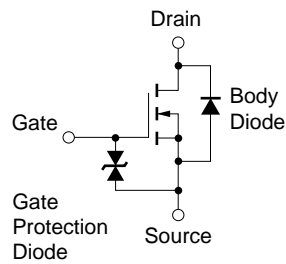


Package Drawings (Unit: mm)

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.

	μPA502CT
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Rev.	Date	Description	
		Page	Summary
1.00	Sep , 2013	-	First Edition Issued
2.00	Jun, 2015	3	- Changed DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE - Changed FORWARD TRANSFER CHARACTERISTICS - Changed FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT
		4	- Changed DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT - Changed SWITCHING CHARACTERISTICS
		5	Added FORWARD BIAS SAFE OPERATING AREA

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