

P-CHANNEL MOS FIELD EFFECT TRANSISTOR
FOR SWITCHING

DESCRIPTION

The μ PA653TT is a switching device, which can be driven directly by a 4.0 V power source.

This device features a low on-state resistance and excellent switching characteristics, and is suitable for applications such as power switch of portable machine and so on.

FEATURES

- 4.0 V drive available
- Low on-state resistance
 $R_{DS(on)1} = 165 \text{ m}\Omega \text{ MAX.}$ ($V_{GS} = -10 \text{ V}$, $I_D = -1.5 \text{ A}$)
 $R_{DS(on)2} = 267 \text{ m}\Omega \text{ MAX.}$ ($V_{GS} = -4.5 \text{ V}$, $I_D = -1.5 \text{ A}$)
 $R_{DS(on)3} = 304 \text{ m}\Omega \text{ MAX.}$ ($V_{GS} = -4.0 \text{ V}$, $I_D = -1.5 \text{ A}$)

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA653TT	6pinWSOF (1620)

Marking: WG

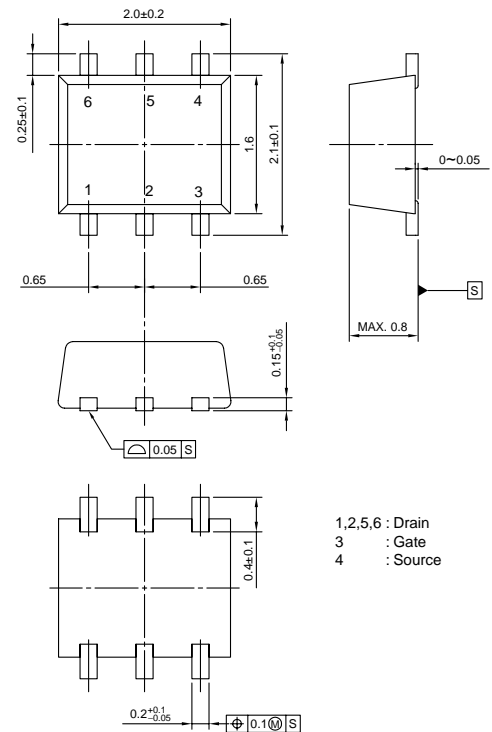
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	-30	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	∓ 20	V
Drain Current (DC) ($T_A = 25^\circ\text{C}$)	$I_{D(DC)}$	∓ 2.5	A
Drain Current (pulse) ^{Note1}	$I_{D(pulse)}$	∓ 10	A
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_{T1}	0.2	W
Total Power Dissipation ($T_C = 25^\circ\text{C}$) ^{Note2}	P_{T2}	1.3	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

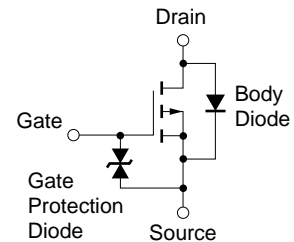
- Notes 1. $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$
 2. Mounted on FR-4 board, $t \leq 5 \text{ sec.}$

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.

PACKAGE DRAWING (Unit: mm)



EQUIVALENT CIRCUIT

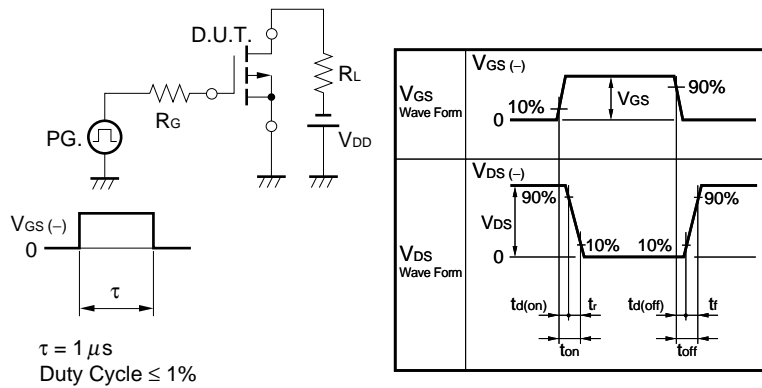


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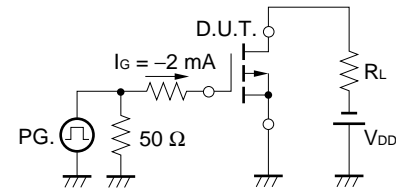
ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0 V			-10	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = -10 V, I _D = -1.0 mA	-1.5		-2.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = -10 V, I _D = -1.5 A	1.0			S
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = -10 V, I _D = -1.5 A		130	165	mΩ
	R _{DS(on)2}	V _{GS} = -4.5 V, I _D = -1.5 A		200	267	mΩ
	R _{DS(on)3}	V _{GS} = -4.0 V, I _D = -1.5 A		228	304	mΩ
Input Capacitance	C _{iss}	V _{DS} = -10 V		175		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		56		pF
Reverse Transfer Capacitance	C _{rss}	f = 1.0 MHz		25		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = -15 V, I _D = -1.5 A		12		ns
Rise Time	t _r	V _{GS} = -10 V		40		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		128		ns
Fall Time	t _f			82		ns
Total Gate Charge	Q _G	V _{DD} = -24 V		3.5		nC
Gate to Source Charge	Q _{GS}	V _{GS} = -10 V		0.7		nC
Gate to Drain Charge	Q _{GD}	I _D = -2.5 A		1.0		nC
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 2.5 A, V _{GS} = 0 V		0.90		V

TEST CIRCUIT 1 SWITCHING TIME



TEST CIRCUIT 2 GATE CHARGE



[MEMO]

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