

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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N-CHANNEL/P-CHANNEL MOS FET PAIR
FOR LOAD SWITCH

DESCRIPTION

The μ PA1981 is a N-Channel/P-Channel MOS FET pair for compact power management in portable electronic equipment where 2.5 to 8 V input and 2.8 A output current capability are needed.

This load switch integrated a small N-Channel MOS FET (Q1), which drives a large P-Channel MOS FET (Q2) in one tiny package (SC-95).

FEATURES

- $V_{S2D21} = 0.2$ V MAX. ($V_{S2S1} = 5.0$ V, $I_{D2} = -2.8$ A, $R_{D2S2(on)1} = 70$ m Ω)
- $V_{S2D22} = 0.2$ V MAX. ($V_{S2S1} = 2.5$ V, $I_{D2} = -1.9$ A, $R_{D2S2(on)2} = 105$ m Ω)

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA1981TE	SC-95 (Mini Mold Thin Type)

Marking: TZ

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Source2 to Source1 Input Voltage Range	V_{S2S1}	2.5 to 8.0	V
Gate1 to Source1 On Voltage Range	V_{G1S1}	1.5 to 7.0	V
Drain2 Current (DC) ^{Note1}	$I_{D2(DC)}$	-2.8	A
Drain2 Current (pulse) ^{Note2}	$I_{D2(pulse)}$	-10.0	A
Total Power Dissipation ^{Note1}	P_T	1.0	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C

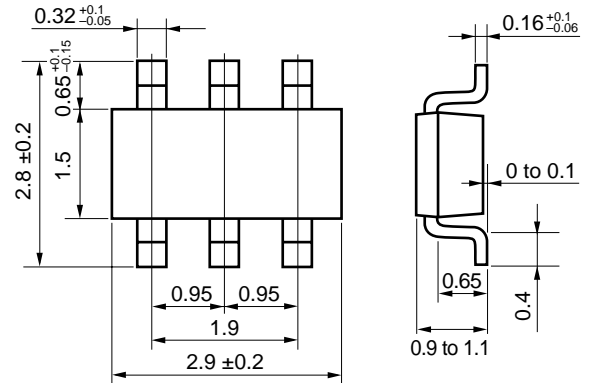
Notes 1. Mounted on FR-4 Board of 2500 mm² x 1.6 mm, t ≤ 5 sec

2. PW ≤ 10 μ s, Duty Cycle ≤ 1%

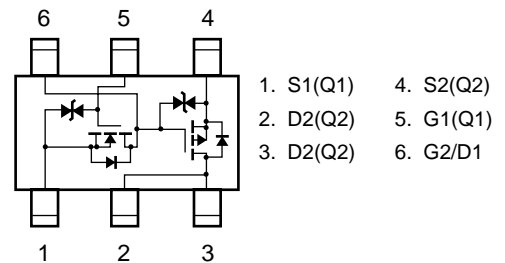
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD.

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)



PIN CONNECTION (Top View)



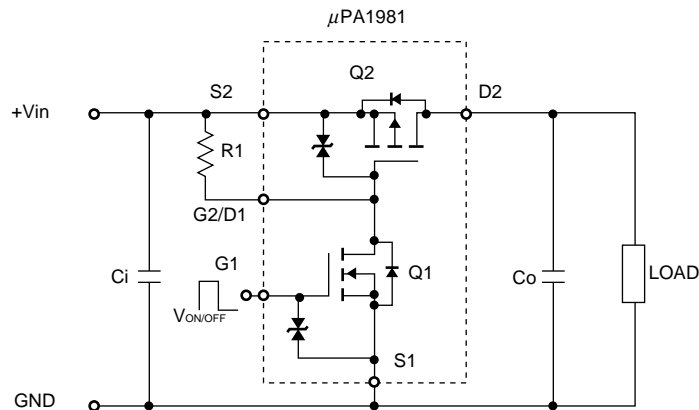
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
OFF CHARACTERISTICS						
Q2-S2 to D2 Leakage Current	I _{S2D2}	V _{S2D2} = 8.0 V, V _{G1S1} = 0 V			1.0	μA
Q1-D1 to S1 Leakage Current	I _{D1S1}	V _{D1S1} = 8.0 V, V _{G1S1} = 0 V			1.0	μA
ON CHARACTERISTICS						
Q2-S2 to D2 Voltage ^{Note}	V _{S2D21}	V _{S2S1} = 5.0 V, V _{G1S1} = 3.3 V, I _{D2} = -2.8 A		0.15	0.2	V
	V _{S2D22}	V _{S2S1} = 2.5 V, V _{G1S1} = 3.3 V, I _{D2} = -1.9 A		0.15	0.2	V
Q2-Static On-Resistance ^{Note}	R _{D2S2(on)1}	V _{G2S2} = -5.0 V, I _{D2} = -2.8 A		52	70	mΩ
	R _{D2S2(on)2}	V _{G2S2} = -2.5 V, I _{D2} = -1.9 A		76	105	mΩ
Q2-S2 to D2 Current ^{Note}	I _{S2D21}	V _{S2D2} = 0.2 V, V _{S2S1} = 5.0 V, V _{G1S1} = 3.3 V	2.8			A
	I _{S2D22}	V _{S2D2} = 0.2 V, V _{S2S1} = 2.5 V, V _{G1S1} = 3.3 V	1.9			A

Note Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2%

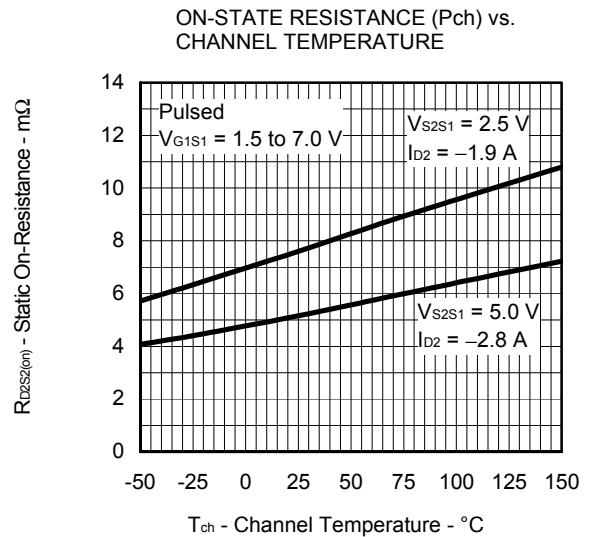
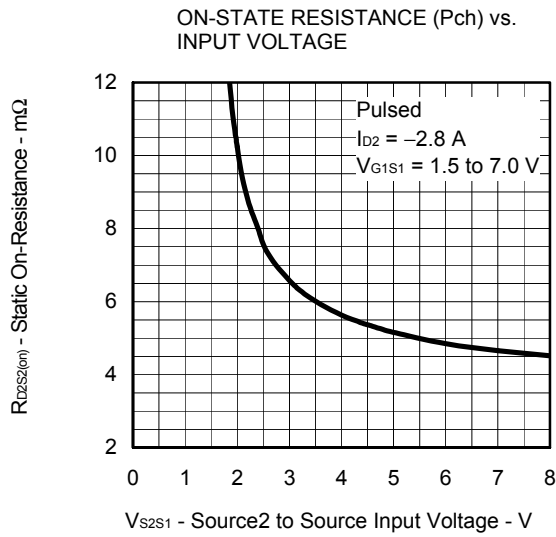
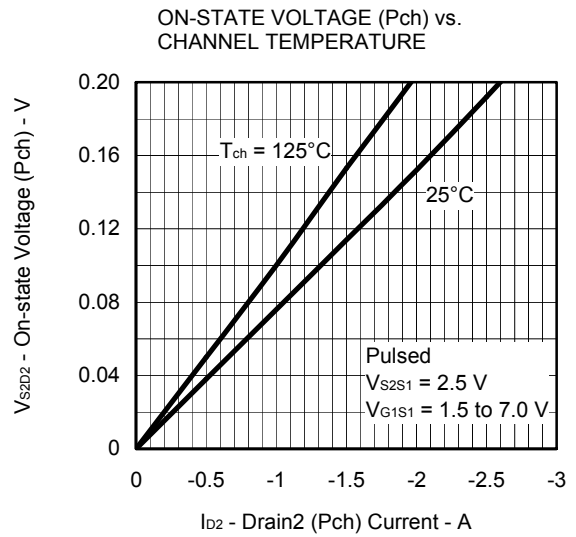
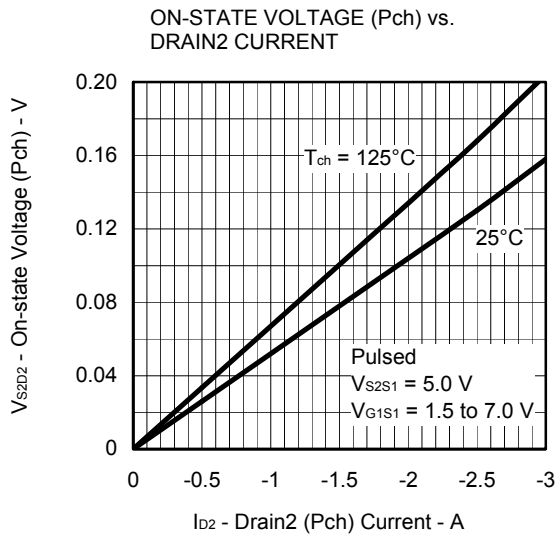
CIRCUIT1 EXAMPLE OF APPLICATION CIRCUIT



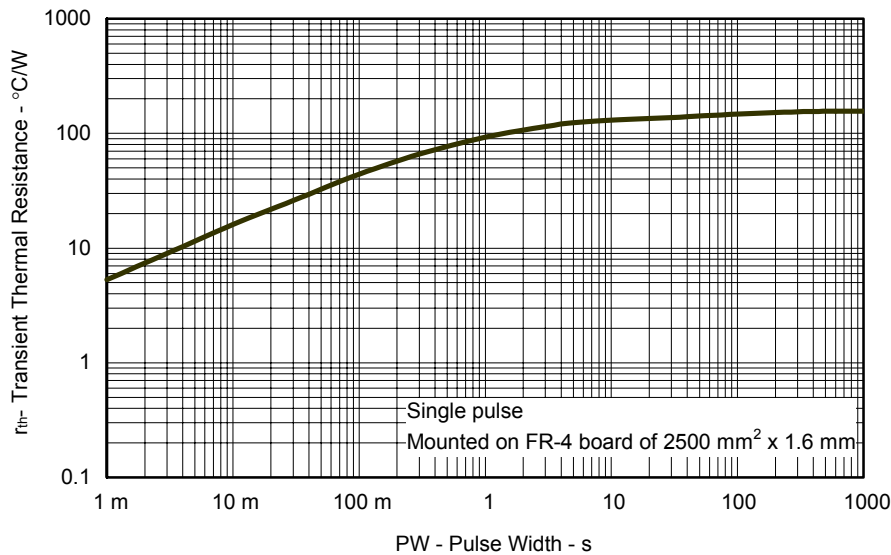
RECOMMENDATION OF CIRCUIT1

- Co ≤ 1 μF for applications
- R1 is required to turn Q2 off.
- Select R1 in the range of 10 to 470 kΩ.

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



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