

μPA2600T1R

N-CHANNEL MOSFET

20 V, 7.0 A, 13.8 mΩ

R07DS0998EJ0101

Rev.1.01

Sep 04, 2013

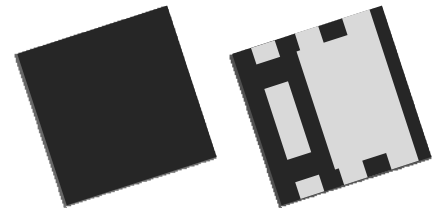
Description

The μPA2600T1R is N-channel MOS Field Effect Transistors for switching application.

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

- High Drain to Source Voltage
— $V_{DS} = 20\text{ V}$ ($V_{GS} = 0\text{ V}$, $T_A = 25^\circ\text{C}$)
- 2.5V drive available
- Low on-state resistance
— $R_{DS(on)1} = 13.8\text{ m}\Omega\text{ MAX.}$ ($V_{GS} = 4.5\text{ V}$, $I_D = 3.5\text{ A}$)
— $R_{DS(on)2} = 19.1\text{ m}\Omega\text{ MAX.}$ ($V_{GS} = 2.5\text{ V}$, $I_D = 3.5\text{ A}$)
- Built-in gate protection diode
- Lead-free and Halogen-free



6pinHUSON2020

Ordering Information

Part Number	Package
μPA2600T1R-E2-AX*1	6pinHUSON2020

Note: *1.Pb-free (This product does not contain Pb in the external electrode and other parts.)

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

Item	Symbol	Ratings	Unit
Drain to Source Voltage ($V_{GS} = 0\text{ V}$)	V_{DSS}	20	V
Gate to Source Voltage ($V_{DS} = 0\text{ V}$)	V_{GSS}	± 12	V
Drain Current (DC) ($T_C = 25^\circ\text{C}$)	$I_{D(DC)}$	± 7.0	A
Drain Current (pulse)*1	$I_{D(pulse)}$	± 28	A
Total Power Dissipation (5 s)*2	P_T	2.4	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 to +150	$^\circ\text{C}$

Notes: *1. $PW \leq 10\text{ }\mu\text{s}$, Duty Cycle $\leq 1\%$

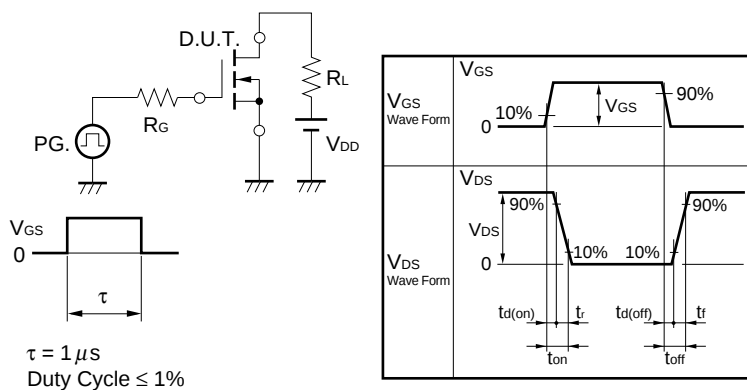
*2. Mounted on glass epoxy board of 25.4mm x 25.4mm x 0.8mm

Electrical Characteristics (T_A = 25°C)

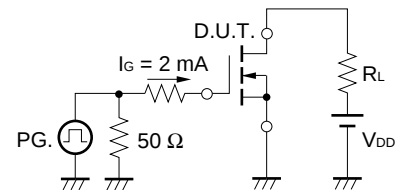
Characteristics	Symbol	MIN.	TYP.	MAX.	Unit	Test Conditions
Zero Gate Voltage Drain Current	I _{DSS}			1.0	μA	V _{DS} = 20 V, V _{GS} = 0 V
Gate Leakage Current	I _{GSS}			±10	μA	V _{GS} = ±10 V, V _{DS} = 0 V
Gate Cut-off Voltage	V _{GS(off)}	0.5		1.5	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance *1	y _{fs}	6.5			S	V _{DS} = 5V, I _D = 3.5 A
Drain to Source On-state Resistance *1	R _{DS(on)1}		11.1	13.8	mΩ	V _{GS} = 4.5 V, I _D = 3.5 A
	R _{DS(on)2}		14.4	19.1	mΩ	V _{GS} = 2.5 V, I _D = 3.5 A
Input Capacitance	C _{iss}		870		pF	V _{DS} = 10 V, V _{GS} = 0 V, f = 1.0 MHz
Output Capacitance	C _{oss}		170		pF	
Reverse Transfer Capacitance	C _{rss}		110		pF	
Turn-on Delay Time	t _{d(on)}		12		ns	I _D = 3.5 A, V _{DD} = 10 V, V _{GS} = 4 V, R _G = 6 Ω
Rise Time	t _r		10		ns	
Turn-off Delay Time	t _{d(off)}		42		ns	
Fall Time	t _f		9		ns	I _D = 7.0 A, V _{DD} = 16 V, V _{GS} = 10 V
Total Gate Charge	Q _G		7.9		nC	
Gate to Source Charge	Q _{GS}		1.7		nC	
Gate to Drain Charge	Q _{GD}		2.8		nC	I _F = 7.0 A, V _{GS} = 0 V
Body Diode Forward Voltage *1	V _{F(S-D)}			1.5	V	

Note: *1. Pulsed

TEST CIRCUIT 1 SWITCHING TIME

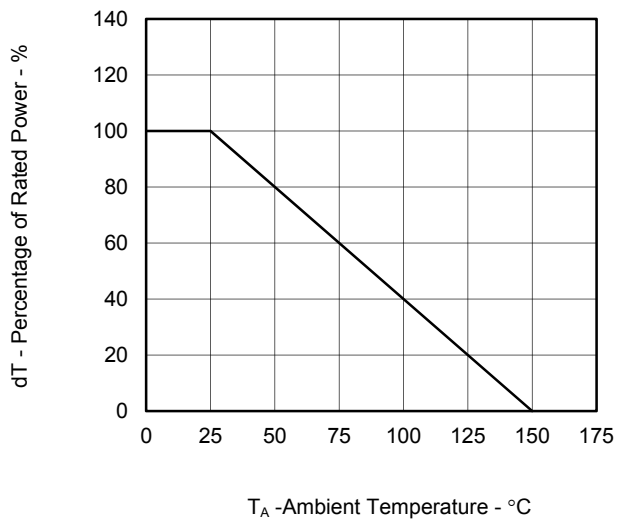


TEST CIRCUIT 2 GATE CHARGE

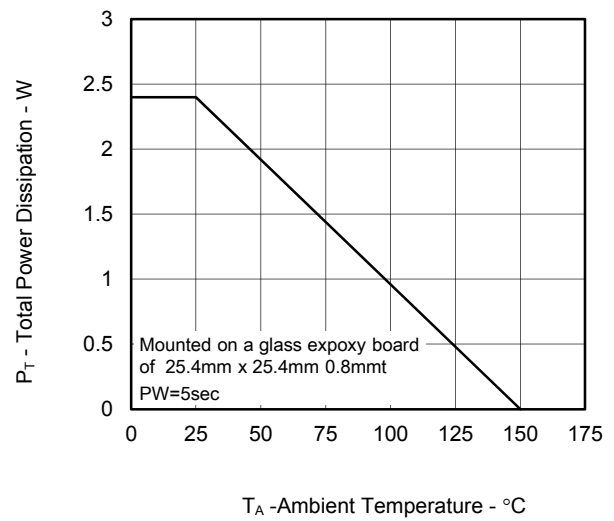


Typical Characteristics (T_A = 25°C)

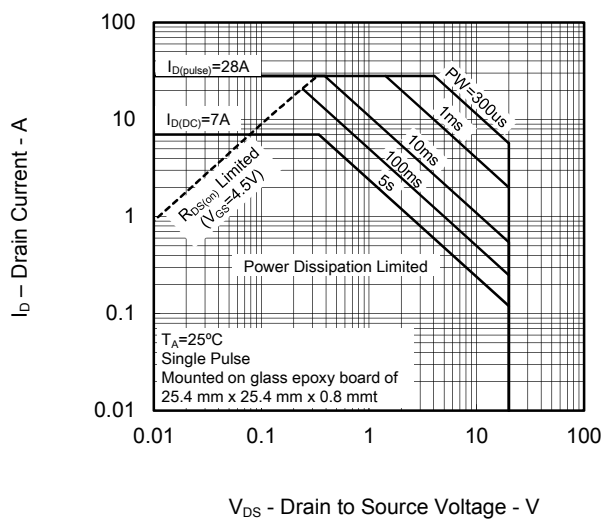
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



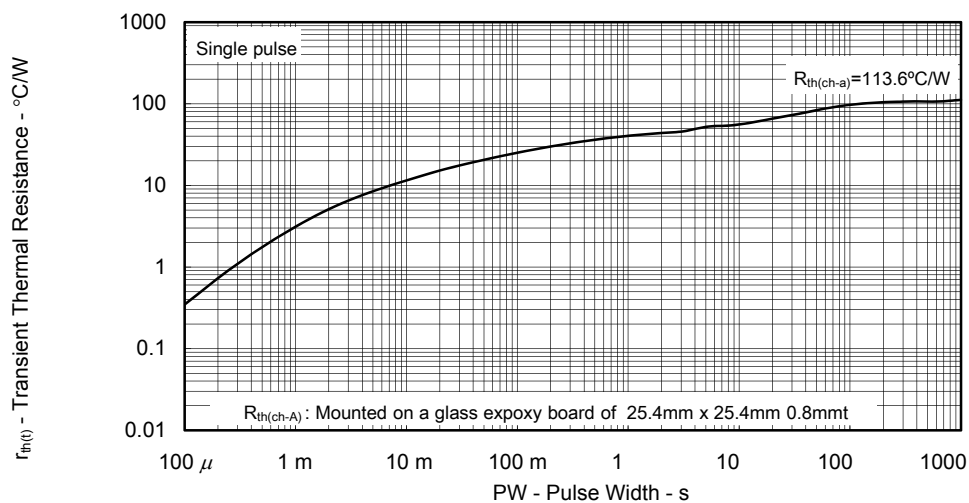
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



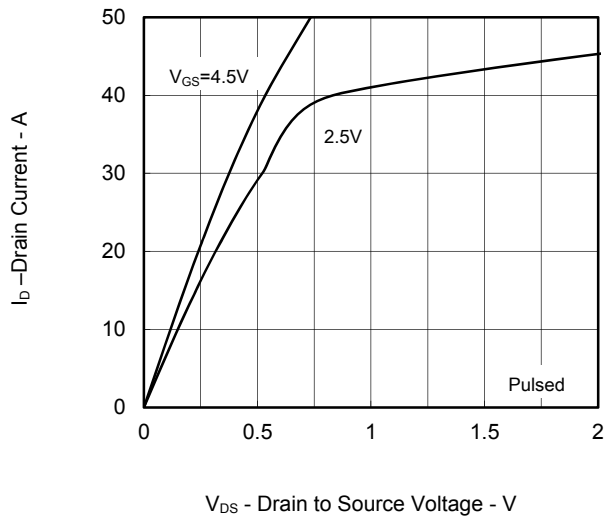
FORWARD BIAS SAFE OPERATING AREA



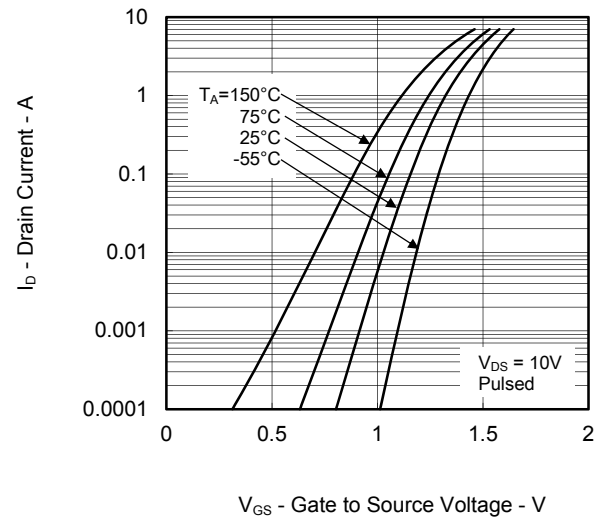
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



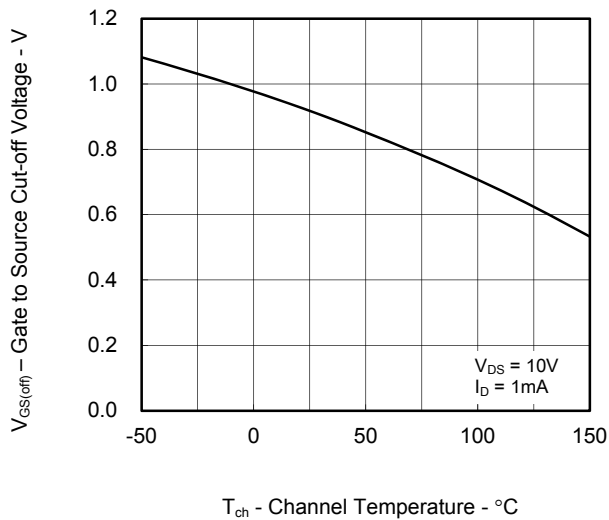
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



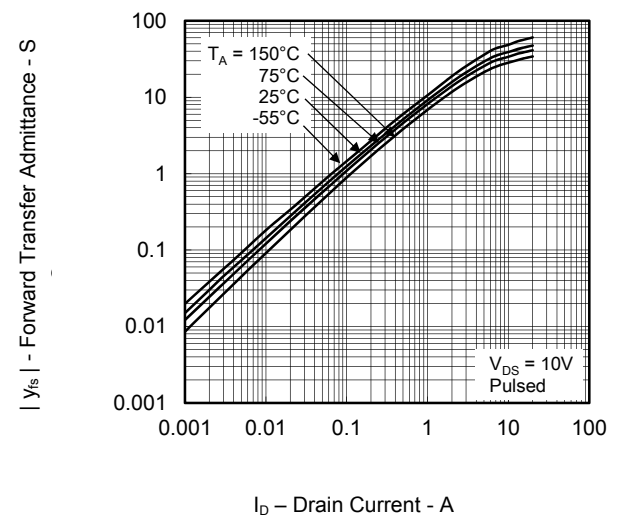
FORWARD TRANSFER CHARACTERISTICS



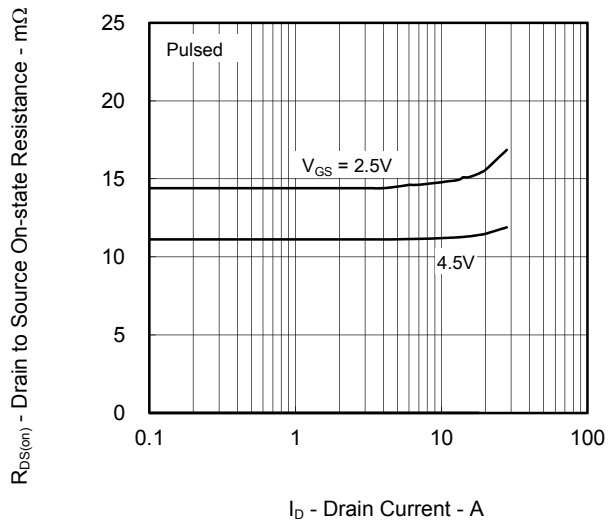
GATE TO SOURCE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



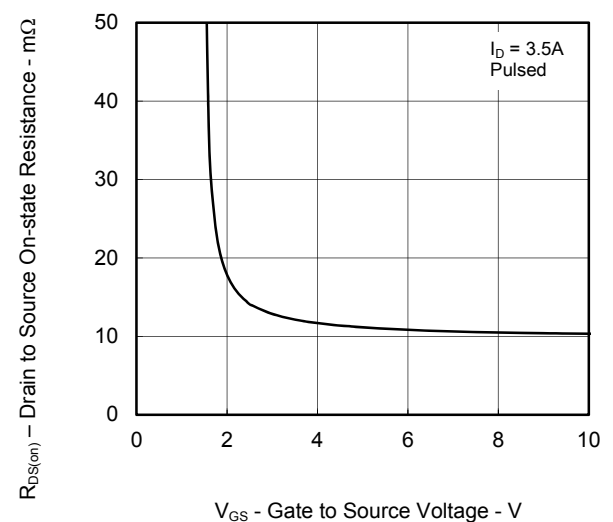
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



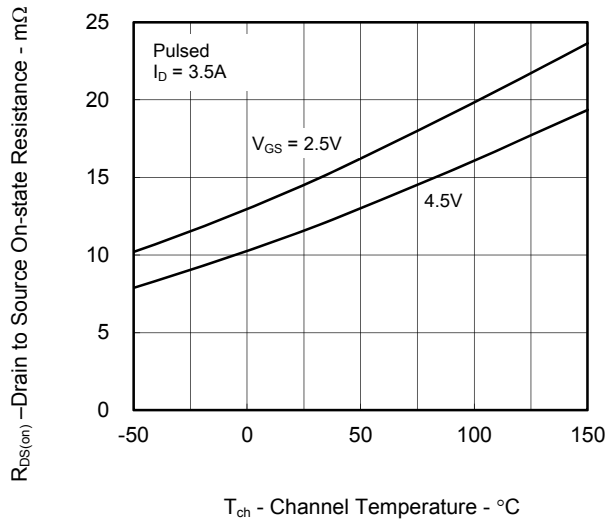
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



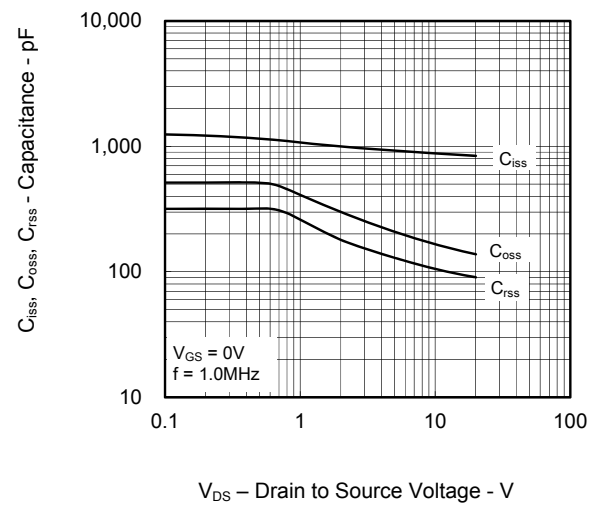
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



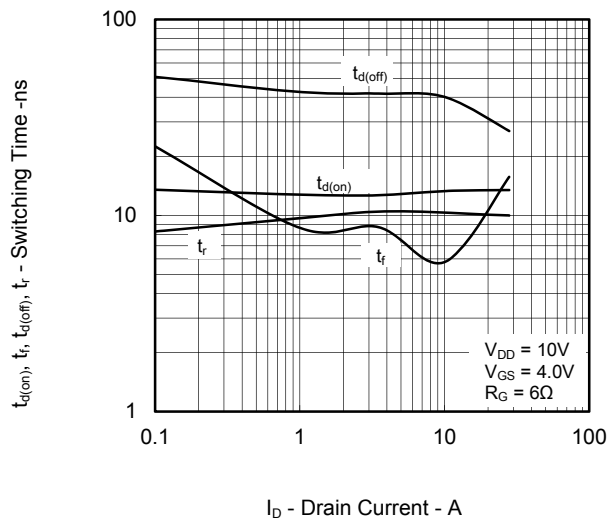
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



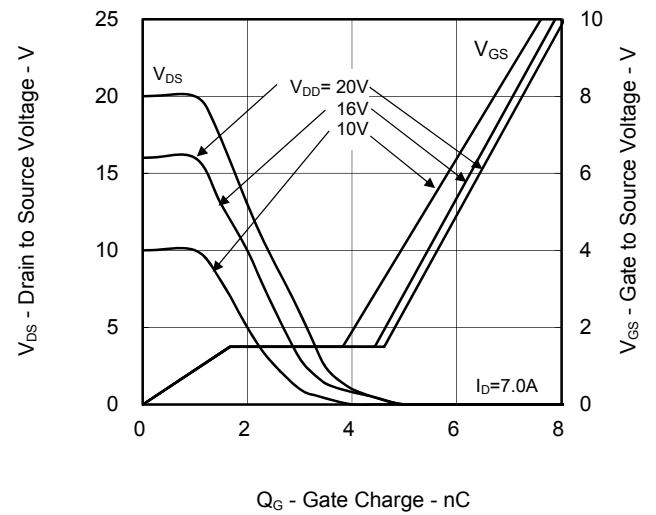
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



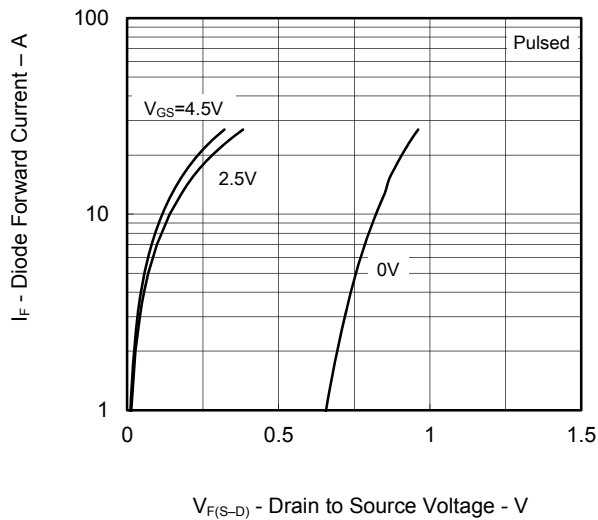
SWITCHING CHARACTERISTICS



DYNAMIC INPUT/OUTPUT CHARACTERISTICS

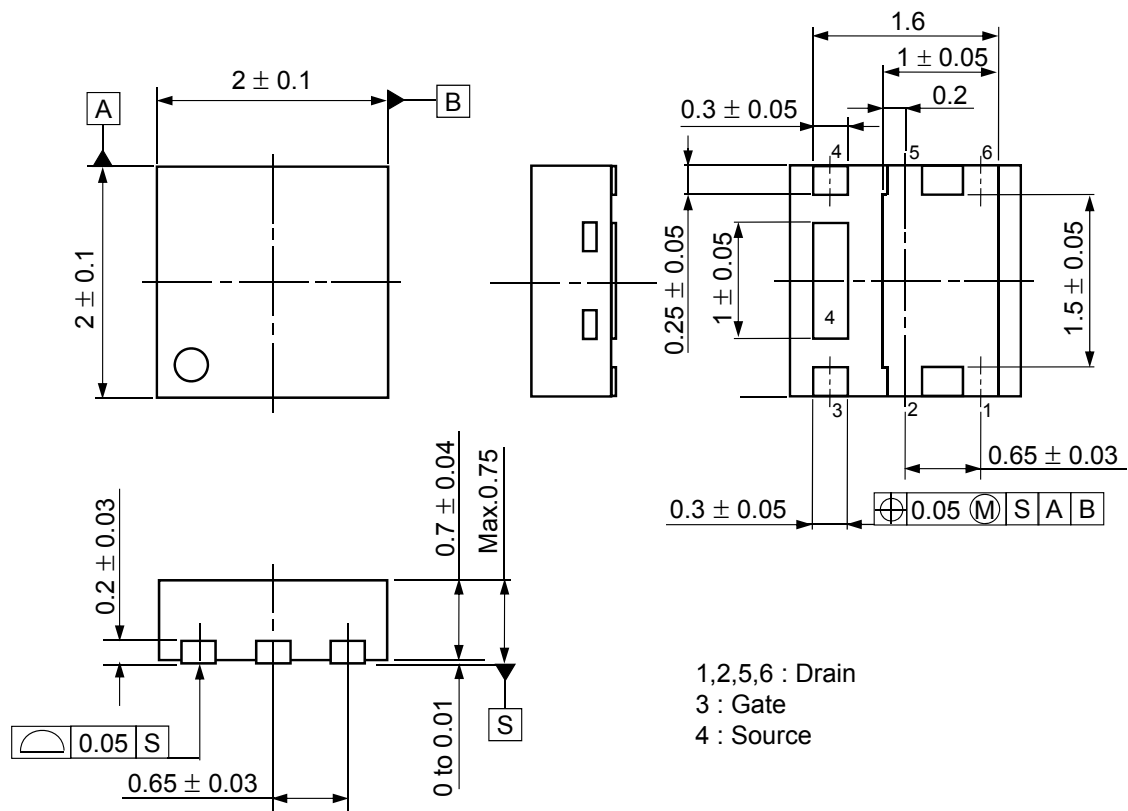


SOURCE TO DRAIN DIODE FORWARD VOLTAGE



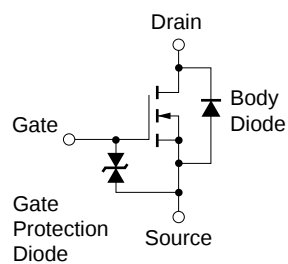
Package Drawings (Unit: mm)

6pinHUSON2020



RENESAS Package code : PWSN0006JD-B

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.

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