μPA2670T1R

DUAL P-CHANNEL MOSFET
–20 V, –3.0 A, 79 mΩ

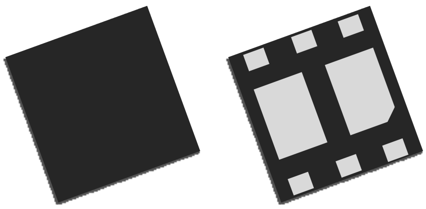
R07DS0833EJ0101
Rev.1.01
Apr 15, 2013

Description

The μPA2670T1R is Dual P-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

- −1.8V drive available
- Low on-state resistance
  — $R_{DS\,(on)1}$ = 79 mΩ MAX. (V_{GS} = –4.5 V, I_D = –1.5 A)
  — $R_{DS\,(on)2}$ = 105 mΩ MAX. (V_{GS} = –2.5 V, I_D = –1.5 A)
  — $R_{DS\,(on)3}$ = 182 mΩ MAX. (V_{GS} = –1.8 V, I_D = –1.5 A)
- Built-in gate protection diode
- Lead-free and Halogen-free



6pinHUSON2020(Dual)

Ordering Information

Part Number	Package
μPA2670T1R-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°C)

Item	Symbol	Ratings	Unit
Drain to Source Voltage (V_{GS} = 0 V)	V_{DSS}	–20	V
Gate to Source Voltage (V_{DS} = 0 V)	V_{GSS}	∓10	V
Drain Current (DC)	$I_{D(DC)}$	∓3.0	A
Drain Current (pulse) *1	$I_{D(pulse)}$	∓12	A
Total Power Dissipation (1 unit, 5 s) *2	P_{T1}	1.5	W
Total Power Dissipation (2 units, 5 s) *2	P_{T2}	2.3	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{STG}	–55 to +150	°C

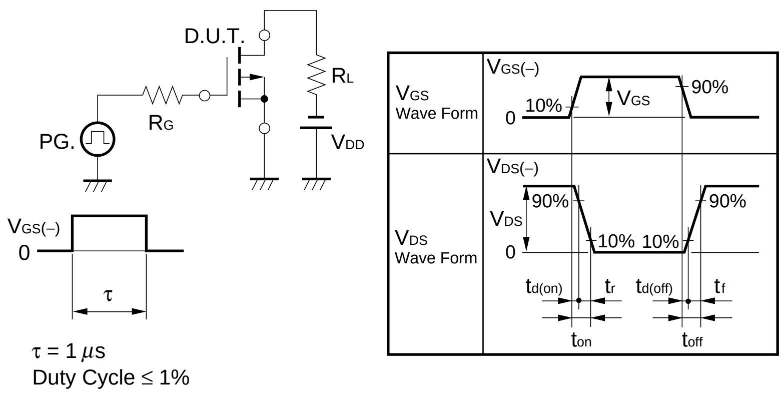
Notes: ∗1. PW≤10 μs, Duty Cycle≤1%
∗2. Mounted on glass epoxy board of 25.4mm x 25.4mm x 0.8mmt

Electrical Characteristics (T_A = 25°C)

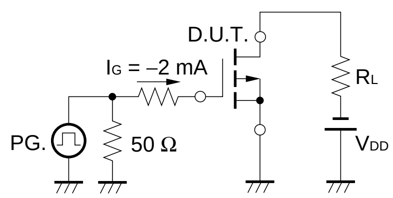
Characteristics	Symbol	MIN.	TYP.	MAX.	Unit	Test Conditions
Zero Gate Voltage Drain Current	I_{DSS}			–1.0	μA	V_{DS} = –20 V, V_{GS} = 0 V
Gate Leakage Current	I_{GSS}			∓10	μA	V_{GS} = ∓8 V, V_{DS} = 0 V
Gate Cut-off Voltage	$V_{GS(off)}$	–0.4		–1.1	V	V_{DS} = –10 V, I_D = –1 mA
Forward Transfer Admittance *1	| y_{fs} |	4.5			S	V_{DS} = –5 V, I_D = –2 A
Drain to Source On-state Resistance *1	$R_{DS(on)1}$		63	79	mΩ	V_{GS} = –4.5 V, I_D = –1.5 A
	$R_{DS(on)2}$		78	105	mΩ	V_{GS} = –2.5 V, I_D = –1.5 A
	$R_{DS(on)3}$		109	182	mΩ	V_{GS} = –1.8 V, I_D = –1.5 A
Input Capacitance	C_{iss}		473		pF	V_{DS} = –10 V, V_{GS} = 0 V, f = 1.0 MHz
Output Capacitance	C_{oss}		88		pF	
Reverse Transfer Capacitance	C_{rss}		68		pF	
Turn-on Delay Time	$t_{d (on)}$		11.5		ns	I_D = –1.5 A, V_{DD} = –10.0 V, V_{GS} = –4.0 V, R_G = 6 Ω
Rise Time	t_r		4.0		ns	
Turn-off Delay Time	$t_{d (off)}$		37.5		ns	
Fall Time	t_f		12.5		ns	
Total Gate Charge	Q_G		5.1		nC	I_D = –3.0 A , V_{DD} = –16 V, V_{GS} = –4.5 V
Gate to Source Charge	Q_{GS}		0.9		nC	
Gate to Drain Charge	Q_{GD}		1.5		nC	
Body Diode Forward Voltage *1	$V_{F(S–D)}$			1.5	V	I_F = 3.0 A, V_{GS} = 0 V

Note: ∗1. Pulsed

TEST CIRCUIT 1 SWITCHING TIME

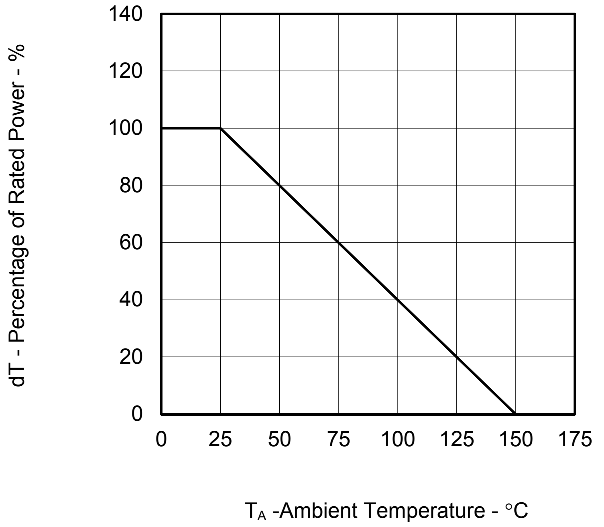


TEST CIRCUIT 2 GATE CHARGE

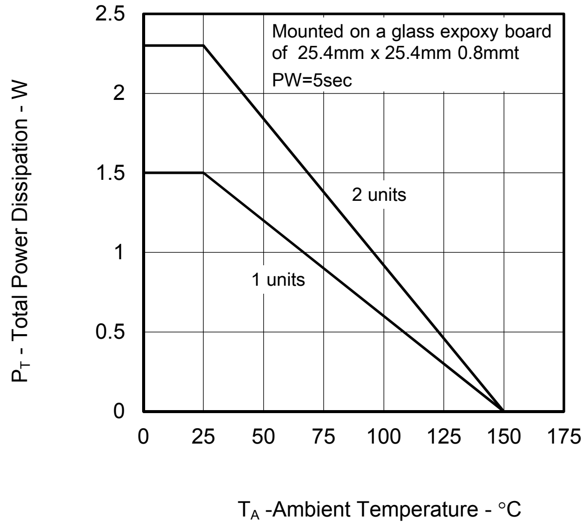


Typical Characteristics (T_A = 25°C)

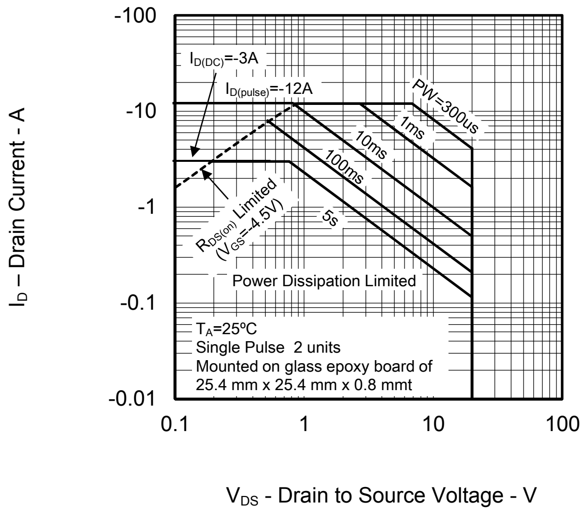
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



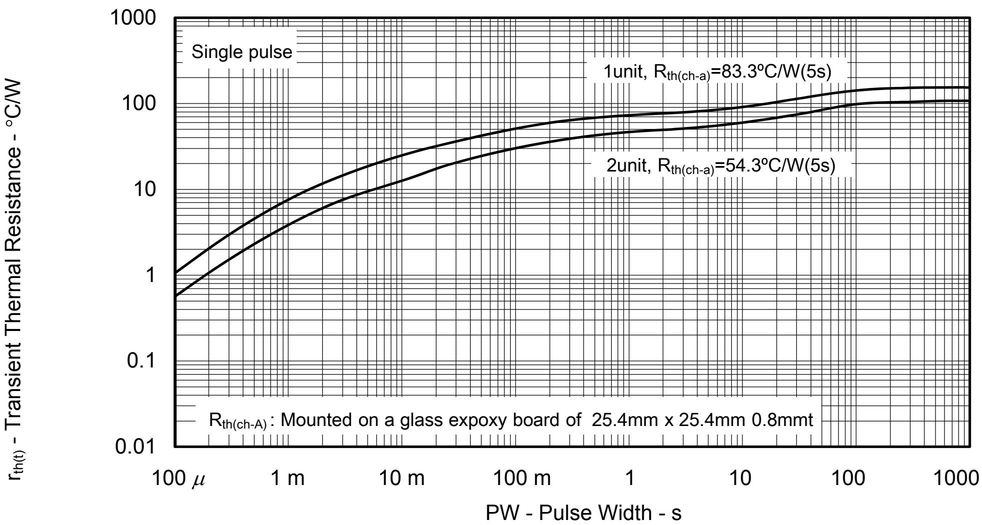
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



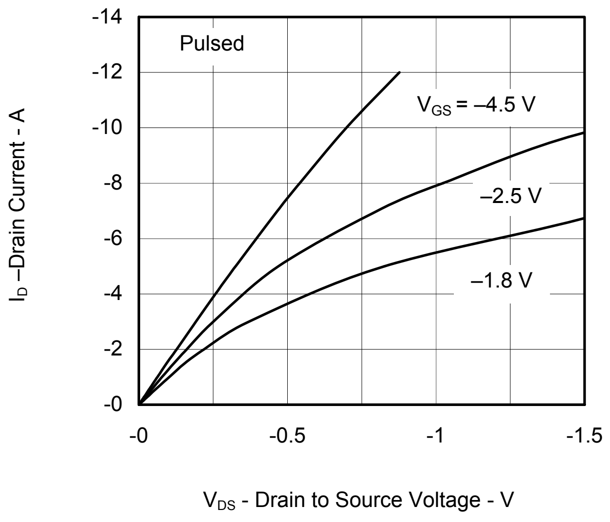
FORWARD BIAS SAFE OPERATING AREA



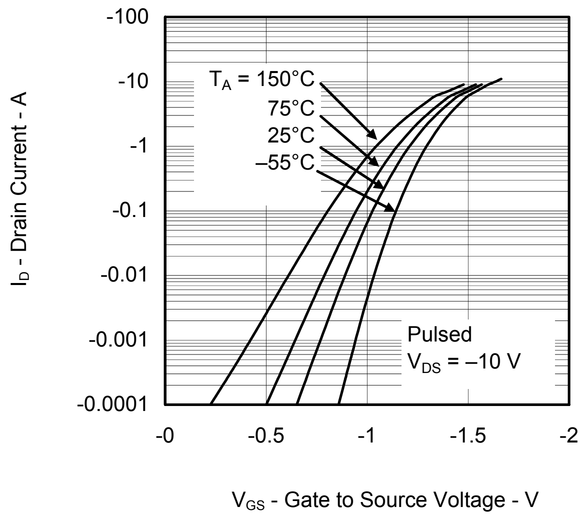
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



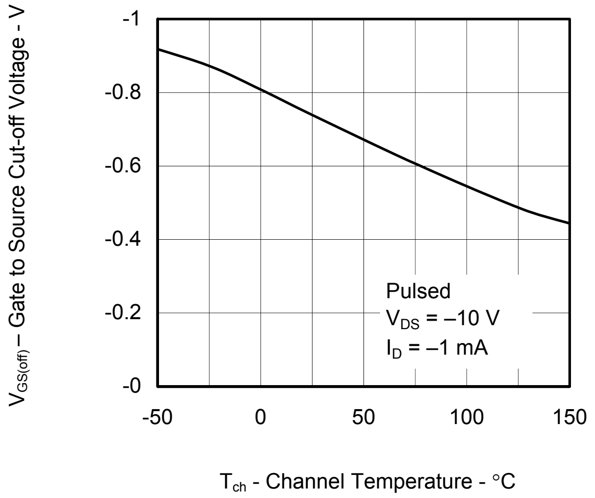
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



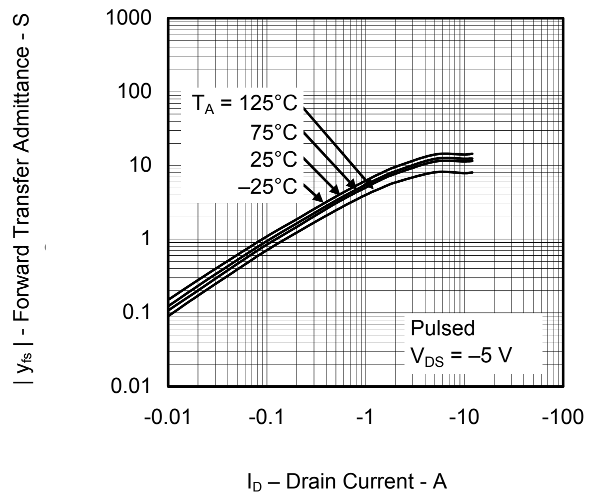
FORWARD TRANSFER CHARACTERISTICS



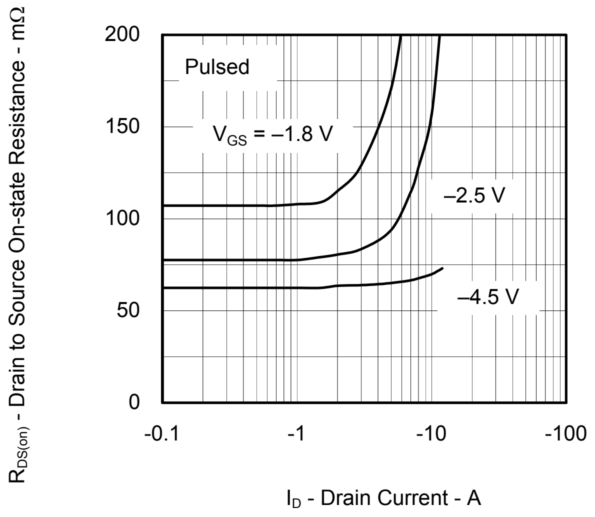
GATE TO SOURCE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



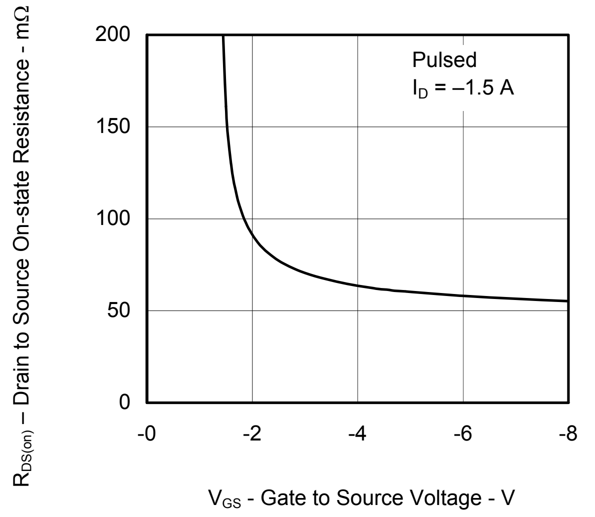
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



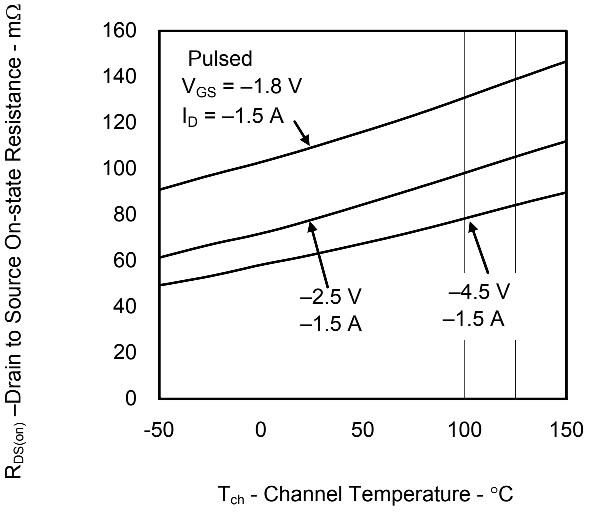
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



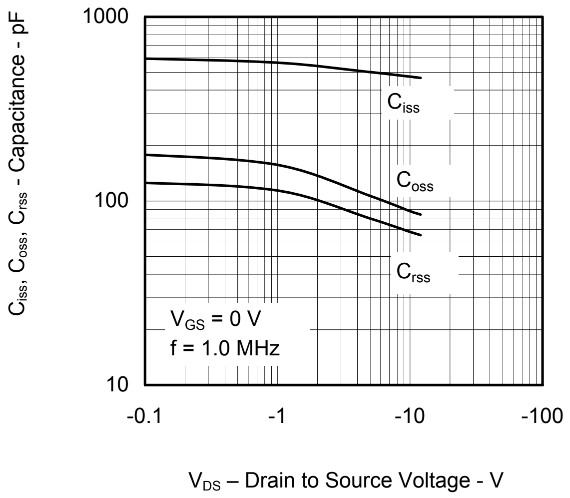
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



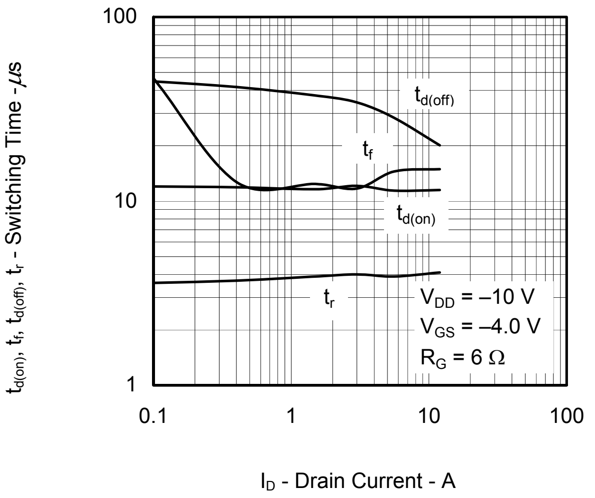
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



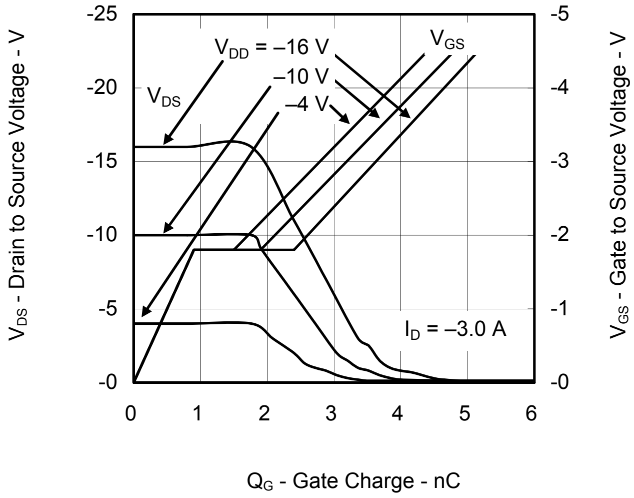
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



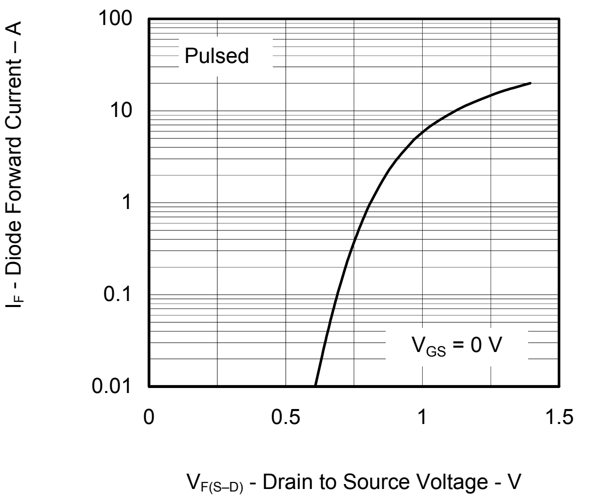
SWITCHING CHARACTERISTICS



DYNAMIC INPUT/OUTPUT CHARACTERISTICS

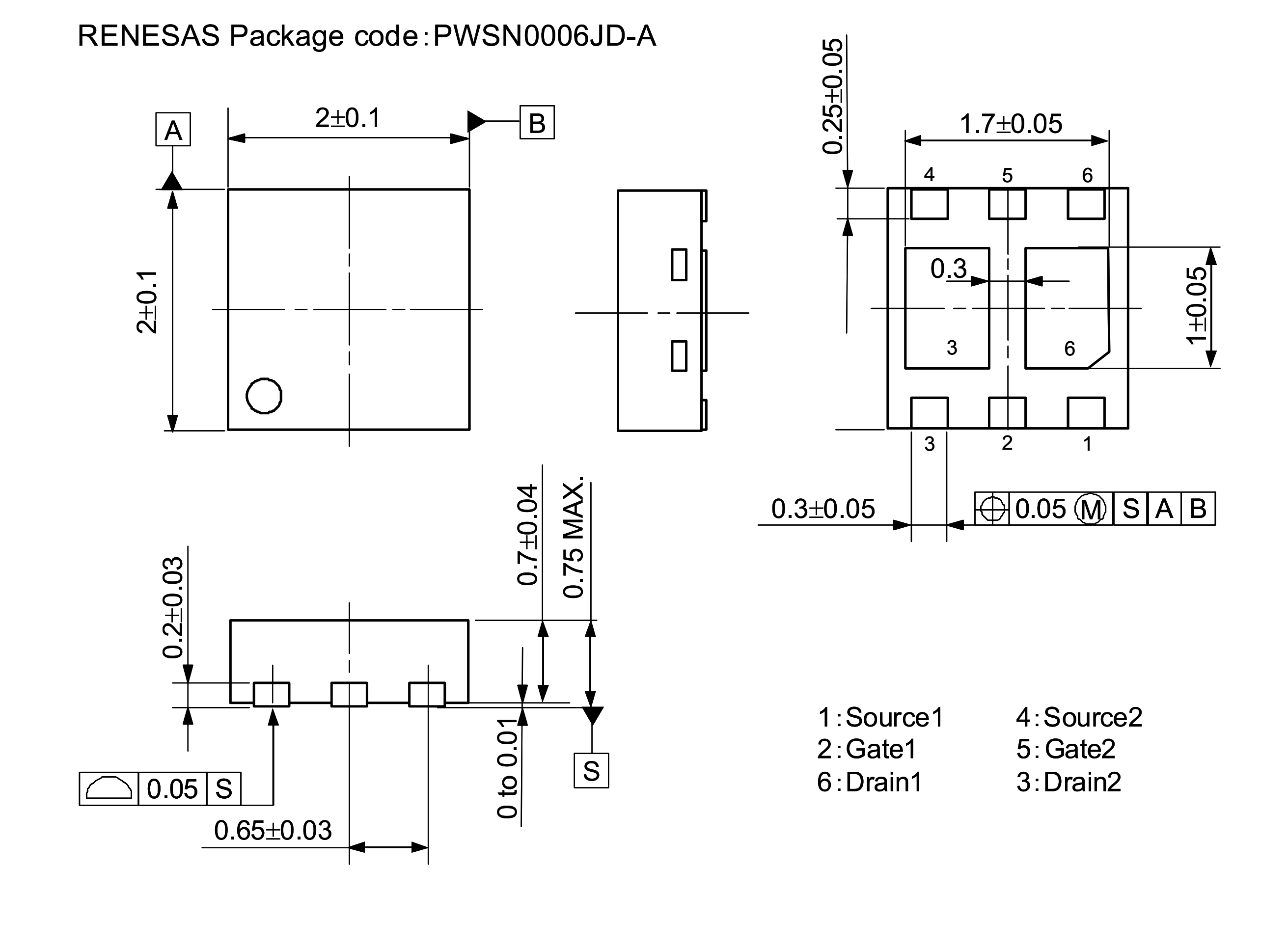


SOURCE TO DRAIN DIODE FORWARD VOLTAGE

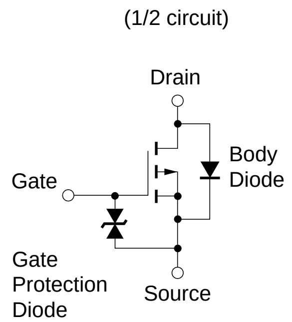


Package Drawings (Unit: mm)

6pinHUSON2020



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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Refer to "http://www.renesas.com/" for the latest and detailed information.

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