

# HAT2105R

## Silicon N Channel Power MOS FET High Speed Power Switching

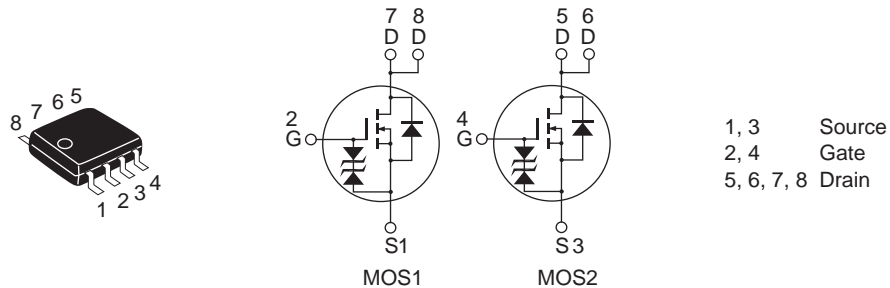
R07DS0552EJ0200  
(Previous: REJ03G1369-0100)  
Rev.2.00  
Oct 11, 2011

### Features

- Low on-resistance  
 $R_{DS(on)} = 1.6 \Omega$  typ. (at  $I_D = 0.5 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$ ,  $T_a = 25^\circ\text{C}$ )
- Capable of 4 V gate drive
- High density mounting

### Outline

RENESAS Package code: PRSP0008DD-D  
(Package name: SOP-8<FP-8DAV>)



### Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	200	V
Gate to source voltage	$V_{GSS}$	$\pm 15$	V
Drain current	$I_D$	0.5	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	2	A
Body-drain diode reverse drain current	$I_{DR}$	0.5	A
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	1.3	W
	$P_{ch}$ <sup>Note3</sup>	2	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. 1 Drive operation ; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm),  $PW \leq 10 \text{ s}$

3. 2 Drive operation ; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm),  $PW \leq 10 \text{ s}$

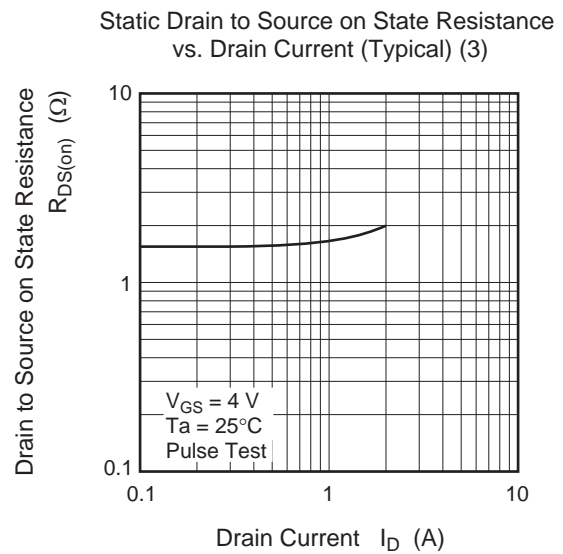
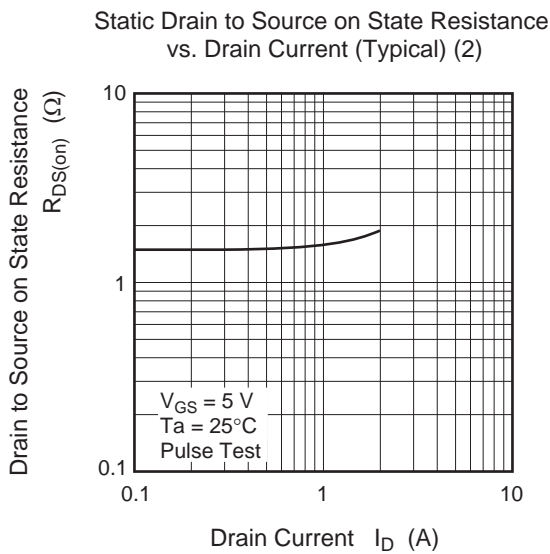
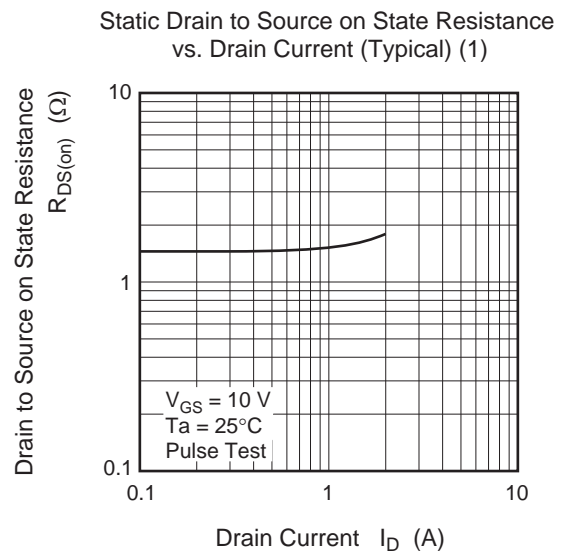
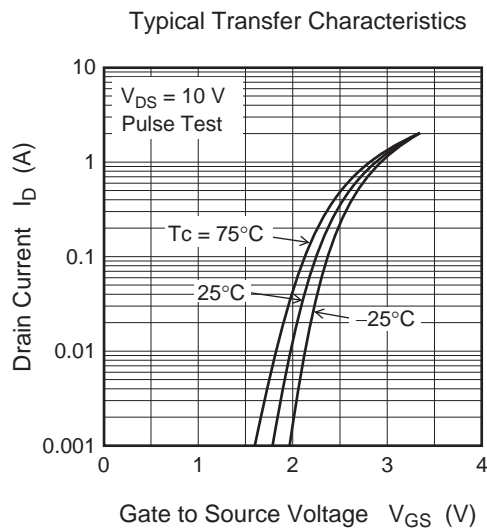
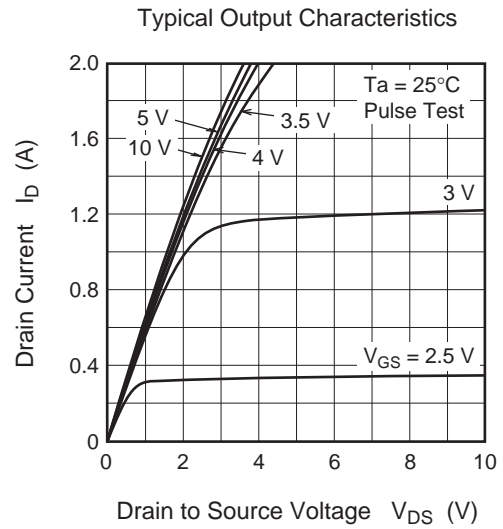
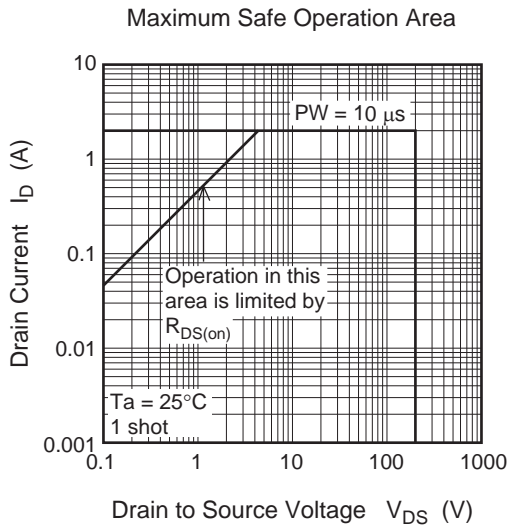
## Electrical Characteristics

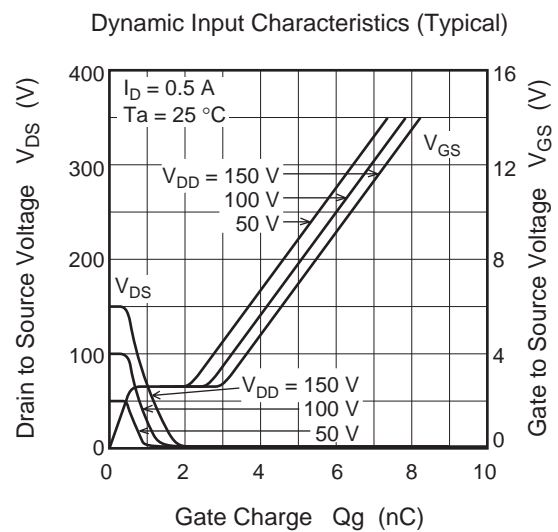
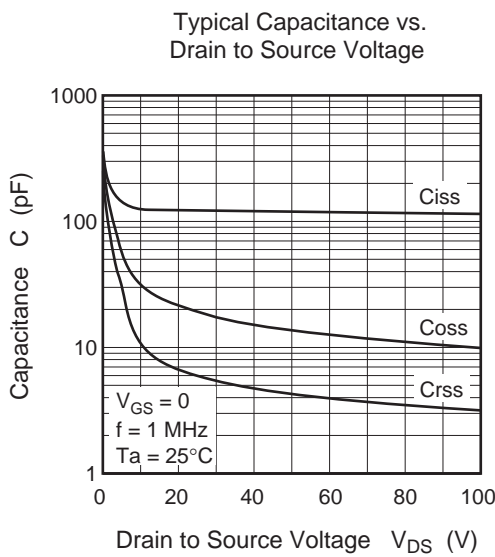
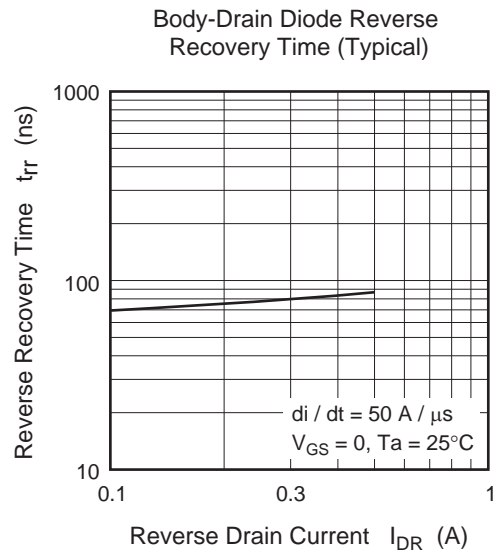
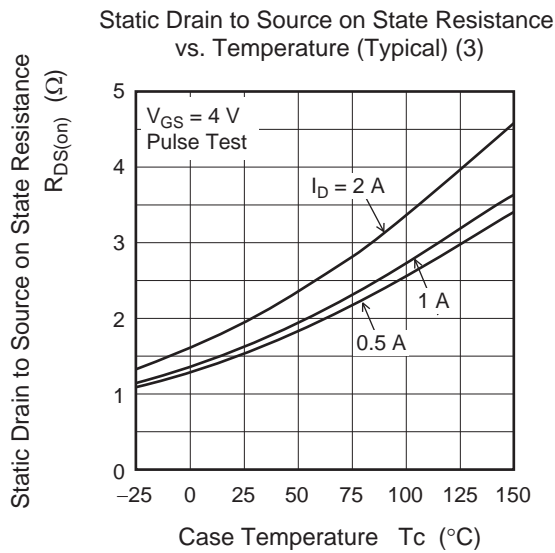
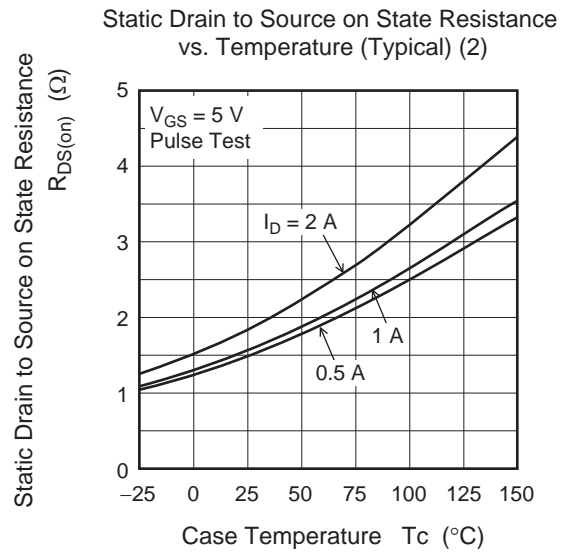
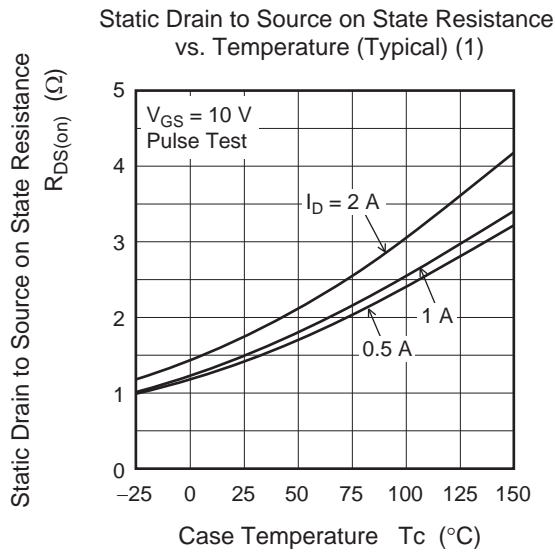
(Ta = 25°C)

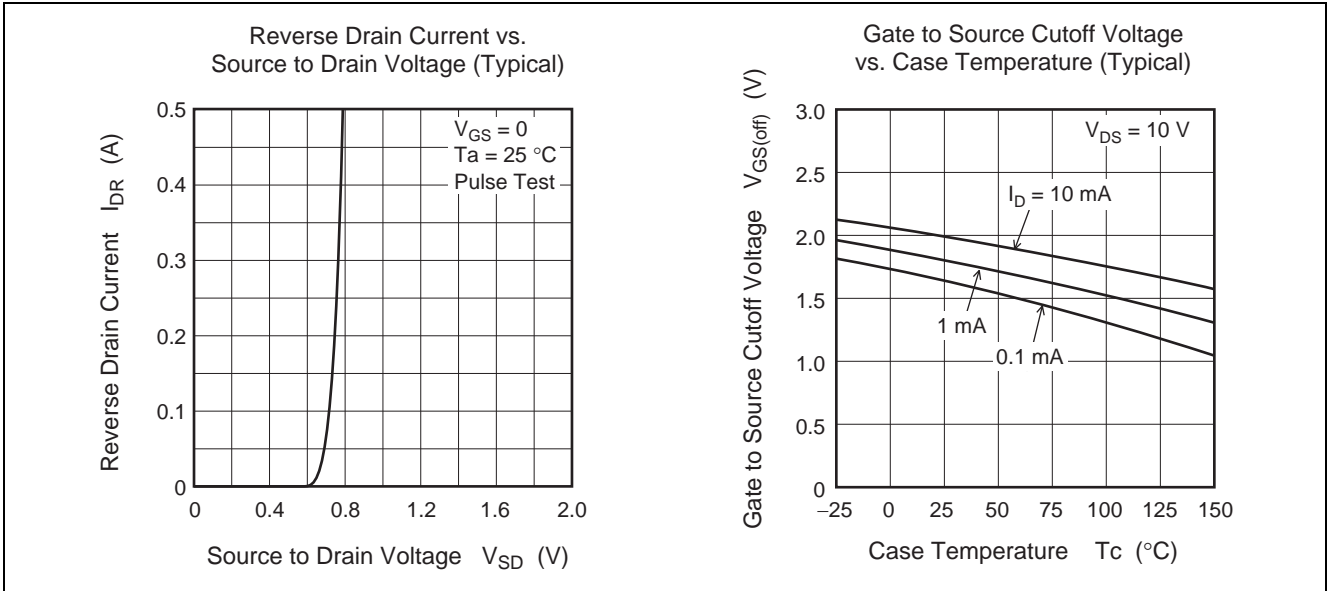
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	200	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 15$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 12 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	5	$\mu\text{A}$	$V_{DS} = 200 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.1	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	1.6	2.2	$\Omega$	$I_D = 0.5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	1.9	2.7	$\Omega$	$I_D = 0.5 \text{ A}$ , $V_{GS} = 4 \text{ V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	2.4	5.5	$\Omega$	$I_D = 2 \text{ A}$ , $V_{GS} = 5 \text{ V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	0.56	0.86	—	S	$I_D = 0.5 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	120	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	29	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	10	—	pF	
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	$V_{GS} = 5 \text{ V}$ , $I_D = 0.5 \text{ A}$ , $V_{DD} \cong 30 \text{ V}$
Rise time	$t_r$	—	14	—	ns	
Turn-off delay time	$t_{d(off)}$	—	24	—	ns	
Fall time	$t_f$	—	9	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	0.9	1.4	V	$I_F = 0.5 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>

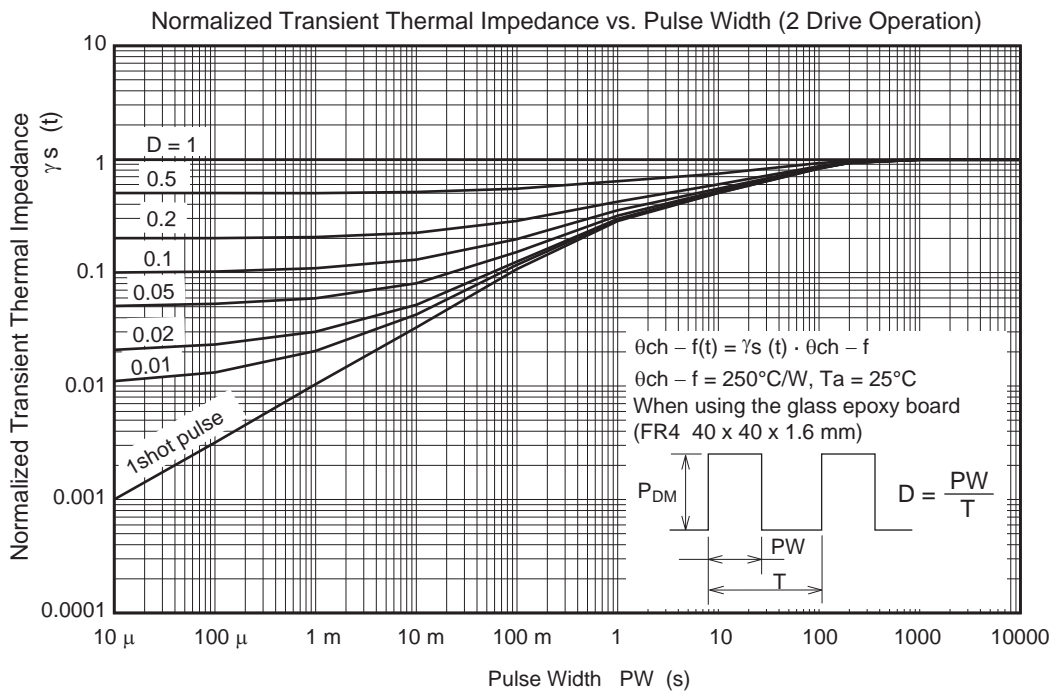
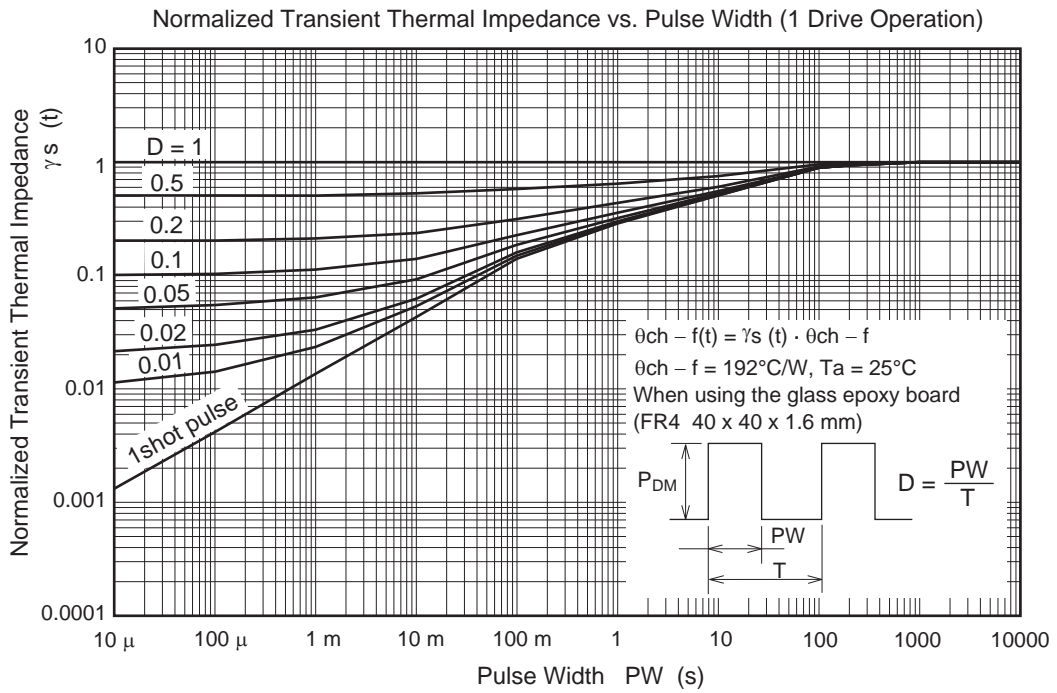
Notes: 4. Pulse test

Main Characteristics



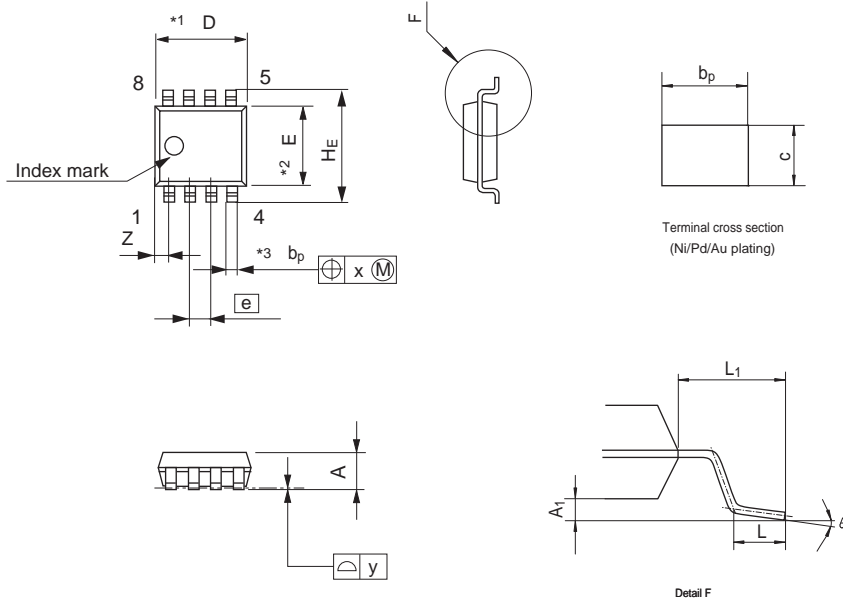






### Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
SOP-8	P-SOP8-3.95 × 4.9-1.27	PRSP0008DD-D	FP-8DAV	0.085g



NOTE)  
 1. DIMENSIONS \*\*1(Nom)\*\* AND \*\*2\*\* DO NOT INCLUDE MOLD FLASH.  
 2. DIMENSION \*\*3\* DOES NOT INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	4.90	5.3
E	—	3.95	—
A <sub>2</sub>	—	—	—
A <sub>1</sub>	0.10	0.14	0.25
A	—	—	1.75
b <sub>p</sub>	0.34	0.40	0.46
b <sub>1</sub>	—	—	—
c	0.15	0.20	0.25
c <sub>1</sub>	—	—	—
θ	0°	—	8°
H <sub>E</sub>	5.80	6.10	6.20
Ⓜ	—	1.27	—
x	—	—	0.25
y	—	—	0.1
Z	—	—	0.75
L	0.40	0.60	1.27
L <sub>1</sub>	—	1.08	—

### Ordering Information

Orderable Part Number	Quantity	Shipping Container
HAT2105R-EL-E	2500 pcs	Taping

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