

## HAT1054R

Silicon P Channel Power MOS FET  
High Speed Power Switching

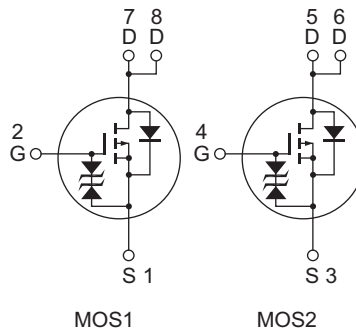
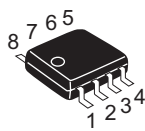
REJ03G1154-0300  
(Previous: ADE-208-1224A)  
Rev.3.00  
Sep 07, 2005

### Features

- Low on-resistance
- Capable of 2.5 V gate drive
- Low drive current
- High density mounting

### Outline

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



1, 3      Source  
2, 4      Gate  
5, 6, 7, 8      Drain

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	$V_{DSS}$	-20	V
Gate to source voltage	$V_{GSS}$	±12	V
Drain current	$I_D$	-6	A
Drain peak current	$I_{D(pulse)}$ <sup>Note 1</sup>	-48	A
Body-drain diode reverse drain current	$I_{DR}$	-6	A
Channel dissipation	$P_{ch}$ <sup>Note 2</sup>	2	W
Channel dissipation	$P_{ch}$ <sup>Note 3</sup>	3	W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$ 2. 1 Drive operation: When using the glass epoxy board (FR4 40 × 40 × 1.6 mm),  $PW \leq 10 s$ 3. 2 Drive operation: When using the glass epoxy board (FR4 40 × 40 × 1.6 mm),  $PW \leq 10 s$ 

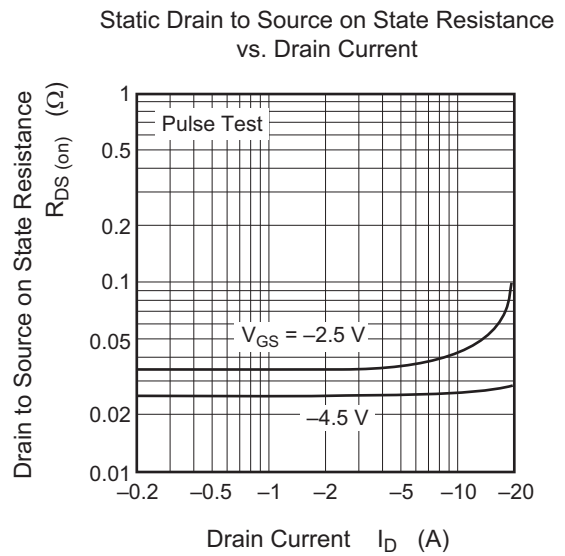
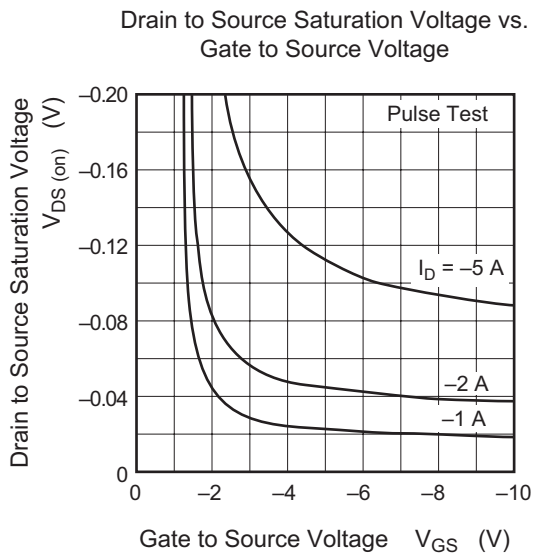
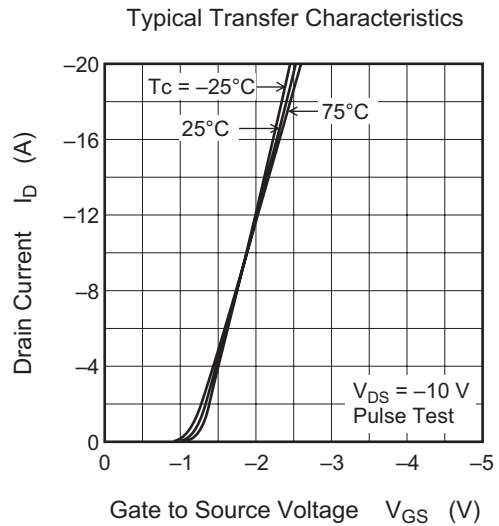
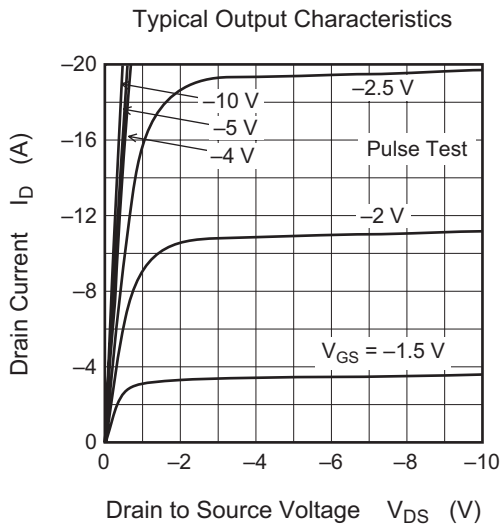
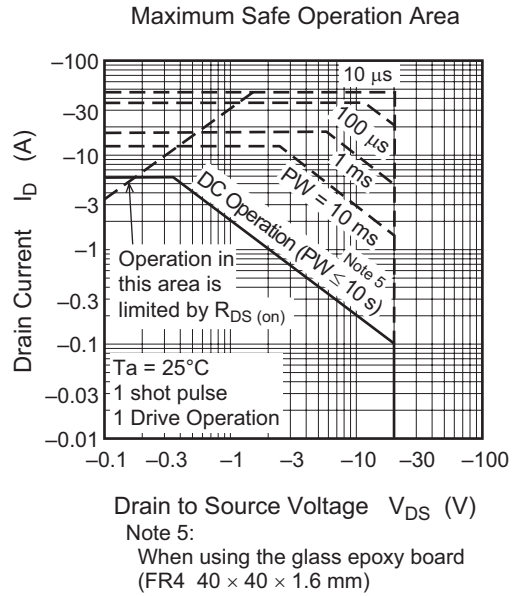
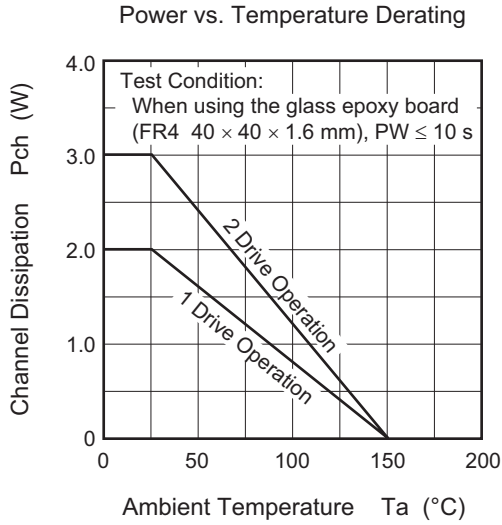
## Electrical Characteristics

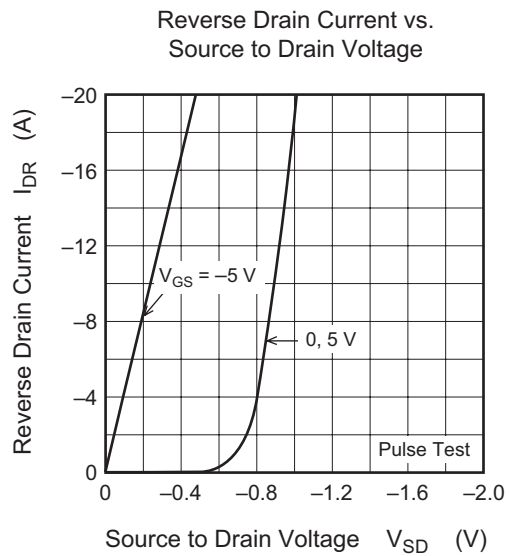
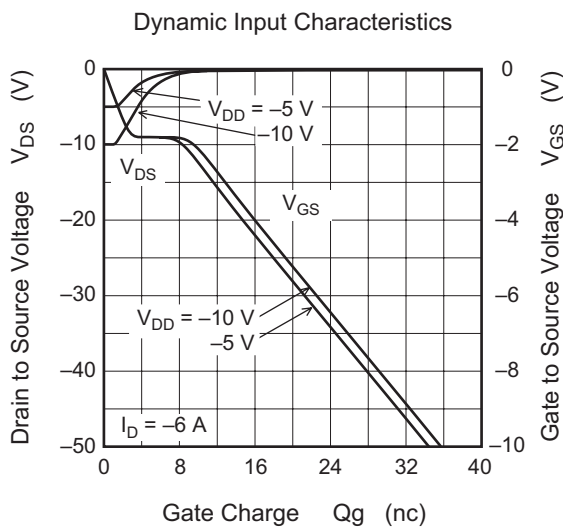
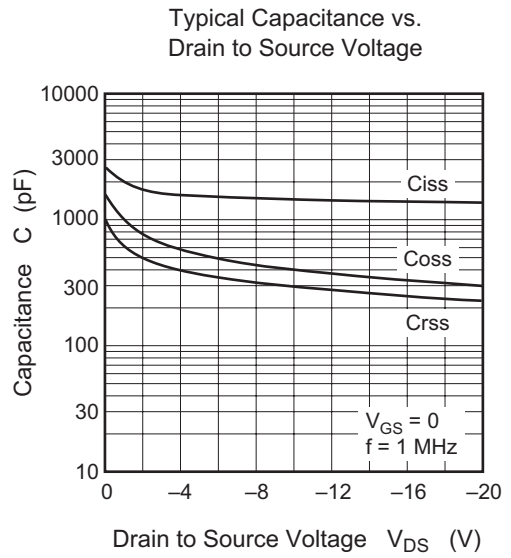
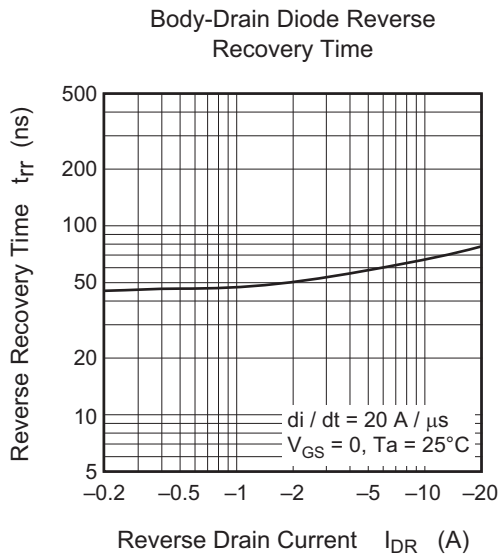
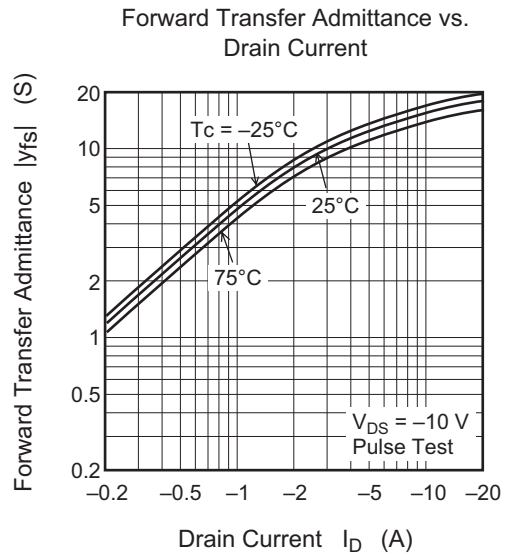
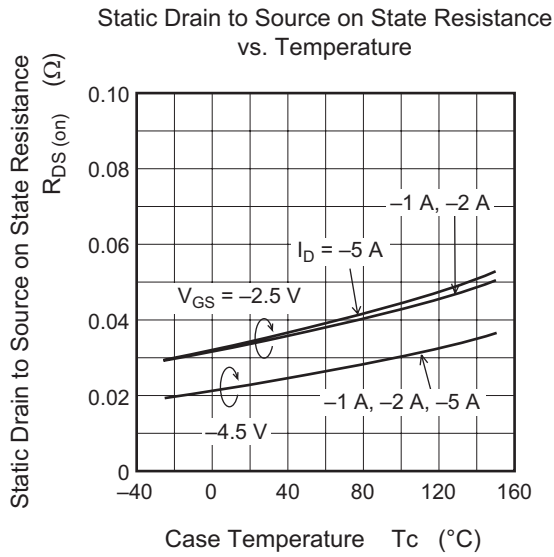
(Ta = 25°C)

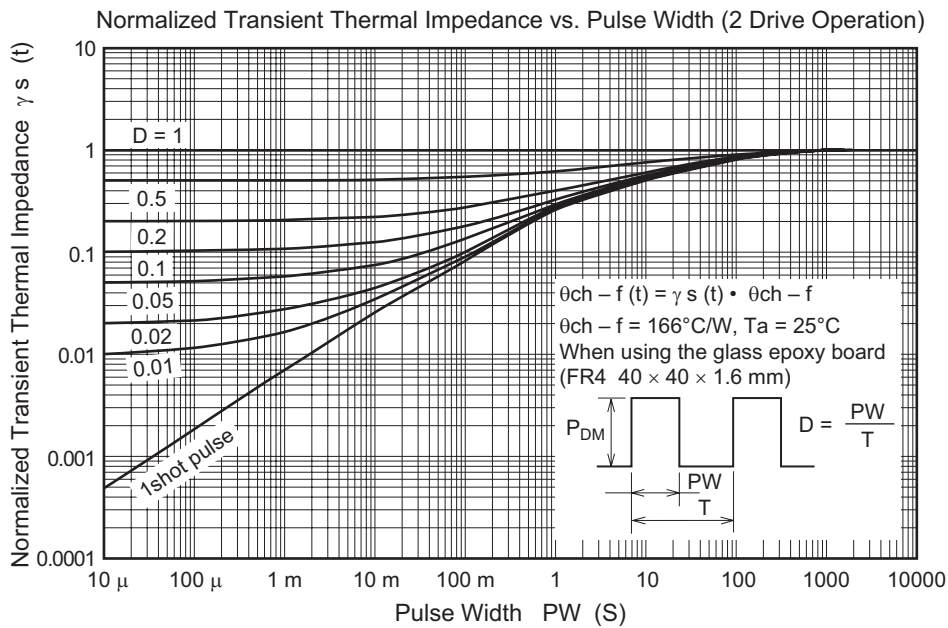
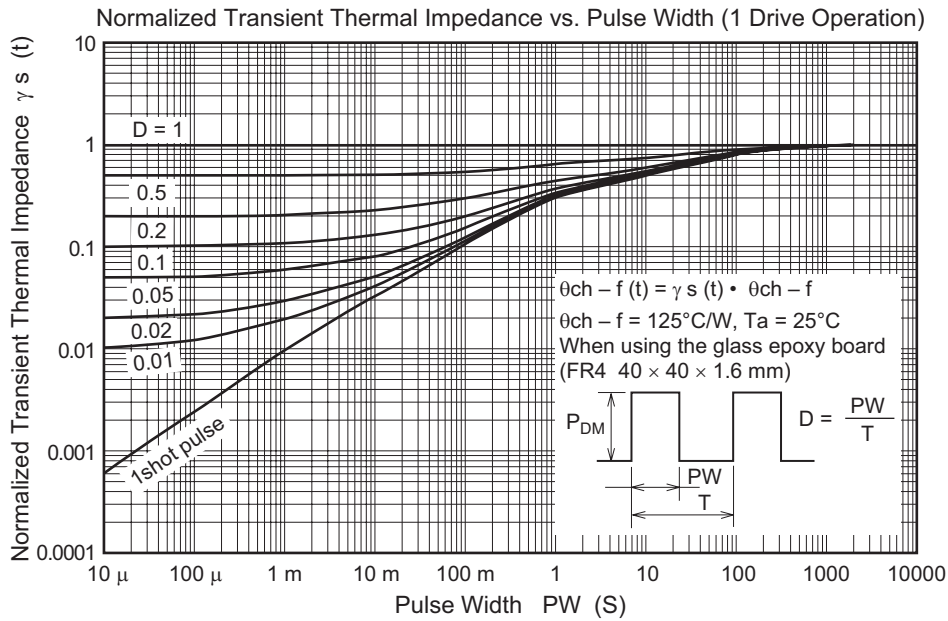
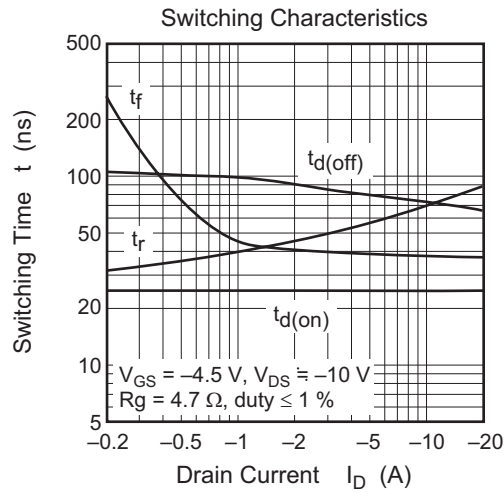
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-20	—	—	V	$I_D = -10 mA$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±12	—	—	V	$I_G = \pm 100 \mu A$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 10 V$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	-1	μA	$V_{DS} = -20 V$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-0.4	—	-1.4	V	$V_{DS} = -10 V$ , $I_D = -1 mA$
Static drain to source on state resistance	$R_{DS(on)}$	—	24	30	mΩ	$I_D = -3 A$ , $V_{GS} = -4.5 V$ <sup>Note 4</sup>
	$R_{DS(on)}$	—	35	50	mΩ	$I_D = -3 A$ , $V_{GS} = -2.5 V$ <sup>Note 4</sup>
Forward transfer admittance	$ y_{fs} $	6	10	—	S	$I_D = -3 A$ , $V_{DS} = -10 V$ <sup>Note 4</sup>
Input capacitance	$C_{iss}$	—	1550	—	pF	$V_{DS} = -10 V$
Output capacitance	$C_{oss}$	—	400	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	300	—	pF	$f = 1 MHz$
Total gate charge	$Q_g$	—	18	—	nC	$V_{DD} = -10 V$
Gate to source charge	$Q_{gs}$	—	3	—	nC	$V_{GS} = -4.5 V$
Gate to drain charge	$Q_{gd}$	—	6.5	—	nC	$I_D = -6 A$
Turn-on delay time	$t_{d(on)}$	—	25	—	ns	$V_{GS} = -4.5 V$ , $I_D = -3 A$ ,
Rise time	$t_r$	—	50	—	ns	$V_{DD} \cong -10 V$
Turn-off delay time	$t_{d(off)}$	—	85	—	ns	$R_L = 3.3 \Omega$
Fall time	$t_f$	—	40	—	ns	$R_g = 4.7 \Omega$
Body-drain diode forward voltage	$V_{DF}$	—	-0.85	-1.10	V	$I_F = -6 A$ , $V_{GS} = 0$ <sup>Note 4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	60	—	ns	$I_F = -6 A$ , $V_{GS} = 0$ $di_F/dt = 20 A/\mu s$

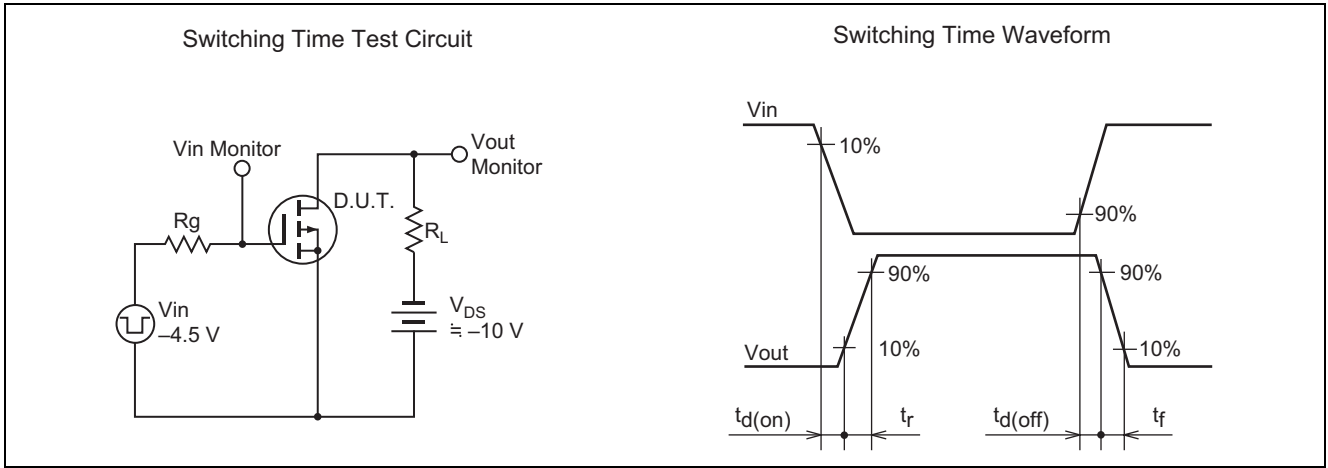
Note: 4. Pulse test

Main Characteristics

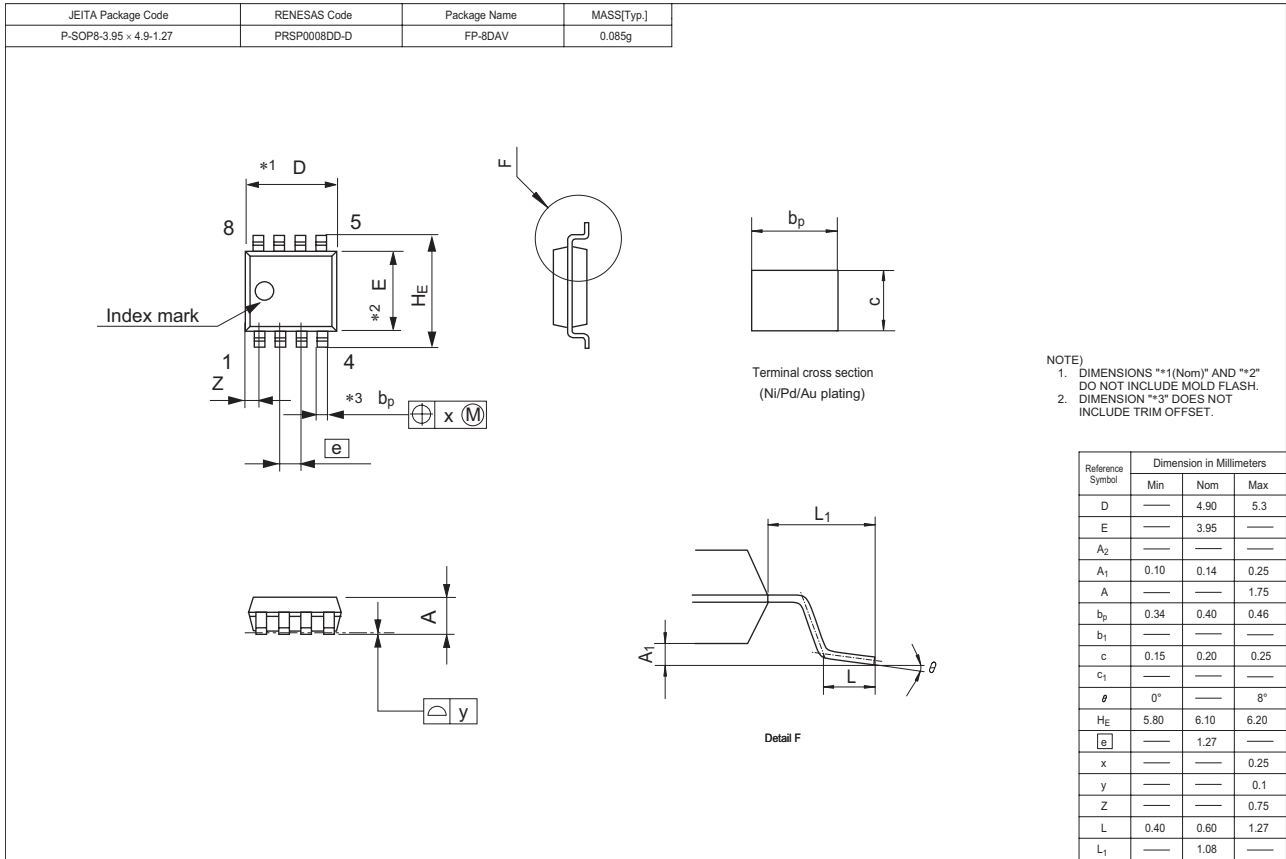








### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
HAT1054R-EL-E	2500 pcs	Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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