

# H5N2005DL, H5N2005DS

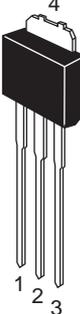
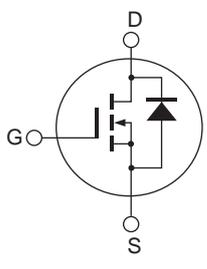
200V - 6A - MOS FET  
High Speed Power Switching

R07DS0796EJ0400  
(Previous: REJ03G1104-0300)  
Rev.4.00  
Jun 07, 2012

## Features

- Low on-resistance  
 $R_{DS(on)} = 0.52 \Omega$  typ. (at  $I_D = 3 A$ ,  $V_{GS} = 10 V$ ,  $T_a = 25^\circ C$ )
- Low drive power
- High speed switching

## Outline

RENESAS Package code: PRSS0004ZD-B (Package name: DPAK(L)-(2) )	RENESAS Package code: PRSS0004ZD-C (Package name: DPAK(S) )
	
	
1. Gate 2. Drain 3. Source 4. Drain	

## Absolute Maximum Ratings

( $T_a = 25^\circ C$ )

Item	Symbol	Value	Unit
Drain to source voltage	$V_{DSS}$	200	V
Gate to source voltage	$V_{GSS}$	$\pm 30$	V
Drain current	$I_D$	6	A
Drain peak current	$I_{D(pulse)}$ <sup>Note 1</sup>	24	A
Body-drain diode reverse drain current	$I_{DR}$	6	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ <sup>Note 1</sup>	24	A
Avalanche current	$I_{AP}$ <sup>Note 3</sup>	6	A
Channel dissipation	$P_{ch}$ <sup>Note 2</sup>	25	W
Channel to case thermal Impedance	$\theta_{ch-c}$	5	$^\circ C/W$
Channel temperature	$T_{ch}$	150	$^\circ C$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ C$

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$

2. Value at  $T_c = 25^\circ C$

3.  $STch = 25^\circ C$ ,  $T_{ch} \leq 150^\circ C$

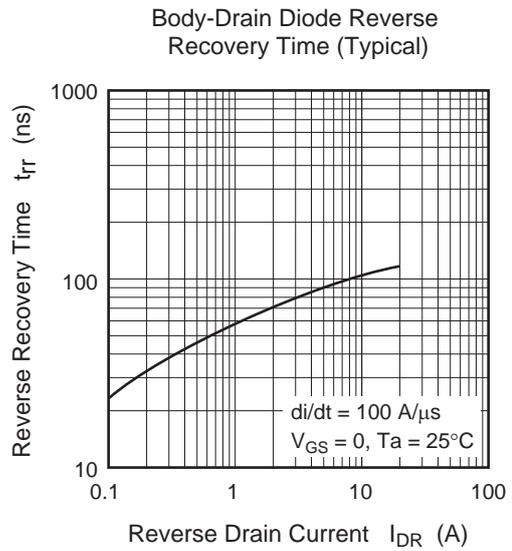
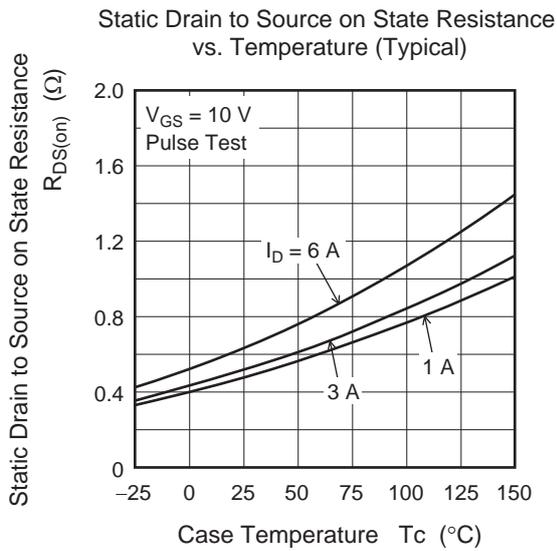
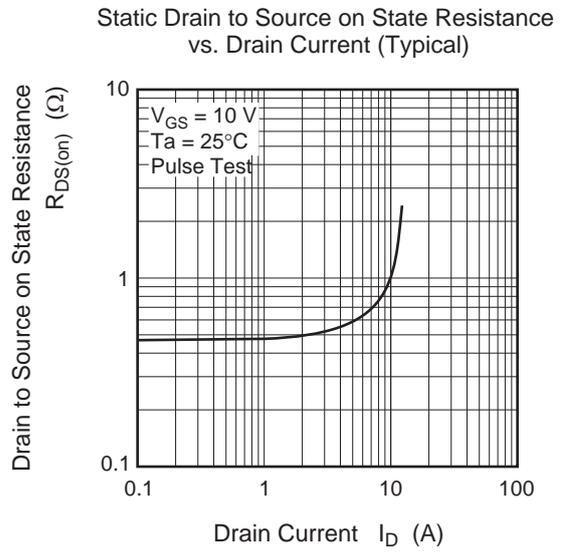
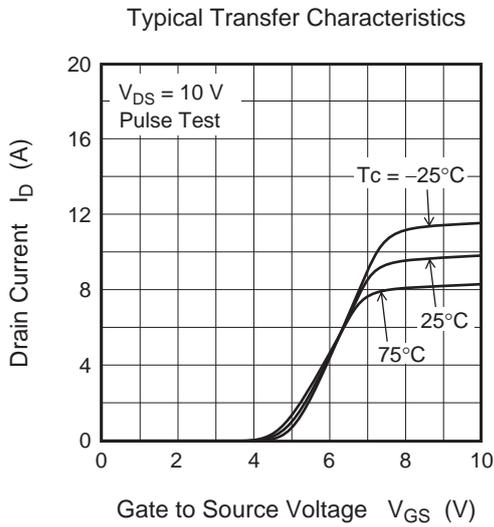
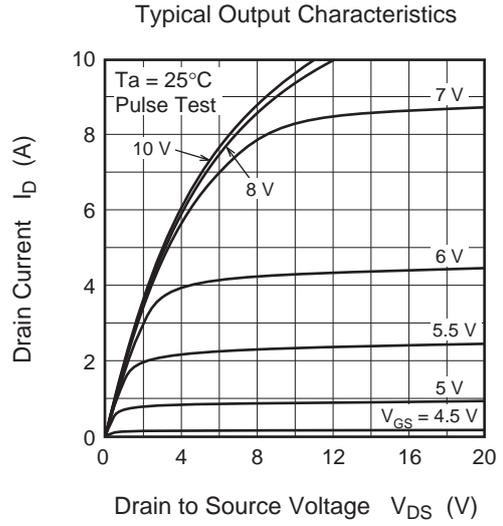
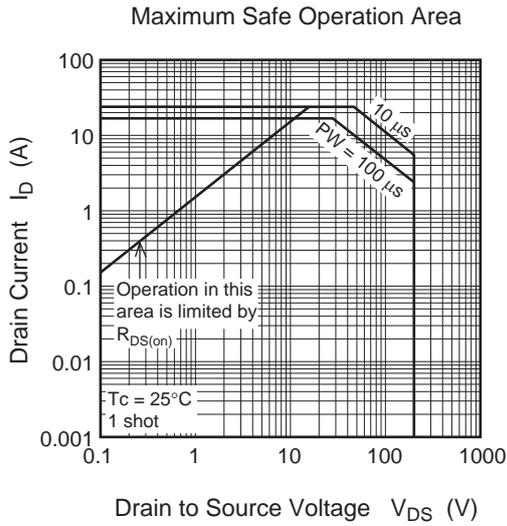
## Electrical Characteristics

(Ta = 25°C)

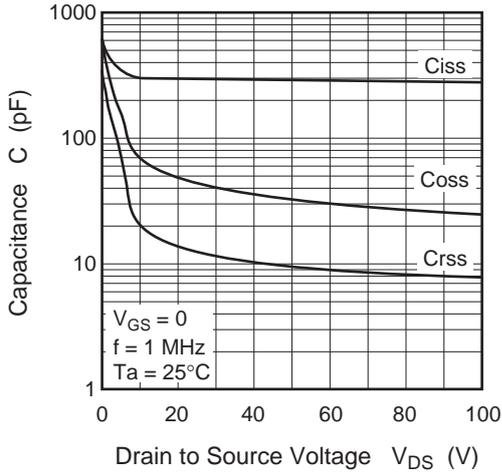
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	200	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 200 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	—	4.5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.52	0.65	$\Omega$	$I_D = 3 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note 4</sup>
Forward transfer admittance	$ y_{fs} $	2.0	3.4	—	S	$I_D = 3 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note 4</sup>
Input capacitance	$C_{iss}$	—	300	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	$C_{oss}$	—	44	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	12.5	—	pF	$f = 1 \text{ MHz}$
Total gate charge	$Q_g$	—	9.8	—	nC	$V_{DD} = 160 \text{ V}$
Gate to source charge	$Q_{gs}$	—	2.0	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	5.2	—	nC	$I_D = 6 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	23	—	ns	$I_D = 3 \text{ A}$
Rise time	$t_r$	—	24	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	43.5	—	ns	$R_L = 33.3 \Omega$
Fall time	$t_f$	—	11	—	ns	$R_g = 10 \Omega$
Body-drain diode forward voltage	$V_{DF}$	—	1.0	1.5	V	$I_F = 6 \text{ A}$ , $V_{GS} = 0$ <sup>Note 4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	90	—	ns	$I_F = 6 \text{ A}$ , $V_{GS} = 0$
Body-drain diode reverse recovery charge	$Q_{rr}$	—	300	—	nC	$di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

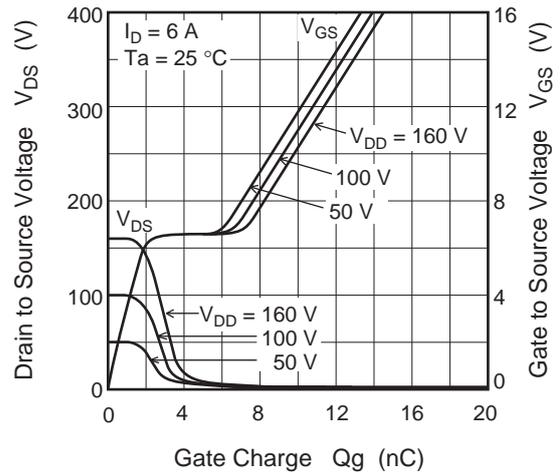
Main Characteristics



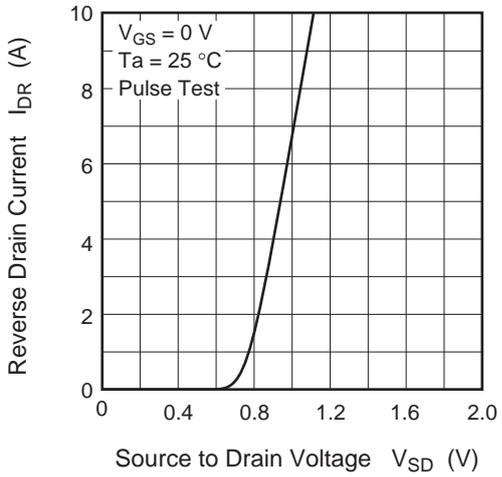
Typical Capacitance vs. Drain to Source Voltage (Typical)



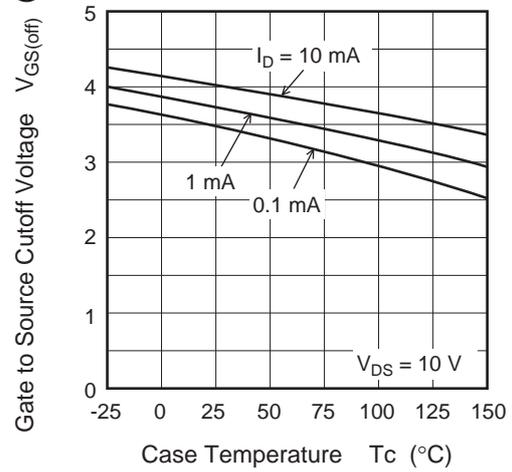
Dynamic Input Characteristics (Typical)



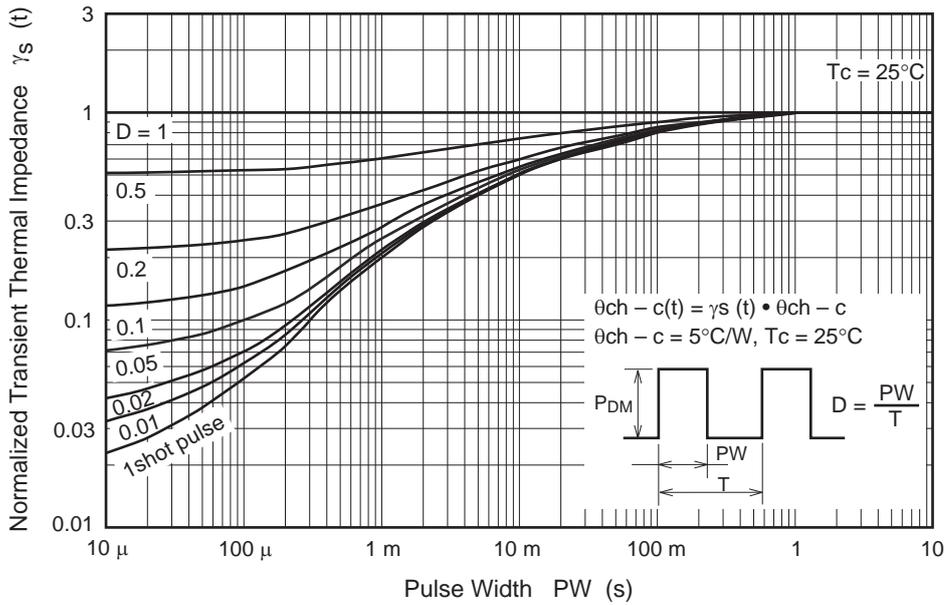
Reverse Drain Current vs. Source to Drain Voltage (Typical)



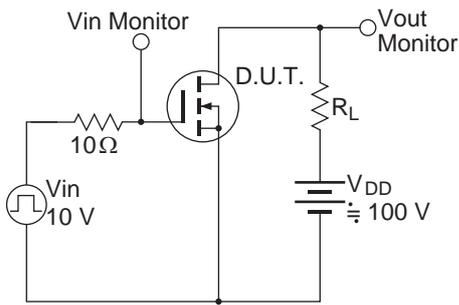
Gate to Source Cutoff Voltage vs. Case Temperature (Typical)



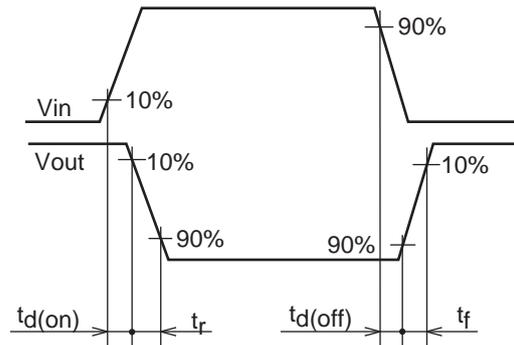
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

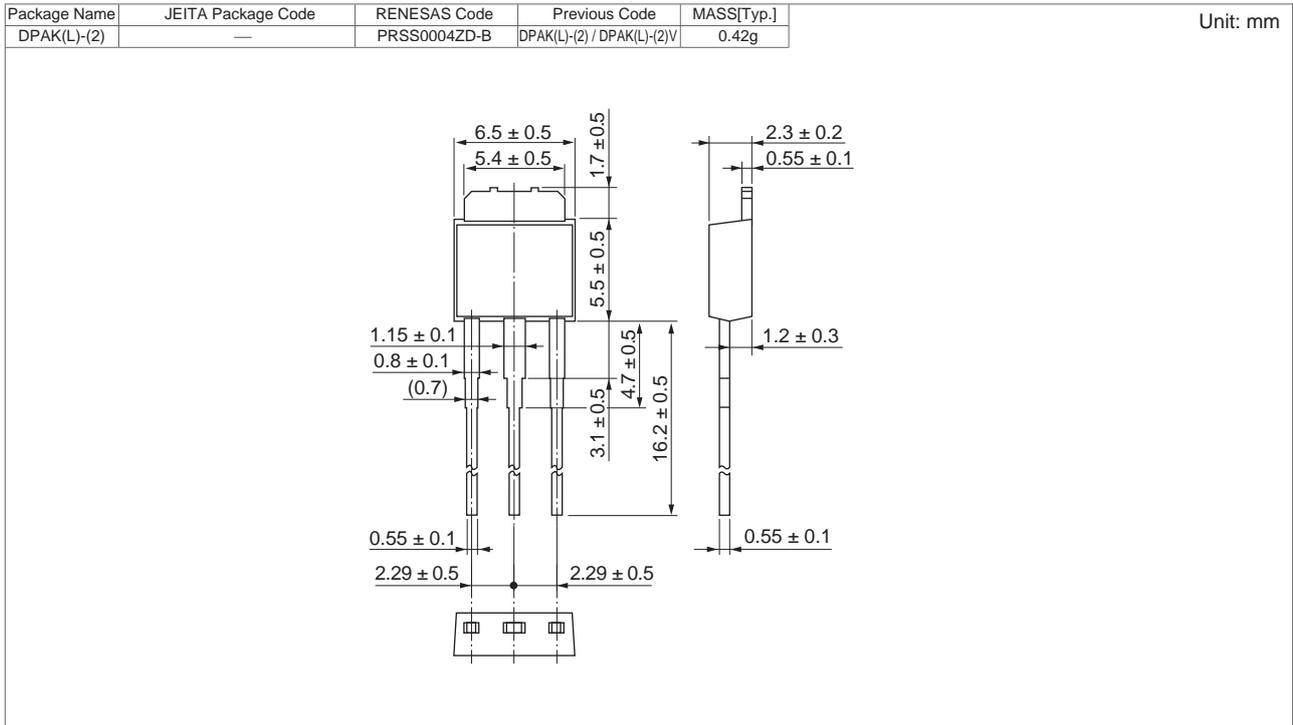


Waveform

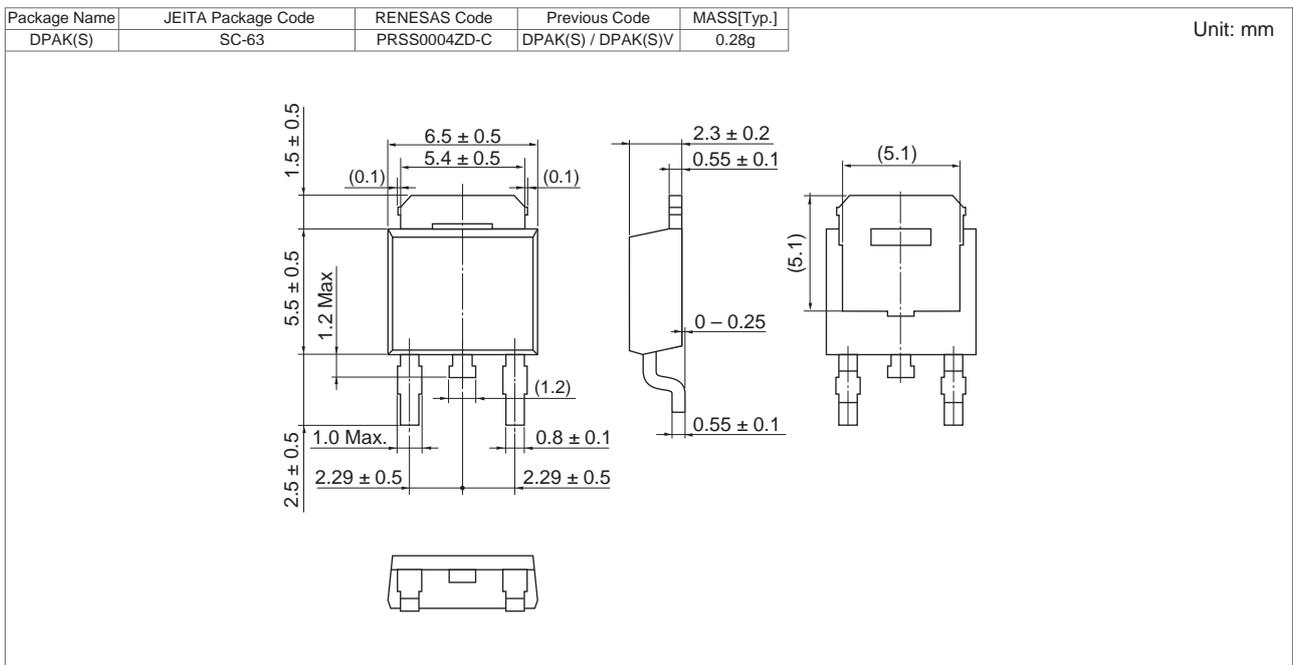


## Package Dimensions

### • H5N2005DL



### • H5N2005DS



## Ordering Information

Orderable Part Number	Quantity	Shipping Container
H5N2005DL-E	2160 pcs	Box (Tube)
H5N2005DSTL-E	3000 pcs	Taping

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