

RJF0611DPE

Silicon N Channel MOS FET Series Power Switching

R07DS0717EJ0100 Rev.1.00 Apr 17, 2012

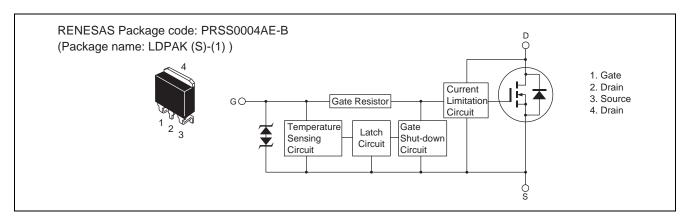
Description

This FET has the over temperature shut-down capability sensing to the junction temperature. This FET has the built-in over temperature shut-down circuit in the gate area. And this circuit operation to shut-down the gate voltage in case of high junction temperature like applying over power consumption, over current etc..

Features

- Logic level operation (4 V Gate drive).
- Built-in the over temperature shut-down circuit.
- High endurance capability against to the short circuit.
- Latch type shut down operation (need 0 voltage recovery).
- Built-in the current limitation circuit.
- Power supply voltage applies 12 V and 24 V.
- For Industrial applications

Outline



Absolute Maximum Ratings

 $(Ta = 25^{\circ}C)$

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Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	60	V
Gate to source voltage	V_{GSS}	16	V
Gate to source voltage	V_{GSS}	-2.5	V
Drain current	I _D Note3	30	А
Body-drain diode reverse drain current	I _{DR}	30	А
Avalanche current	I _{AP} Note 2	6.7	A
Avalanche energy	E _{AR} Note 2	192	mJ
Channel dissipation	Pch Note 1	50	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

Notes: 1. Value at Tc = 25°C

- 2. Tch = 25°C, Rg \geq 50 Ω
- 3. It provides by the current limitation lower bound value.

Typical Operation Characteristics

 $(Ta = 25^{\circ}C)$

Item	Symbol	Min	Тур	Max	Unit	Test Conditions
Input voltage	V _{IH}	3.5	_	_	V	
	V _{IL}	_	_	1.2	V	
Input current	I _{IH1}	_	_	100	μΑ	$Vi = 8 V, V_{DS} = 0$
(Gate non shut down)	I _{IH2}	-	_	50	μΑ	$Vi = 3.5 V, V_{DS} = 0$
	I _{IL}	-	_	1	μΑ	Vi = 1.2 V, V _{DS} = 0
Input current	I _{IH(sd)1}	1	0.8	_	mA	$Vi = 8 V, V_{DS} = 0$
(Gate shut down)	I _{IH(sd)2}	1	0.35	_	mA	$Vi = 3.5 V, V_{DS} = 0$
Shut down temperature	Tsd		175	_	°C	Channel temperature
Gate operation voltage	Vop	3.5	_	12	V	
Drain current (Current limitation value)	I _{D limt}	30	_		Α	$V_{GS} = 5 \text{ V}, V_{DS} = 10 \text{ V}^{\text{Note 4}}$

Note; 4. Pulse test

Electrical Characteristics

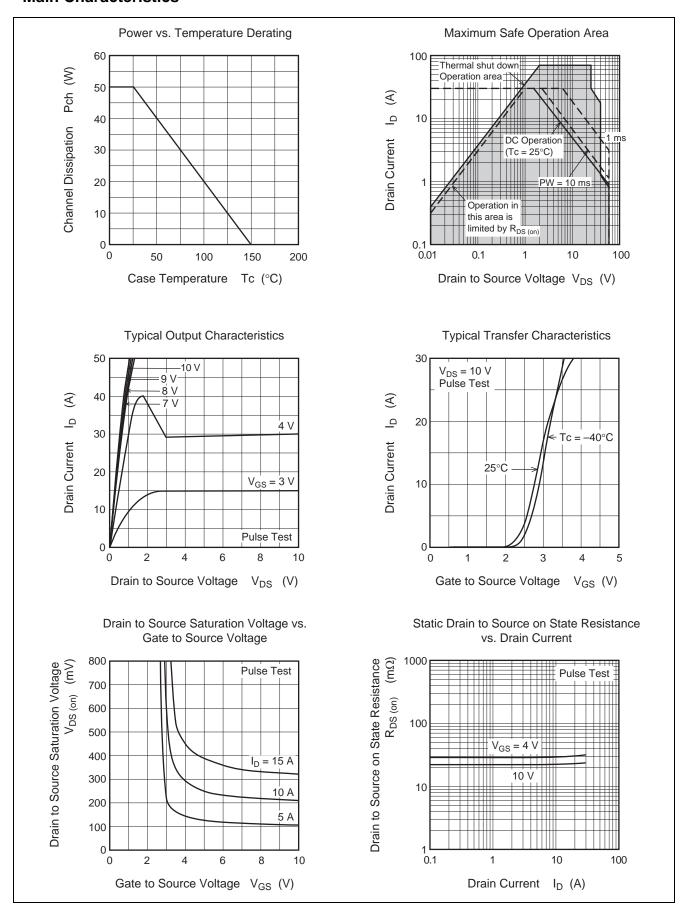
 $(Ta = 25^{\circ}C)$

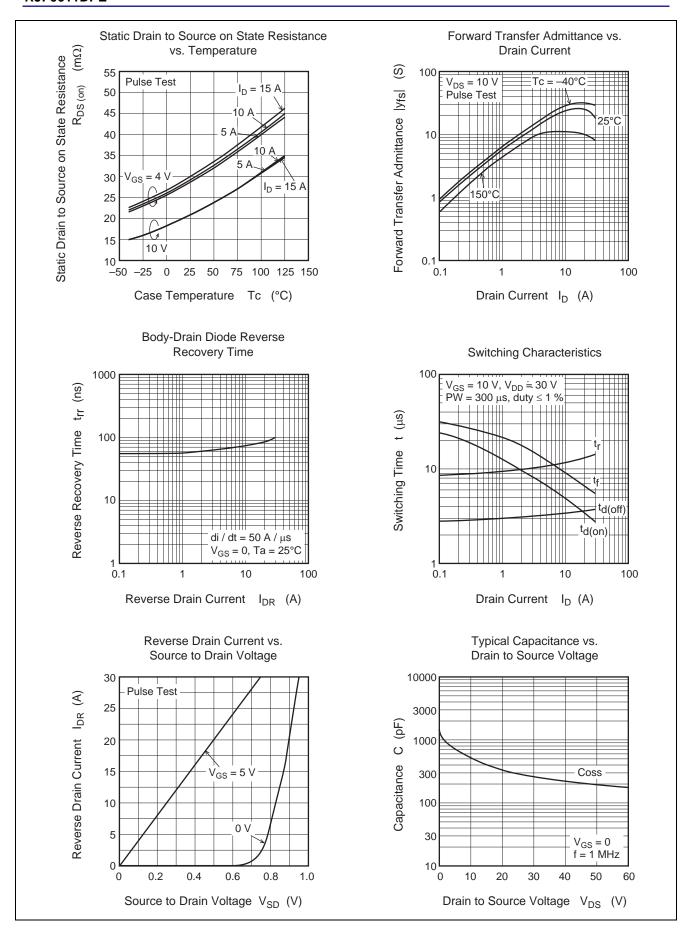
Item	Symbol	Min	Тур	Max	Unit	Test Conditions
Drain current	I _{D1}	_	_	45	Α	$V_{GS} = 3.5 \text{ V}, V_{DS} = 10 \text{ V}^{\text{Note 5}}$
	I _{D2}	_	_	10	mA	V _{GS} = 1.2 V, V _{DS} = 10 V
	I _{D3}	30	_	_	Α	$V_{GS} = 5 \text{ V}, V_{DS} = 10 \text{ V}^{\text{Note 5}}$
Drain to source breakdown voltage	V _{(BR)DSS}	60	_	_	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown	$V_{(BR)GSS}$	16	_	_	V	$I_G = 800 \ \mu A, \ V_{DS} = 0$
voltage	V _{(BR)GSS}	-2.5	_	_	V	$I_G = -100 \mu A, V_{DS} = 0$
Gate to source leak current	I _{GSS1}	_	_	100	μΑ	$V_{GS} = 8 \text{ V}, V_{DS} = 0$
	I _{GSS2}	_	_	50	μΑ	$V_{GS} = 3.5 \text{ V}, V_{DS} = 0$
	I _{GSS3}	_	_	1	μΑ	$V_{GS} = 1.2 \text{ V}, V_{DS} = 0$
	I _{GSS4}	_	_	-100	μΑ	$V_{GS} = -2.4 \text{ V}, V_{DS} = 0$
Input current (shut down)	I _{GS(OP)1}	_	0.8	_	mA	$V_{GS} = 8 \text{ V}, V_{DS} = 0$
	I _{GS(OP)2}	_	0.35	_	mA	$V_{GS} = 3.5 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	I _{DSS}	_	_	10	μΑ	$V_{DS} = 32 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	V _{GS(off)}	1.1	_	2.1	V	$V_{DS} = 10 \text{ V}, I_{D} = 1 \text{ mA}$
Forward transfer admittance	y _{fs}	12	27	_	S	$I_D = 15 \text{ A}, V_{DS} = 10 \text{ V}^{\text{Note 5}}$
Static drain to source on state	R _{DS(on)}	_	30	40	mΩ	$I_D = 15 \text{ A}, V_{GS} = 4 \text{ V}^{\text{Note 5}}$
resistance	R _{DS(on)}	_	21	30	mΩ	I _D = 15 A, V _{GS} = 10 V Note 5
Output capacitance	Coss	_	523	_	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0, f = 1 \text{MHz}$
Turn-on delay time	t _{d(on)}	_	3.8	_	μS	V_{GS} = 10 V, I_{D} = 15 A, R_{L} = 2 Ω
Rise time	t _r	_	13.5	_	μS	
Turn-off delay time	t _{d(off)}	_	4.1	_	μS	
Fall time	t _f	_	7.3	_	μS	
Body-drain diode forward voltage	V_{DF}	_	0.9	_	V	I _F = 30 A, V _{GS} = 0
Body-drain diode reverse recovery time	t _{rr}	_	110	_	ns	$I_F = 30 \text{ A}, V_{GS} = 0$ $di_F/dt = 50 \text{ A}/\mu\text{s}$
Over load shut down	t _{os1}		0.34		ms	$V_{GS} = 5 \text{ V}, V_{DD} = 16 \text{ V}$
operation time Note 6	t _{os2}		0.23	_	ms	$V_{GS} = 5 \text{ V}, V_{DD} = 24 \text{ V}$

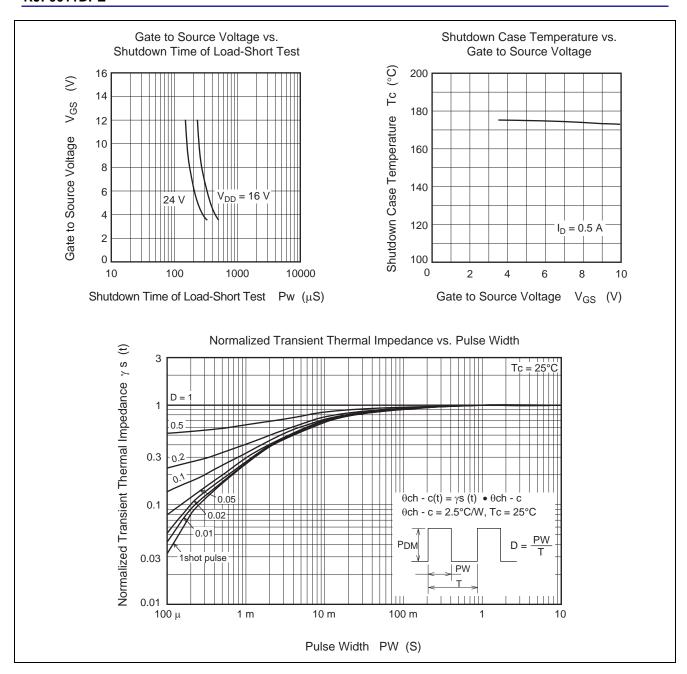
Notes: 5. Pulse test

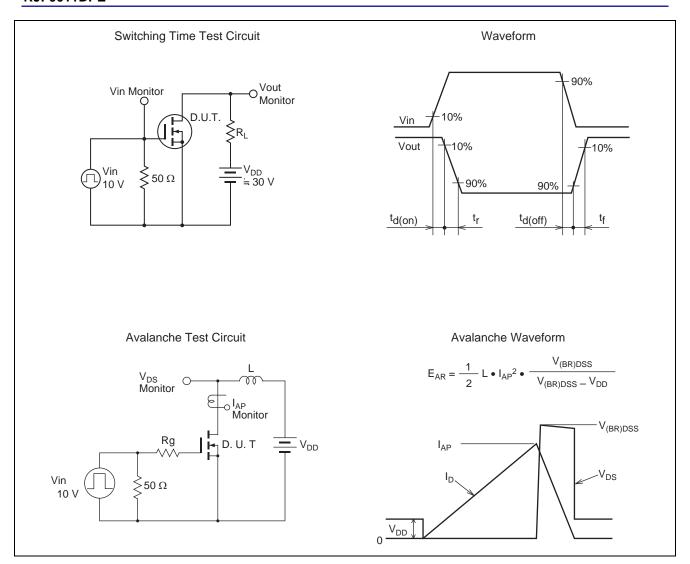
6. Including the junction temperature rise of the over loaded condition.

Main Characteristics

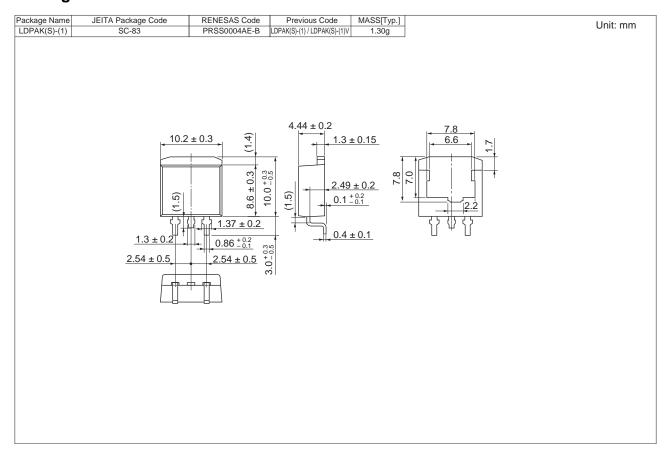








Package Dimensions



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJF0611DPE-00-J3	1000 pcs	Taping

Note: The symbol of 2nd "-" is occasionally presented as "#".

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