RJK0822SPN

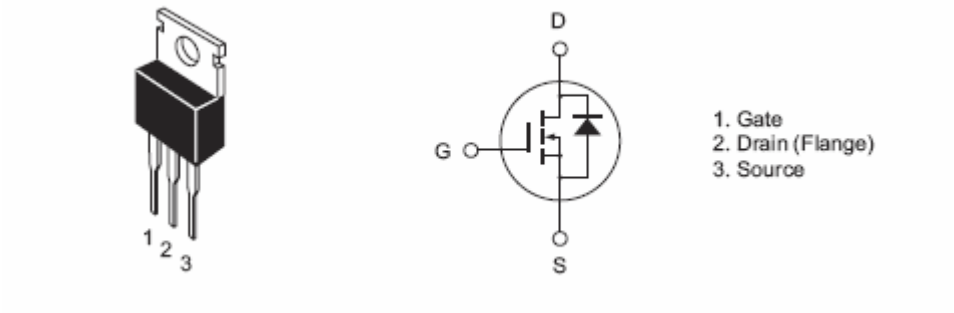
Silicon N Channel Power MOS FET
Power Switching

Rev.1.00
September.26.2007

Features

- Low on-resistance
  $R_{DS(on)}$ = 7.9mΩ typ.(at V_{GS} = 10V)
- High speed switching
- Low drive current
- Suitable for motor drive, DC-DC converter, power switch and solenoid drive

Outline



Note: This product is designed for Electric Bike (E-Bike) application in China market.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	80	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	80	A
Drain peak current	$I_{D(pulse)}$ Note1	320	A
Body-drain diode reverse drain current	I_{DR}	80	A
Channel dissipation	Pch Note2	100	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%
2. Tc = 25°C

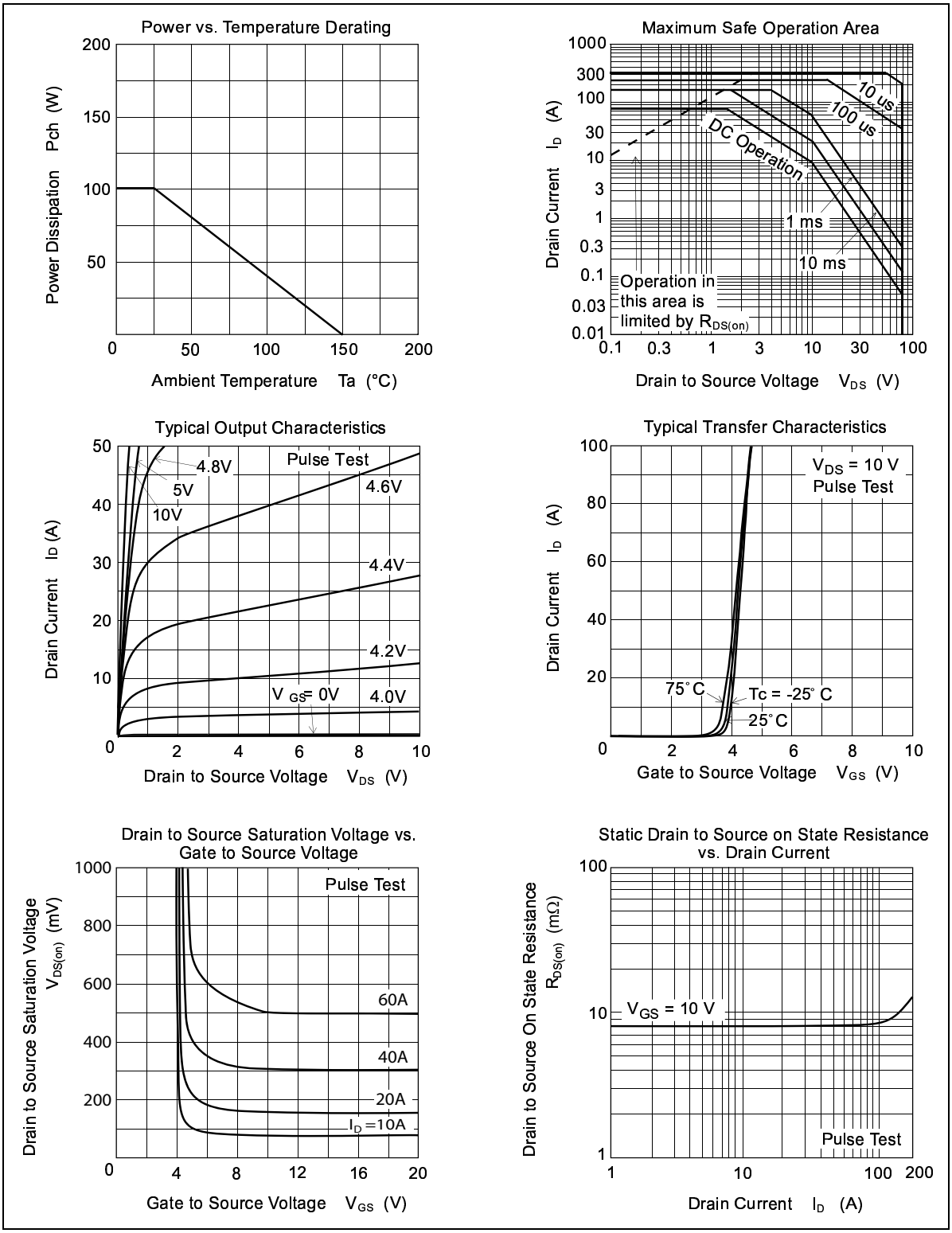
Electrical Characteristics

(Ta = 25°C)

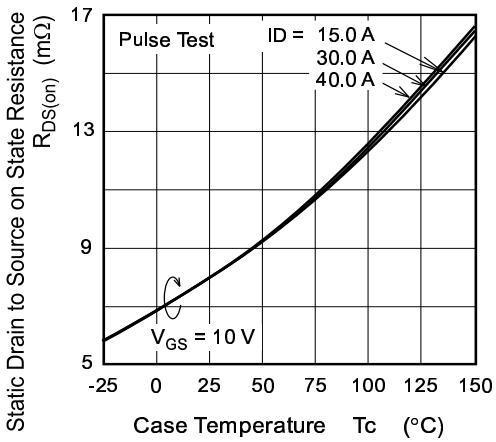
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	80	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	± 0.5	µA	V_{GS} = ±20 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	µA	V_{DS} = 80 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	2	—	4	V	V_{DS} = 10 V, I_D = 250uA
Static drain to source on state resistance	$R_{DS(on)}$	—	7.9	9.8	mΩ	I_D = 40 A, V_{GS} = 10 V [Note4]
Forward transfer admittance	$\|y_{fs}\|$	53	129	—	S	I_D = 40 A, V_{DS} = 10 V [Note4]
Input capacitance	Ciss	—	3880	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	540	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	260	—	pF	f = 1 MHz
Gate Resistance	Rg	—	1.8	—	Ω	
Total gate charge	Qg	—	63	—	nc	V_{DD} = 40 V
Gate to source charge	Qgs	—	17	—	nc	V_{GS} = 10 V
Gate to drain charge	Qgd	—	16	—	nc	I_D = 80 A
Turn-on delay time	$t_{d(on)}$	—	40	—	ns	V_{GS} = 10 V, I_D = 40 A
Rise time	t_r	—	244	—	ns	V_{DD} ≅ 40 V
Turn-off delay time	$t_{d(off)}$	—	100	—	ns	R_L = 1.0 Ω
Fall time	t_f	—	20	—	ns	Rg = 10 Ω
Body–drain diode forward voltage	V_{DF}	0.78	—	1.12	V	IF = 80 A, V_{GS} = 0 [Note4]
Body–drain diode reverse recovery time	t_{rr}	—	40	—	ns	IF = 25 A, V_{GS} = 0 diF/ dt = 100 A/ µs

Notes: 4. Pulse test

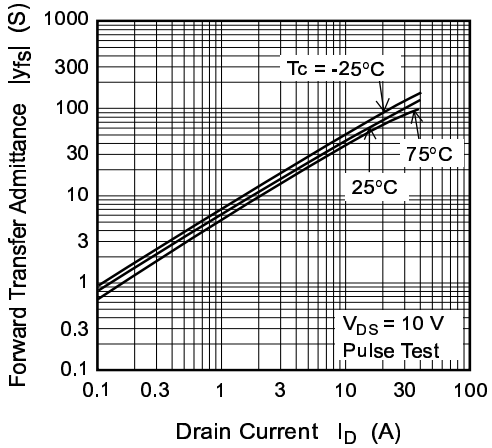
Main Characteristics



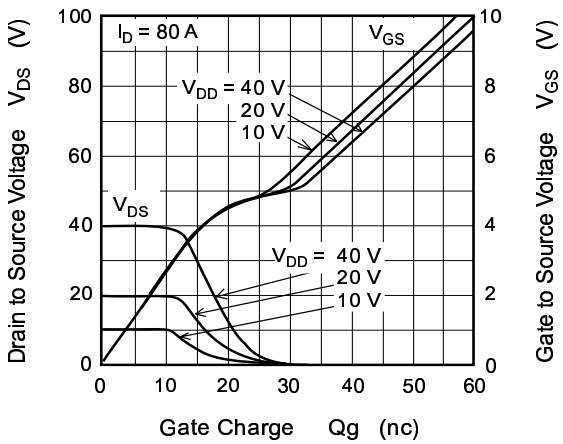
Static Drain to Source on State Resistance vs. Temperature



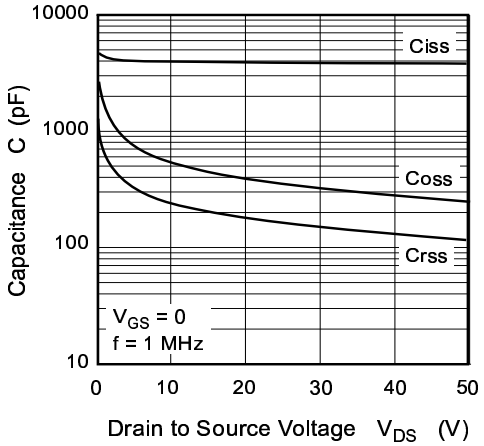
Forward Transfer Admittance vs. Drain Current



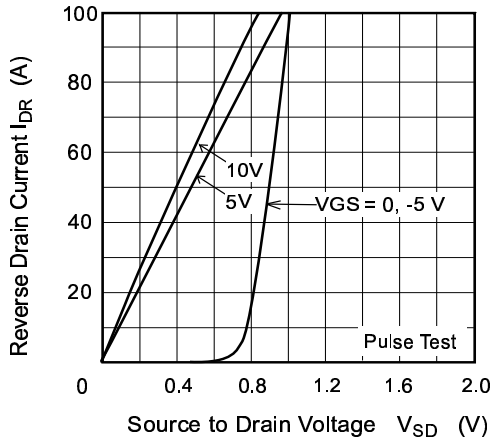
Dynamic Input Characteristics



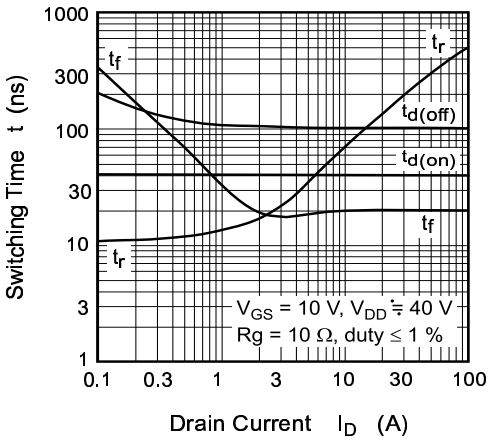
Typical Capacitance vs. Drain to Source Voltage

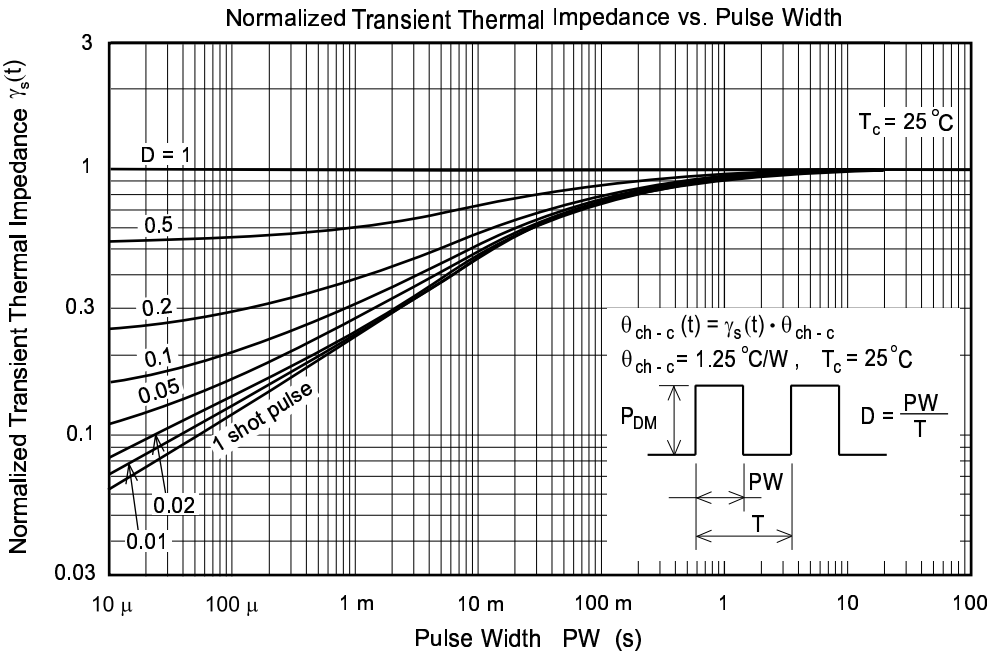


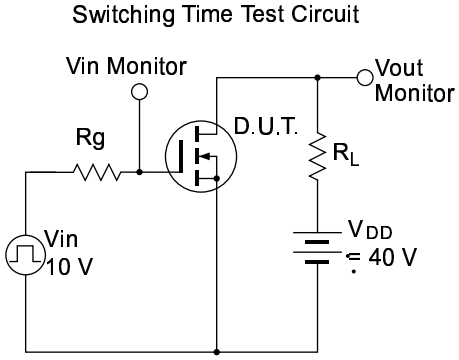
Reverse Drain Current vs. Source to Drain Voltage

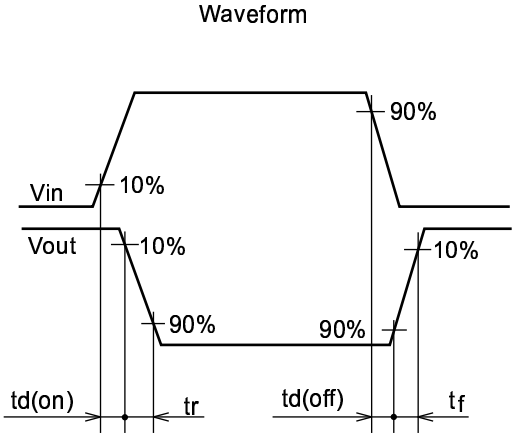


Switching Characteristics

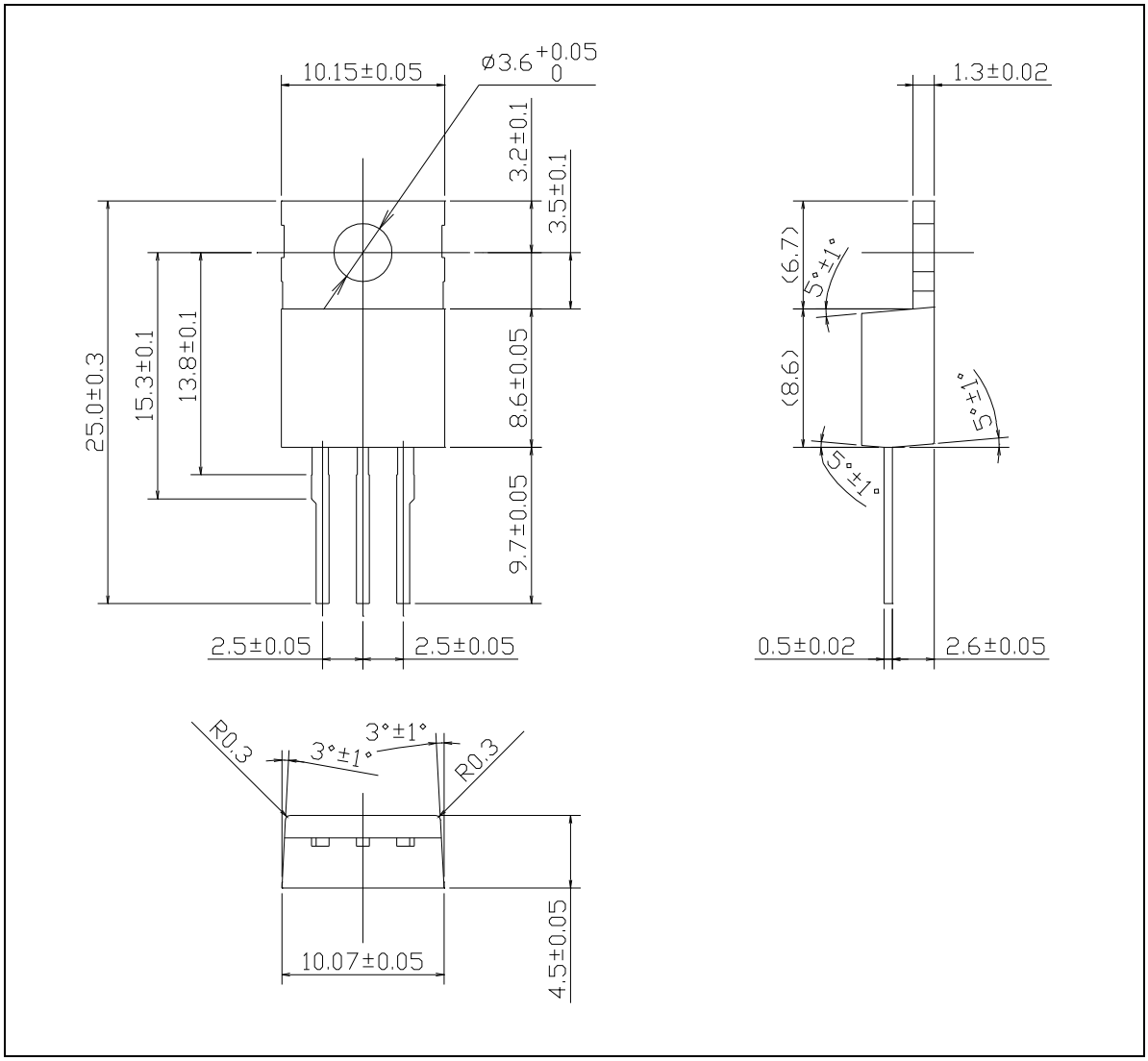



Normalized Transient Thermal Impedance vs. Pulse Width
Normalized Transient Thermal Impedance γs(t)
3
1
0.3
0.1
0.03
D = 1
0.5
0.2
0.1
0.05
0.02
0.01
1 shot pulse
Tc = 25 °C
θch - c (t) = γs (t) • θch - c
θch - c = 1.25 °C/W , Tc = 25 °C
PDM
D = PW / T
PW
T
10 μ
100 μ
1 m
10 m
100 m
1
10
100
Pulse Width PW (s)


Switching Time Test Circuit
Vin Monitor
Vout Monitor
Rg
D.U.T.
RL
VDD = 40 V
Vin 10 V


Waveform
90%
Vin
10%
Vout
10%
10%
90%
90%
td(on)
tr
td(off)
tf

Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
RJK0822SPN-00	500 pcs	Box (Sack/Tube)

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