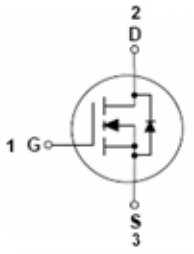
Super Junction Power MOSFET
SJ80R900D

Features

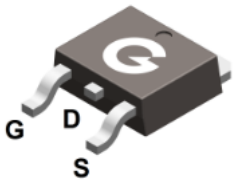
- Very low FOM $R_{DS(on)} \times Q_G$
- 100% avalanche tested
- Multi-epi SJ MOSFET
- JESD22-A114-B ESD rating of class 1A per human body model

HF



APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)



TO-252

Mechanical Data

- Case: TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
SJ80R900D	TO-252	80 pcs / Tube & 2500 pcs / Tape & Reel	SJ80R900D

Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	800	V
Drain-to-Source Voltage @ $T_{J\,(Max.)}$	V_{DSS}	850	V
Gate-to-Source Voltage	V_{GSS}	±30	V
Continuous Drain Current (T_C = 25°C)	I_D	6	A
Continuous Drain Current (T_C = 100°C)		3.6	A
Pulsed Drain Current (tp = 10μs, T_C = 25°C)	I_{DM}	18	A
Single Pulse Avalanche Energy *3	E_{AS}	62	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation(T_C = 25°C)	P_D	63	W
Thermal Resistance Junction-to-Ambient *1	$R_{\theta JA}$	25	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	2	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical Characteristics (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	800	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 800V, V_{GS} = 0V, T_J = 25°C	-	-	1	μA
		V_{DS} = 800V, V_{GS} = 0V, T_J = 150°C	-	-	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±30V, V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$R_{DS(ON)}$	Static Drain-Source On-resistance *2	V_{GS} = 10V, I_D = 3A	-	0.85	0.95	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.5	3.4	4.5	V
R_G	Gate Resistance	V_{GS} = 0V, f = 1MHz	-	13	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 100V f = 1.0MHz	-	528.6	-	pF
C_{OSS}	Output Capacitance		-	16	-	
C_{RSS}	Reverse Transfer Capacitance		-	0.31	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time *4	V_{DD} = 400V R_G = 25Ω I_D = 6A	-	41	-	ns
t_r	Turn-on Rise Time *4		-	11	-	
$t_{d(OFF)}$	Turn-Off Delay Time *4		-	75	-	
t_f	Turn-Off Fall Time *4		-	37	-	
Q_G	Total Gate-Charge	V_{DD} = 640V V_{GS} = 10V I_D = 6A	-	14.1	-	nC
Q_{GS}	Gate to Source Charge		-	3.05	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	7.06	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_{SD} = 3A, V_{GS} = 0V, T_J = 25°C	-	0.8	1.2	V
t_{rr}	Reverse Recovery Time	I_F=6A , V_R = 400 V di/dt = 100 A/μs	-	345	-	ns
Q_{rr}	Reverse Recovery Charge		-	2.5	-	μC
I_{rrm}	Peak Reverse Recovery Current		-	16.7	-	A

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
3. The E_{AS} data shows Max. rating. The test condition is V_{DD} = 50V, V_{GS} = 15V, L = 10mH
4. Guaranteed by design, not subject to production

Ratings and Characteristics Curves (@ T_J = 25°C unless otherwise specified)

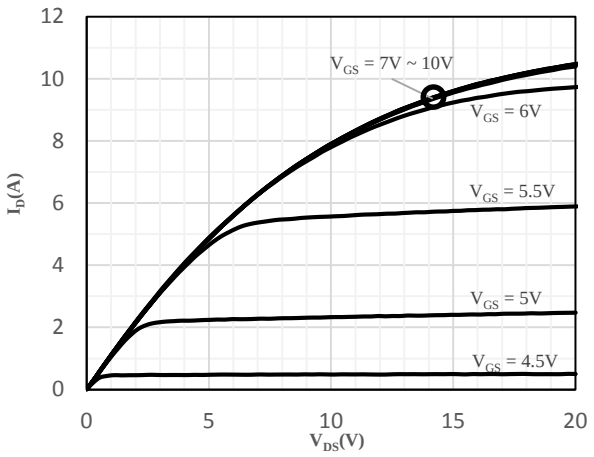


Fig 1 Typical Output Characteristics

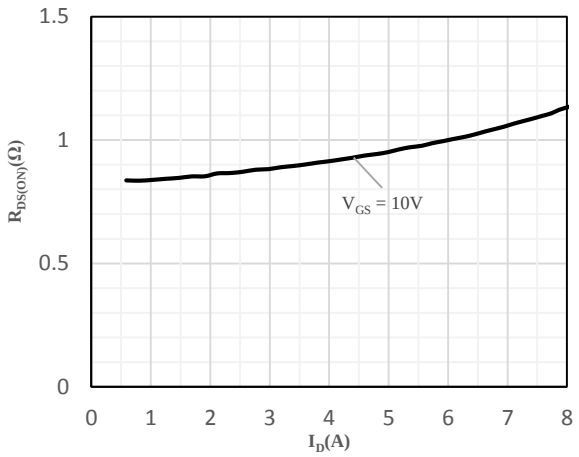


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

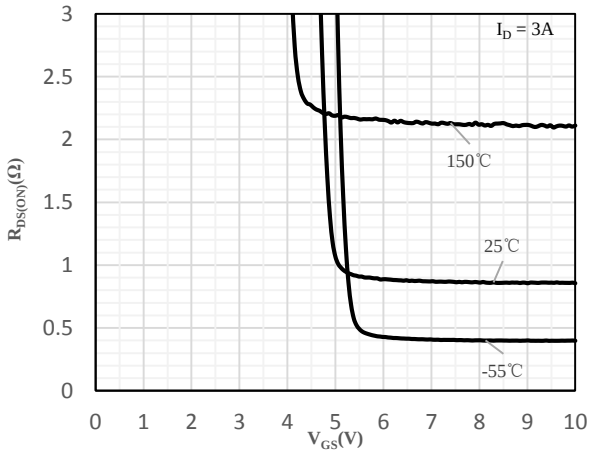


Fig 3 On-Resistance vs. Gate-Source Voltage

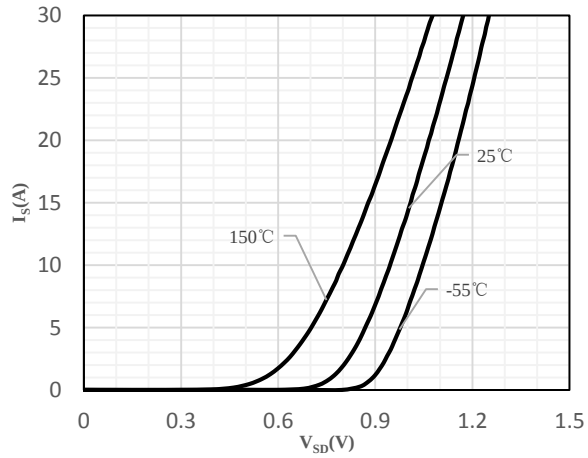


Fig 4 Body-Diode Characteristics

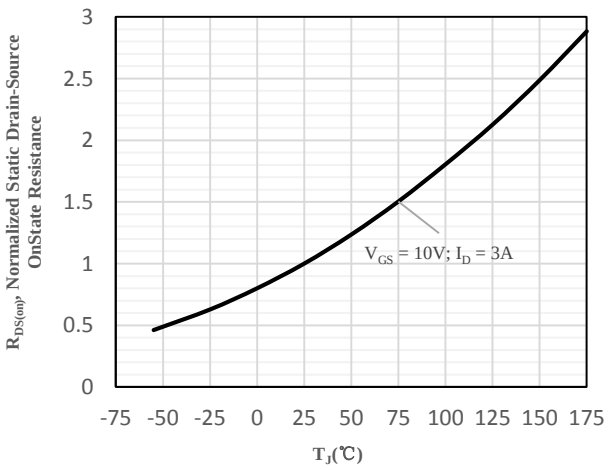


Fig 5 Normalized On-Resistance vs. Junction Temperature

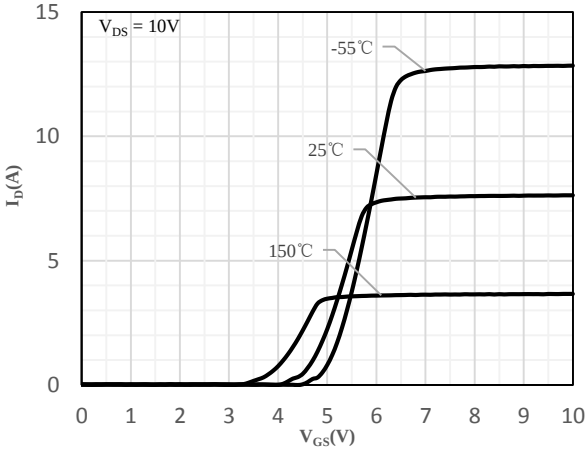


Fig 6 Transfer Characteristics

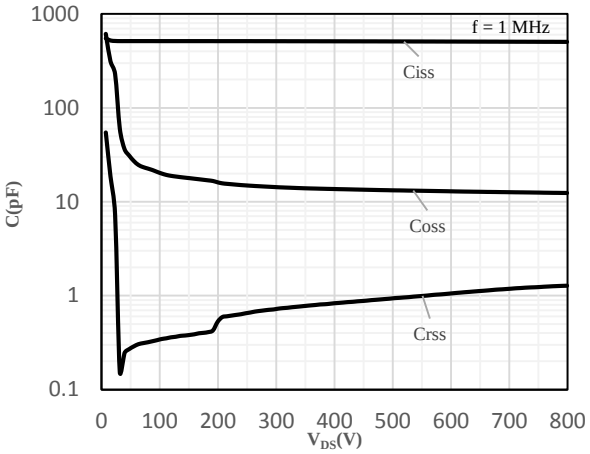


Fig 7 Capacitance Characteristics

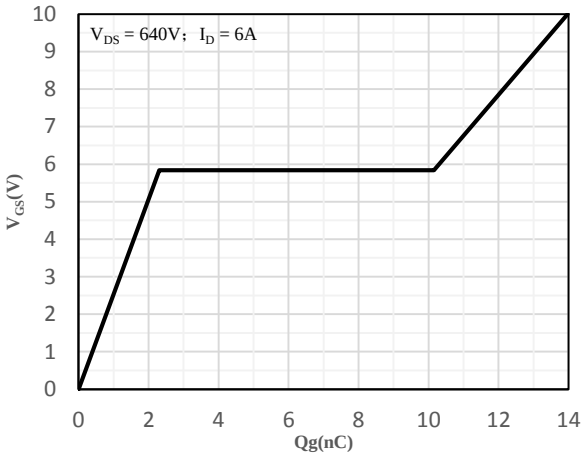


Fig 8 Gate-Charge Characteristics

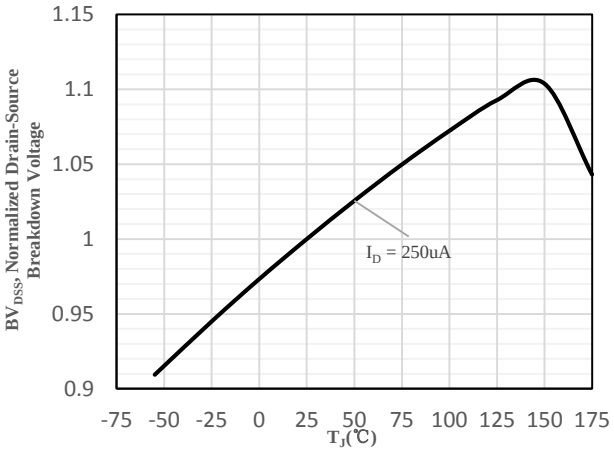


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

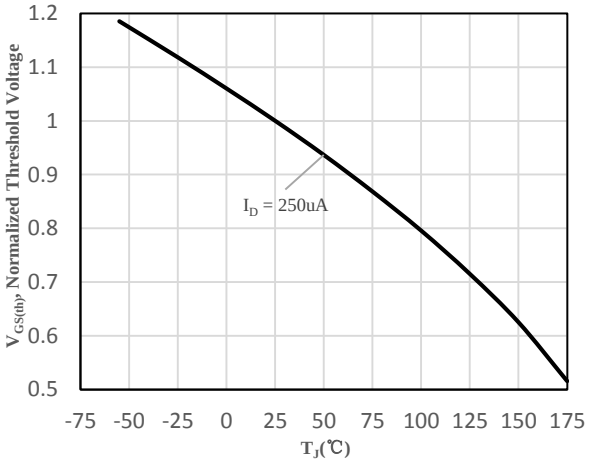


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

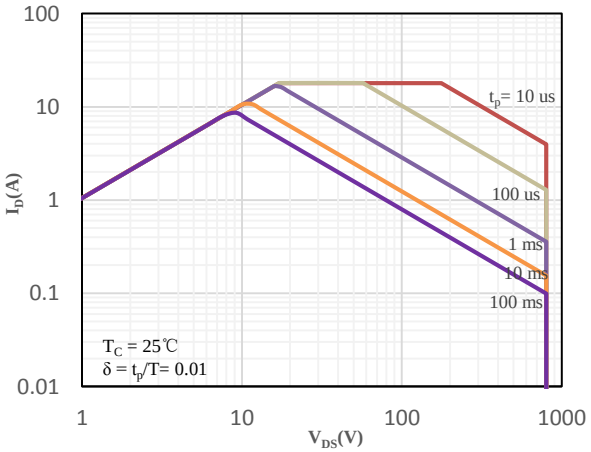


Fig 11 Safe Operation Area

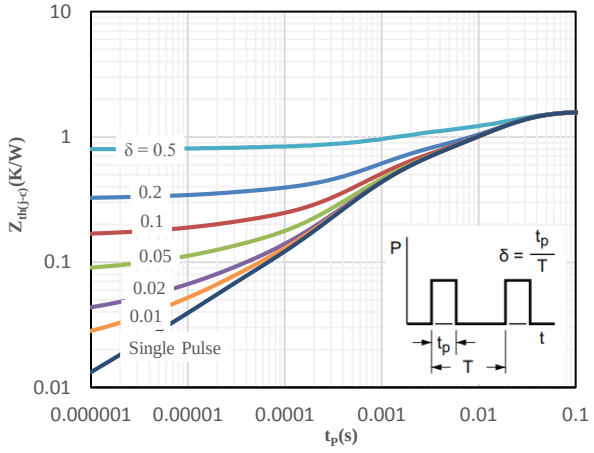
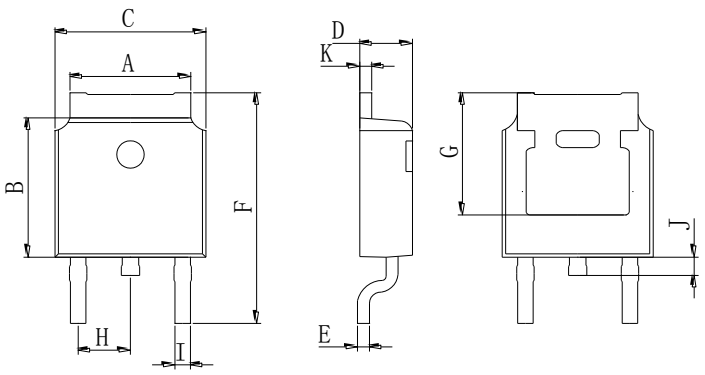


Fig 12 Maximum transient thermal impedance

Package Outline Dimensions (Unit: mm)



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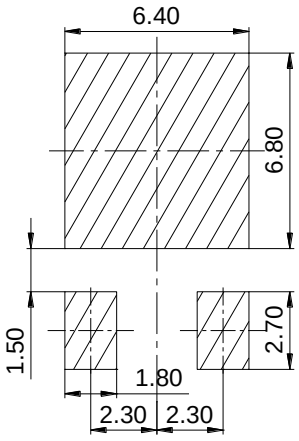
Dimension	**Min.**	**Max.**
A	5.05	5.65
B	5.80	6.40
C	6.25	6.85
D	2.20	2.40
E	0.40	0.60
F	9.71	10.31
G	5.05	5.65
H	2.10	2.50
I	0.70	0.90
J	0.50	0.70
K	0.40	0.60

Mounting Pad Layout (Unit: mm)

TO-252



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