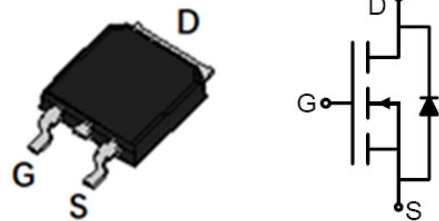


N-Channel Enhancement Mode Power MOSFET
PRIMARY CHARACTERISTICS

BV _{DSS}	R _{DS(on)} MAX	I _D
20V	8mΩ@V _{GS} =4.5V	50A
	13mΩ@V _{GS} =2.5V	

SCHEMATIC DIAGRAM
TO-252 PACKAGE

GENERAL DESCRIPTION

- Super high dense cell trench design for low RDS(on).
- Rugged and reliable.
- Ideal for Liion battery pack application

MECHANICAL DATA

- Case : Molded plastic, TO-252
- Polarity : Shown above
- Terminals : Plated terminals, solderable per MIL-STD-750, Method 2026
- Epoxy : UL94-V0 rated flame retardant

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	± 12	V
Drain Current-Continuous ^a @ T _A = 25 °C -Pulse ^b	I _D	50	A
	I _{DM}	200	A
Drain-Source Diode Forward Current ^a	I _S	50	A
Maximum Power Dissipation ^a	P _D	31	W
		24	
Operating Junction and Storage Temperature Range	T _J , T _{STG}	- 55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R _{thJA}	78	°C/W
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Note:

a. Surface Mounted on FR4 Board , t ≤ 10sec .

b. Pulse width limited by maximum junction temperature.



N-Channel Enhancement Mode Power MOSFET

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V , I _D = 250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20V , V _{GS} = 0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} = ± 12V, V _{DS} = 0V			100	nA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	0.4	0.7	1.1	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = 4.5V, I _D = 25A		6.5	8	m-ohm
		V _{GS} = 2.5V , I _D = 10A		9	13	m-ohm
Forward Transconductance	g _{fs}	V _{DS} = 15V , I _D = 12.5A		10.3		S
DRAIN-SOURCE DIODE CHARACTERISTICS ^b						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V , I _S = 1.0A			1.2	V
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	V _{DS} = 10V , V _{GS} = 0V f = 1.0MHz		1458		pF
Output Capacitance	C _{OSS}			238		pF
Reverse Transfer Capacitance	C _{RSS}			225		pF
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 15V , I _D = 1A V _{GEN} = 10V R _L = 10 ohm R _{GEN} = 3 ohm		10		ns
Rise Time	t _r			21		ns
Turn-Off Delay Time	t _{D(OFF)}			39		ns
Fall Time	t _f			19		ns
Total Gate Charge	Q _g	V _{DS} = 10V I _D = 1A V _{GS} = 10V		19		nC
Gate-Source Charge	Q _{gs}			3		nC
Gate-Drain Charge	Q _{gd}			6.4		nC

Note:

b. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

c. Guaranteed by design, not subject to production testing.



N-Channel Enhancement Mode Power MOSFET

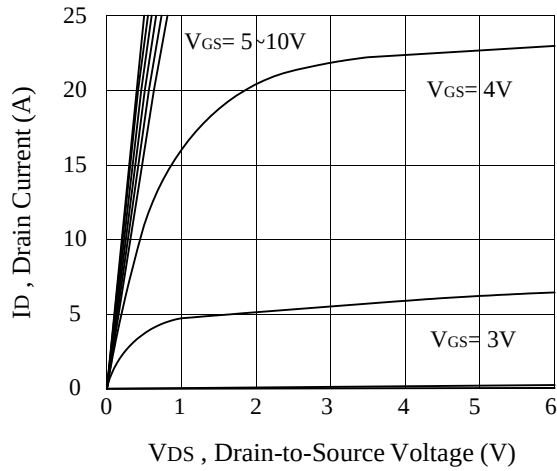


Figure 1. Output Characteristics

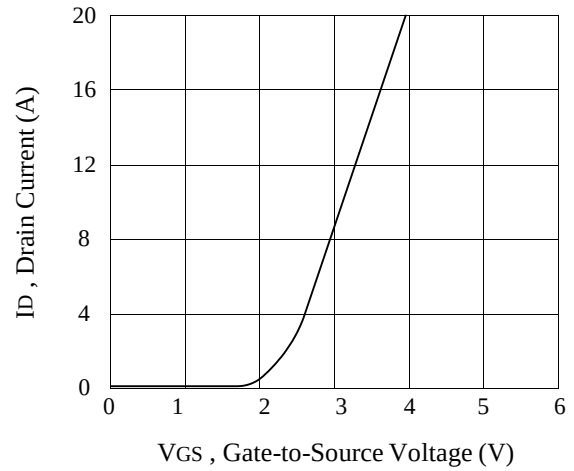


Figure 2. Transfer Characteristics

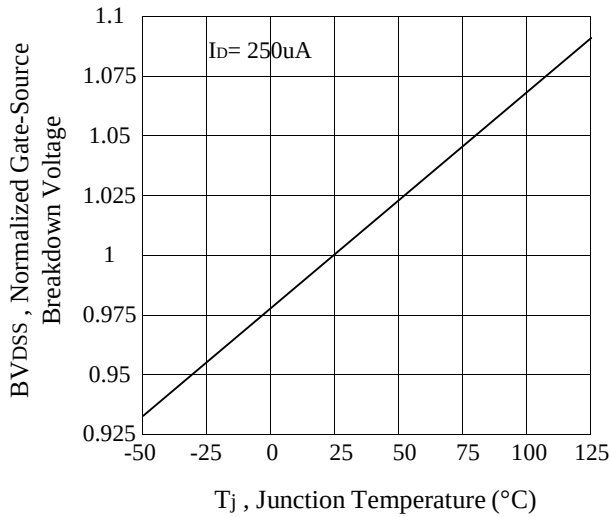


Figure 3. Breakdown Voltage Variation with Temperature

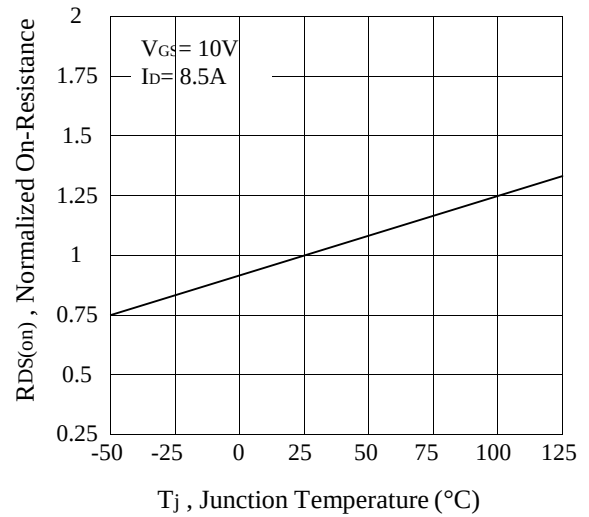


Figure 4. On-Resistance Variation with Temperature

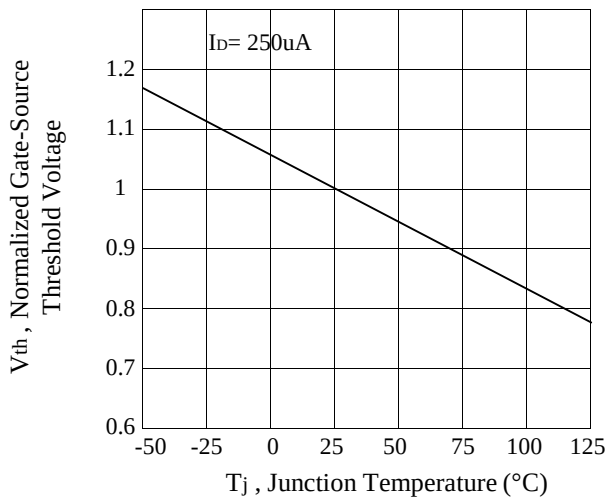


Figure 5. Gate Threshold Variation with Temperature

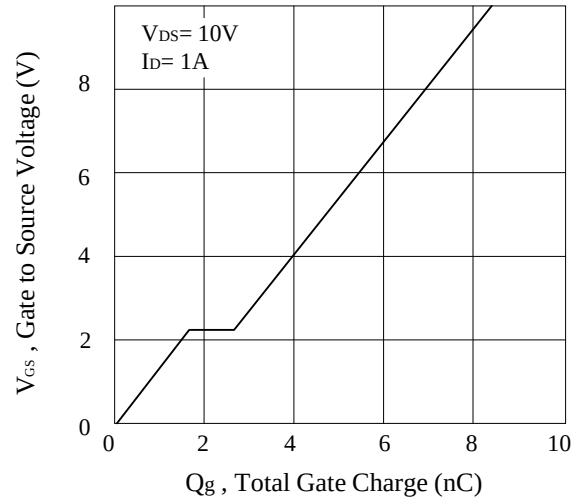
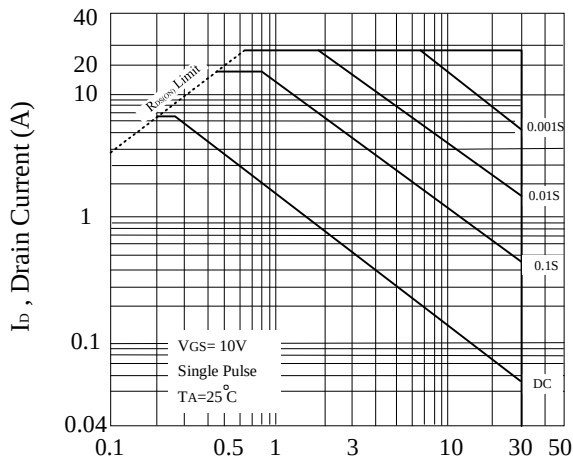


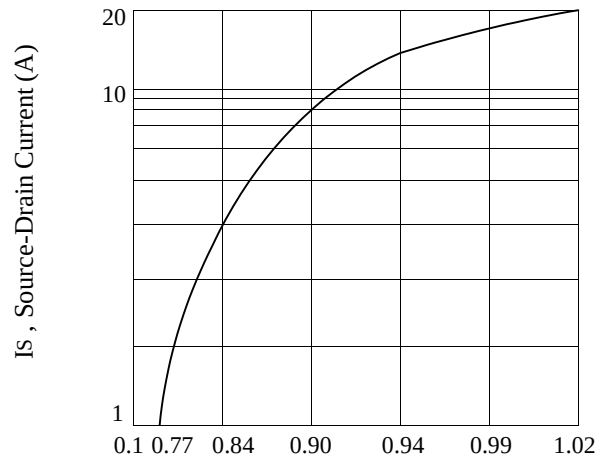
Figure 6. Gate Charge



N-Channel Enhancement Mode Power MOSFET



V_{DS} , Drain-Source Voltage (V)
Figure 7. Maximum Safe Operating Area



V_{SD} , Body Diode Forward Voltage (V)
Figure 8. Body Diode Forward Voltage Variation with Source Current

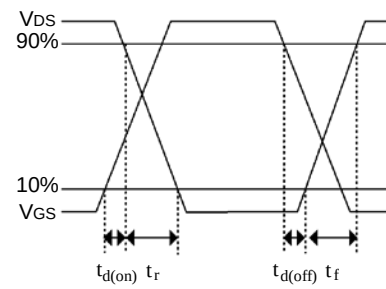
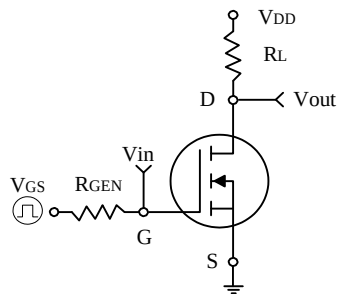


Figure 9. Switching Test Circuit and Switching Waveforms

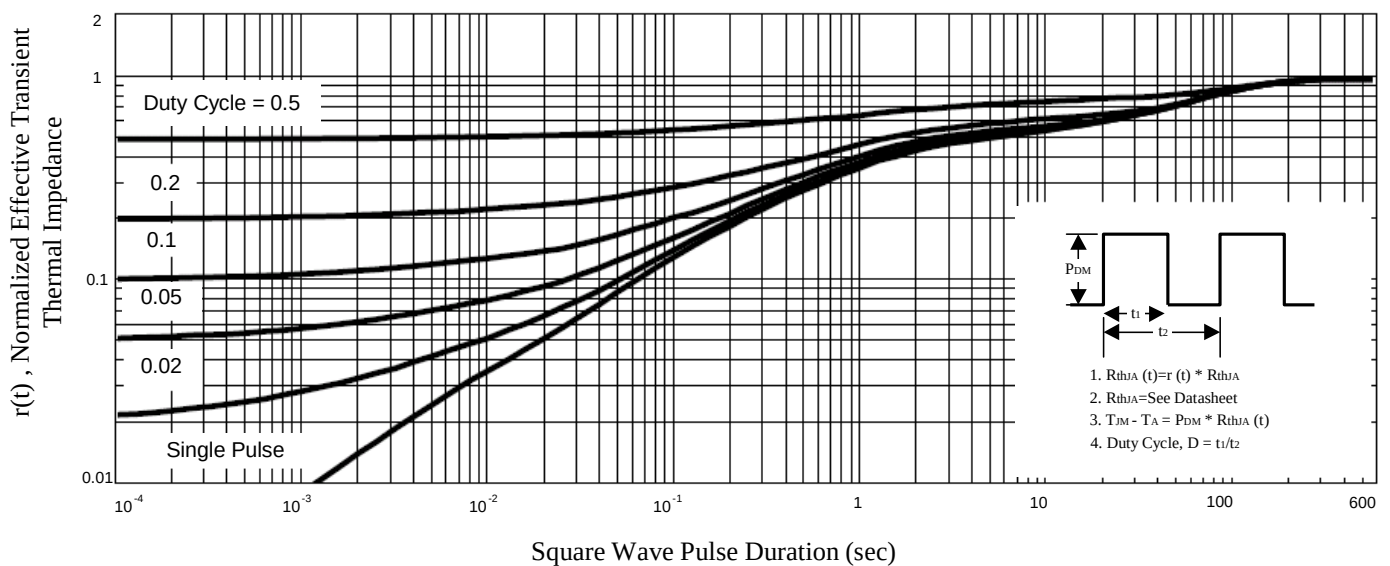


Figure 10. Normalized Thermal Transient Impedance Curve

Ordering Information:

Device PN	Packing
SJA20N50 -T ⁽¹⁾ H ⁽²⁾ -WS ⁽³⁾	Tape&Reel: 2.5 Kpcs/Reel

Note: (1) Packing code, Tape & Reel Packing

(2) Halogen free product for packing code suffix "H"

(3) WS : Willas brand abbreviation, Label Type does not display

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