

N-CHANNEL ENHANCEMENT MODE POWER MOSFET
PRIMARY CHARACTERISTICS

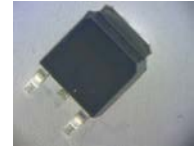
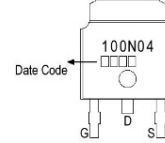
BV_{DSS}	100V
$R_{DS(ON)}$	13m Ω
I_D	68A

FEATURES

- Low On-Resistance
- Low Input Capacitance
- Green Device Available
- Low Miller Charge
- 100% EAS Guaranteed

TO-252AA
PACKAGE

Marking :



Date Code

* 4=2014, 5=2015

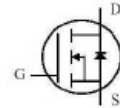
The second code : Month=A,B,C,D,.....

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	X

The third code : Production Type No. 01-99

The fourth code : Production Type No. 01-99

Ex : 4A01= 2014101 Produce


MECHANICAL DATA

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

DESCRIPTION

- The SJA100N04 uses advanced Trench technology and designs to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.
- The SJA100N04 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D @ T_C=25^\circ C$	68	A
	$I_D @ T_C=70^\circ C$	59	A
Pulsed Drain Current ¹	I_{DM}	200	A
Continuous Drain Current	$I_D @ T_A=25^\circ C$	12	A
	$I_D @ T_A=70^\circ C$	9	A
Total Power Dissipation	$P_D @ T_C=25^\circ C$	83	W
	$P_D @ T_A=25^\circ C$	2	W
Single Pulse Avalanche Energy, L=0.5mH	E_{AS}	156	mJ
Single Pulse Avalanche Current, L=0.5mH	I_{AS}	25	A
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	$^\circ C$

Thermal Data

Parameter	Symbol	Conditions	Max. Value	Unit
Thermal Resistance Junction-ambient ²	$R_{\theta JA}$	Steady State	62	$^\circ C/W$
Thermal Resistance Junction-case ²	$R_{\theta JC}$	Steady State	1.5	$^\circ C/W$

**N-CHANNEL ENHANCEMENT MODE POWER MOSFET****Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DS}	100	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	2	3	4	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 20\text{V}$
Drain-Source Leakage Current	I_{DSS}	-	-	1	μA	$V_{DS}=80\text{V}, V_{GS}=0$
Static Drain-Source On-Resistance ¹	$R_{DS(on)}$	-	10	13	m Ω	$V_{GS}=10\text{V}, I_D=30\text{A}$
Total Gate Charge ¹	Q_g	-	145	-	nC	$I_D=30\text{A}$ $V_{DS}=50\text{V}$ $V_{GS}=10\text{V}$
Gate-Source Charge	Q_{gs}	-	25	-		
Gate-Drain ("Miller") Charge	Q_{gd}	-	43	-		
Turn-on Delay Time ¹	$T_{d(on)}$	-	27	-	ns	$V_{DS}=50\text{V}$ $V_{GS}=10\text{V}$ $R_G=3\Omega$
Rise Time	T_r	-	13	-		
Turn-off Delay Time	$T_{d(off)}$	-	15	-		
Fall Time	T_f	-	42	-		
Input Capacitance	C_{iss}	-	3902	-	pF	$V_{GS}=0\text{V}$ $V_{DS}=30\text{V}$ $f=1.0\text{MHz}$
Output Capacitance	C_{oss}	-	251	-		
Reverse Transfer Capacitance	C_{rss}	-	93	-		
Gate Resistance	R_g	-	2.0	-	Ω	$f=1.0\text{MHz}$

Guaranteed Avalanche Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Single Pulse Avalanche Energy ³	EAS	60	-	-	mJ	$V_{DD}=50\text{V}, L=0.3\text{mH}, I_{AS}=20\text{A}$

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage ¹	V_{SD}	-	0.8	1.3	V	$I_S=30\text{A}, V_{GS}=0\text{V}$
Reverse Recovery Time	t_{rr}	-	65	-	ns	$I_F=30\text{A}, dI/dt=100\text{A}/\mu\text{s},$ $T_J=25^\circ\text{C}$
Reverse Recovery Charge	Q_{rr}	-	175	-	nC	

Notes: 1. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 in still air.

3. The Min. value is 100% EAS tested guarantee.



Typical Characteristics

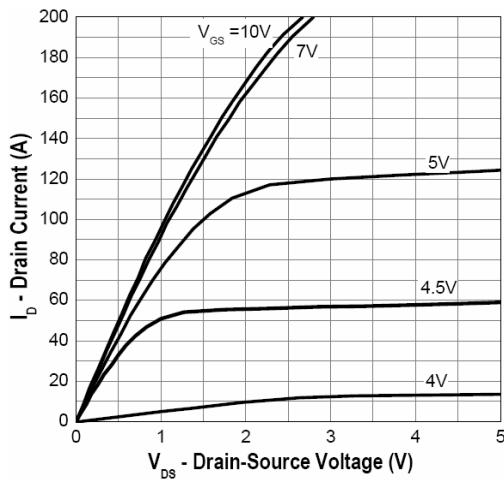


Fig.1 Typical Output Characteristics

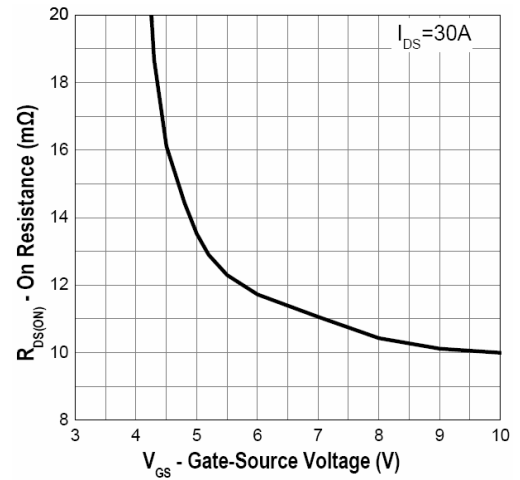


Fig.2 On-Resistance vs. G-S Voltage

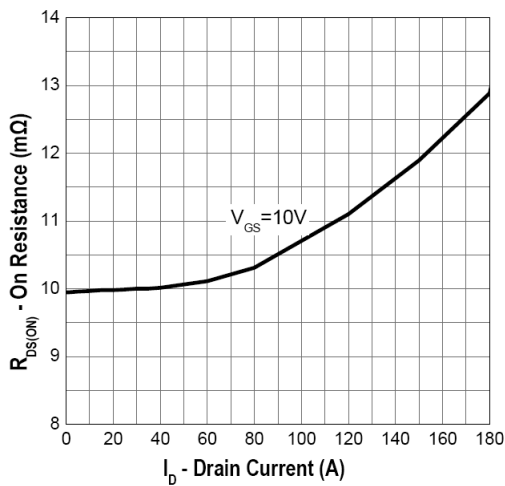


Fig.3 On-Resistance vs. Drain Current

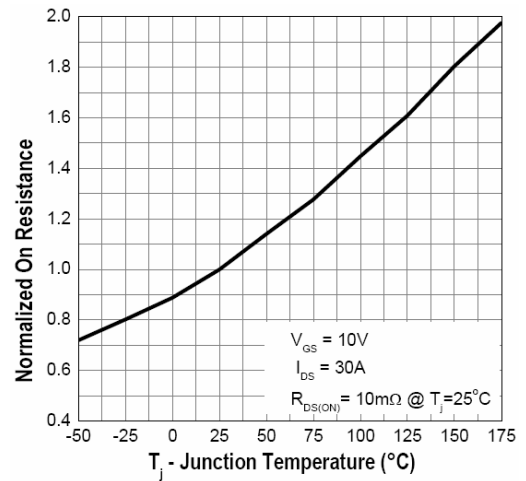


Fig.4 Normalized $R_{DS(ON)}$ vs. T_J

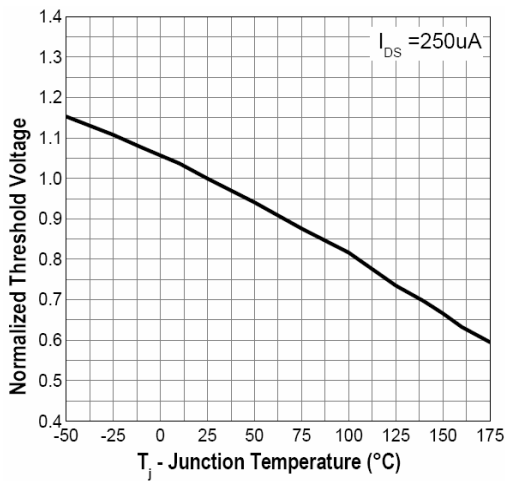


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

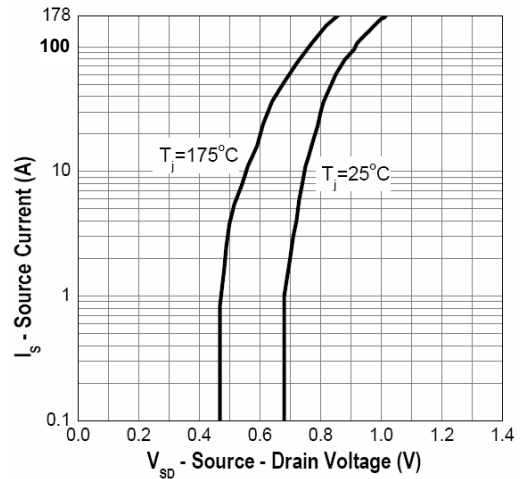
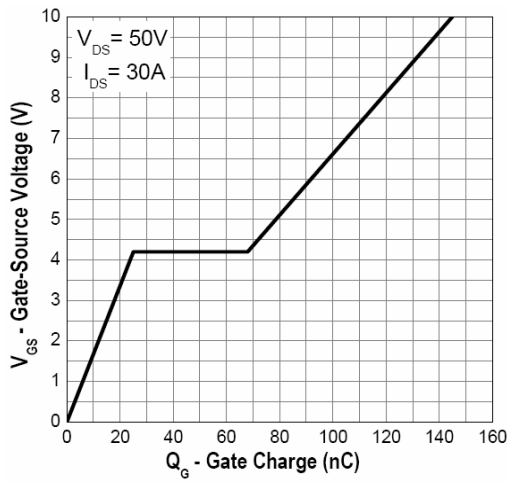
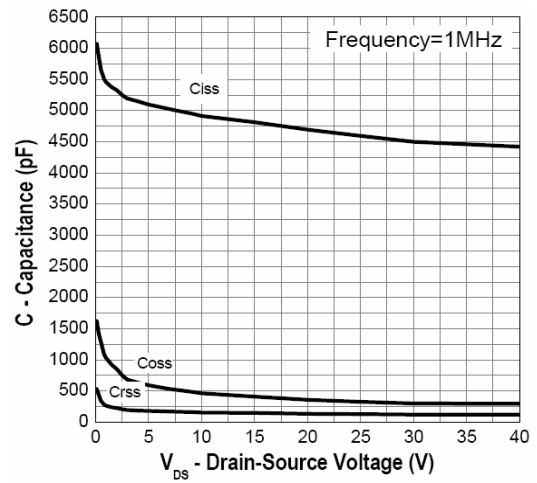
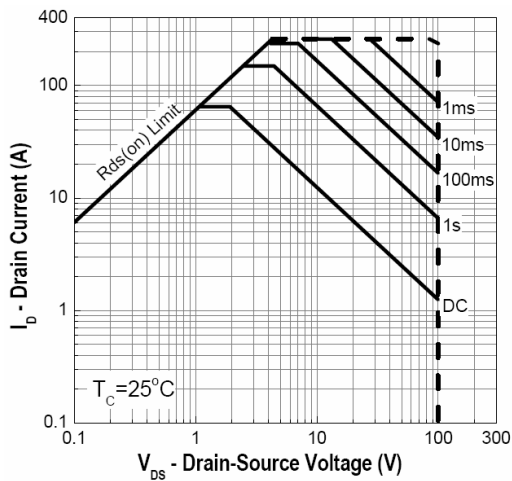
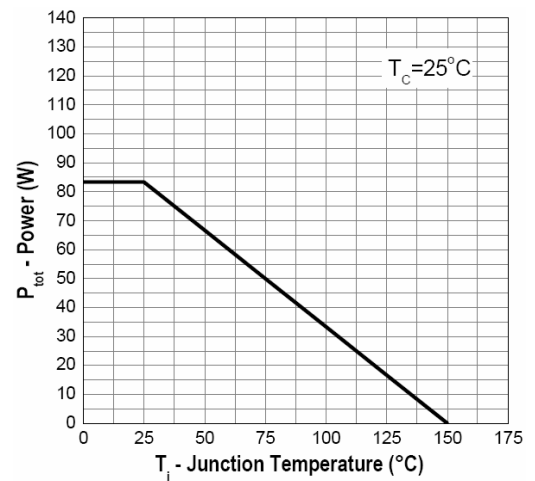
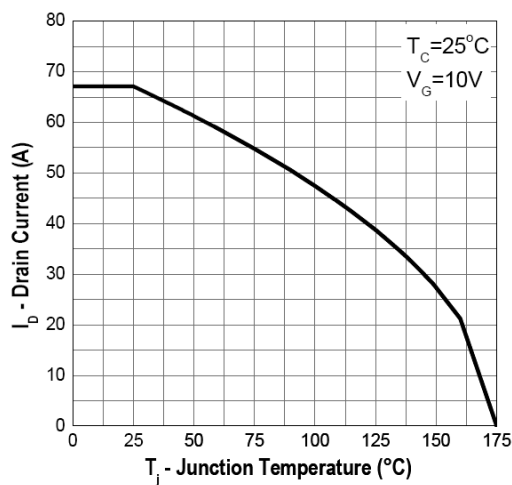
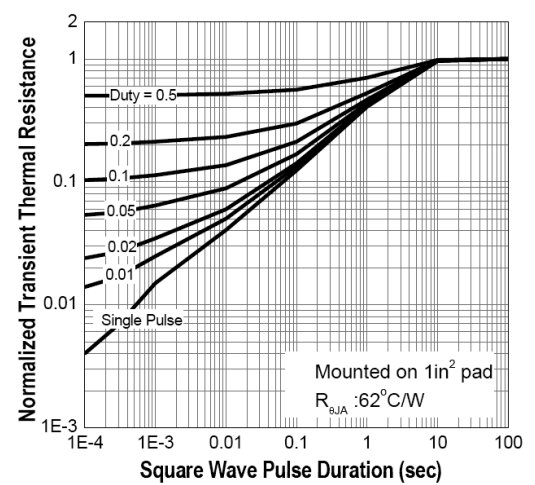


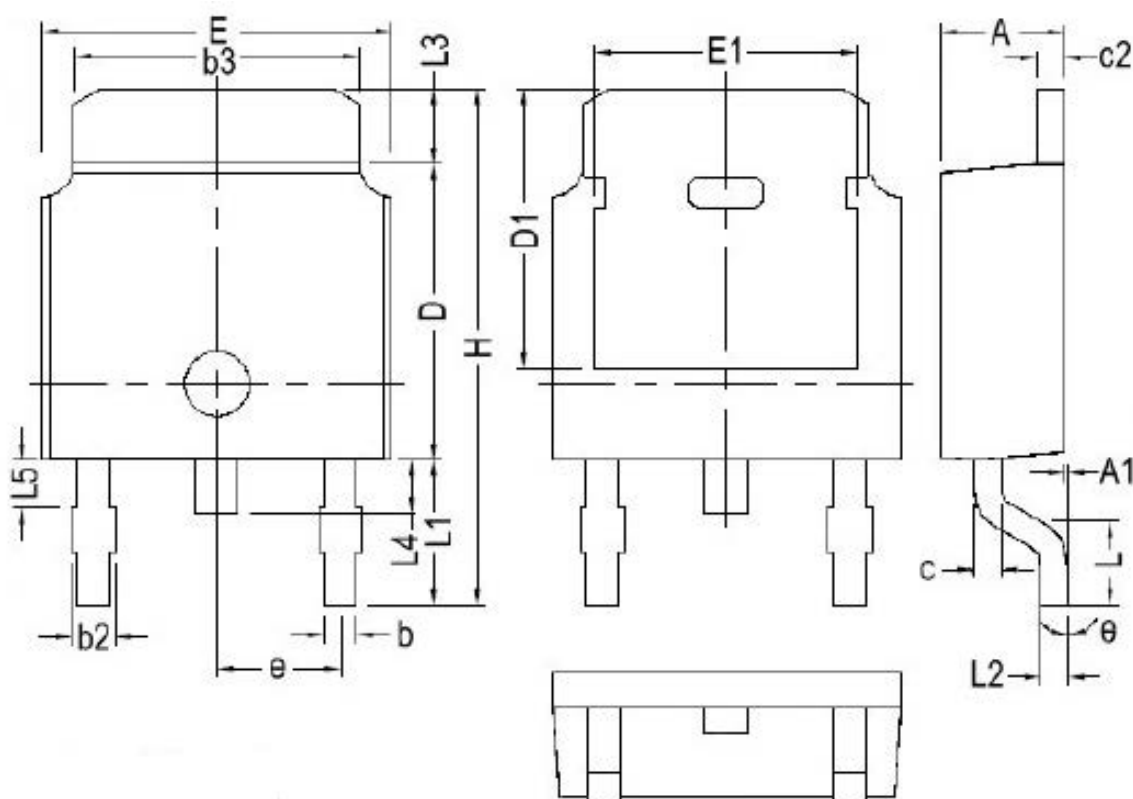
Fig.6 Forward Characteristics of Reverse

**N-CHANNEL ENHANCEMENT MODE POWER MOSFET****Fig.7 Gate Charge Characteristics****Fig.8 Capacitance Characteristics****Fig.9 Safe Operating Area****Fig.10 Power Dissipation****Fig.11 Drain Current vs. T_j** **Fig.12 Transient Thermal Impedance**



Outline Drawing

TO-252AA



REF.	Millimeter			REF.	Millimeter		
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	2.20	2.30	2.38	E1	4.40	-	-
A1	0	-	0.127	e	2.286 BSC		
b	0.64	0.76	0.88	H	9.40	10.00	10.40
b2	0.77	0.84	1.14	L	1.40	1.52	1.77
b3	5.21	5.34	5.46	L1	2.743 REF.		
c	0.45	0.50	0.60	L2	0.508 BSC		
c2	0.45	0.50	0.58	L3	0.89	-	1.27
D	6.00	6.10	6.223	L4	0.64	-	1.01
D1	5.21	-	-	L5	-	-	-
E	6.40	6.60	6.731	theta	0°	-	10°

Rev.A

**Ordering Information:**

Device PN	Packing
SJA100N04 -T ⁽¹⁾ H ⁽²⁾ -WS	Tape&Reel: 3 Kpcs/Reel

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

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

*****Disclaimer*****

WILLAS reserves the right to make changes without notice to any product specification herein, to make corrections, modifications, enhancements or other changes. WILLAS or anyone on its behalf assumes no responsibility or liability for any errors or inaccuracies. Data sheet specifications and its information contained are intended to provide a product description only. "Typical" parameters which may be included on WILLAS data sheets and/ or specifications can and do vary in different applications and actual performance may vary over time. WILLAS does not assume any liability arising out of the application or use of any product or circuit.

WILLAS products are not designed, intended or authorized for use in medical, life-saving implant or other applications intended for life-sustaining or other related applications where a failure or malfunction of component or circuitry may directly or indirectly cause injury or threaten a life without expressed written approval of WILLAS. Customers using or selling WILLAS components for use in such applications do so at their own risk and shall agree to fully indemnify WILLAS Inc and its subsidiaries harmless against all claims, damages and expenditures.