



30V P-Channel Trench Power MOSFET

General Description

The SJA3401A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as -2.5V. This device is suitable for use as a wide variety of applications.

Features

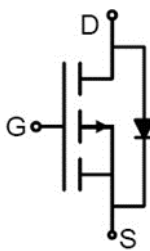
- Low Gate Charge
- High Power and current handling capability
- Lead free product is acquired

Application

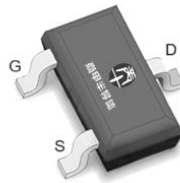
- PWM Applications
- Load Switch
- Power Management

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	-30	V
$R_{DS(ON_TYP)}$	43.8	m Ω
I_D	-4.2	A
Q_G	6.5	nC



Schematic Diagram



SOT-23-3L top view



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJA3401A	3401A	SOT-23-3L	Tape	\	\	3000 Pcs

Table 1. Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	-30	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 12	V
I_D	Drain Current-Continuous($T_A=25^\circ\text{C}$)	-4.2	A
	Drain Current-Continuous($T_A=100^\circ\text{C}$)	-2.6	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	-16.4	A
P_D	Maximum Power Dissipation($T_A=25^\circ\text{C}$)	1.2	W
	Maximum Power Dissipation($T_A=100^\circ\text{C}$)	0.5	W
E_{AS}	Avalanche energy (Note 2)	20	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ\text{C}$

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		103	$^\circ\text{C/W}$



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Table 3. Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V T _J =25℃			1	μA
		V _{DS} =-30V, V _{GS} =0V T _J =125℃			100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	-0.5		-1.3	V
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-2A		7.8		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-2A T _J =25℃		43.8	56.9	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-1.5A T _J =25℃		48.5	64.5	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V,V _{GS} =0V, f=1.0MHz		707		pF
C _{oss}	Output Capacitance			54		pF
C _{rss}	Reverse Transfer Capacitance			45		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		6.7		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-15V, R _L =7.5Ω, R _{GEN} =3Ω		10		nS
t _r	Turn-on Rise Time			80		nS
t _{d(off)}	Turn-Off Delay Time			150		nS
t _f	Turn-Off Fall Time			350		nS
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-2A		6.5		nC
Q _{gs}	Gate-Source Charge			1.4		nC
Q _{gd}	Gate-Drain Charge			1.6		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				-4.2	A
V _{SD}	Forward on Voltage (Note 3)	V _{GS} =0V, I _S =-2A			1.2	V
t _{rr}	Reverse Recovery Time	I _F =-2A, dI/dt=100A/μs		35		ns
Q _{rr}	Reverse Recovery Charge	I _F =-2A, dI/dt=100A/μs		5		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

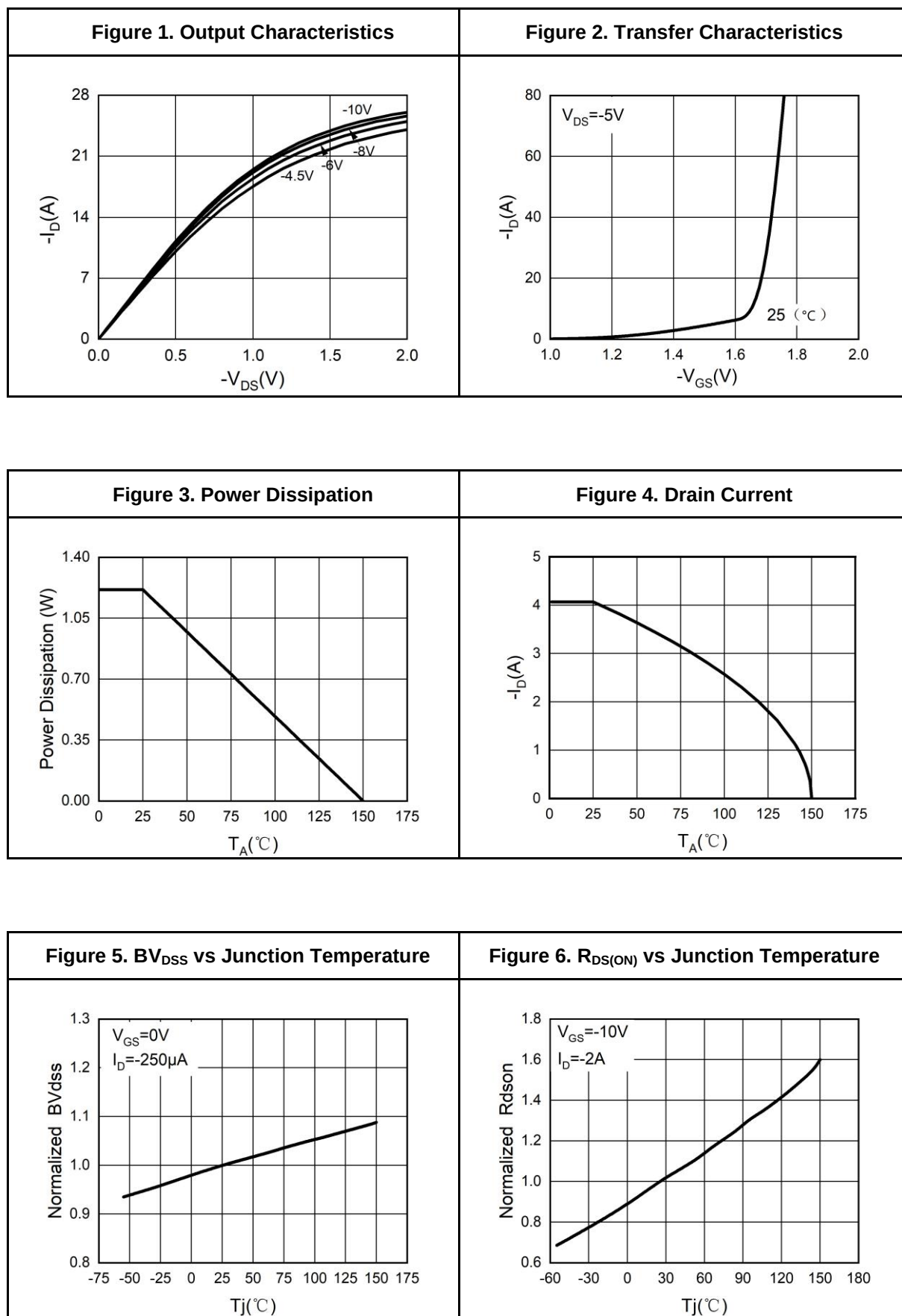
Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=-30V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.



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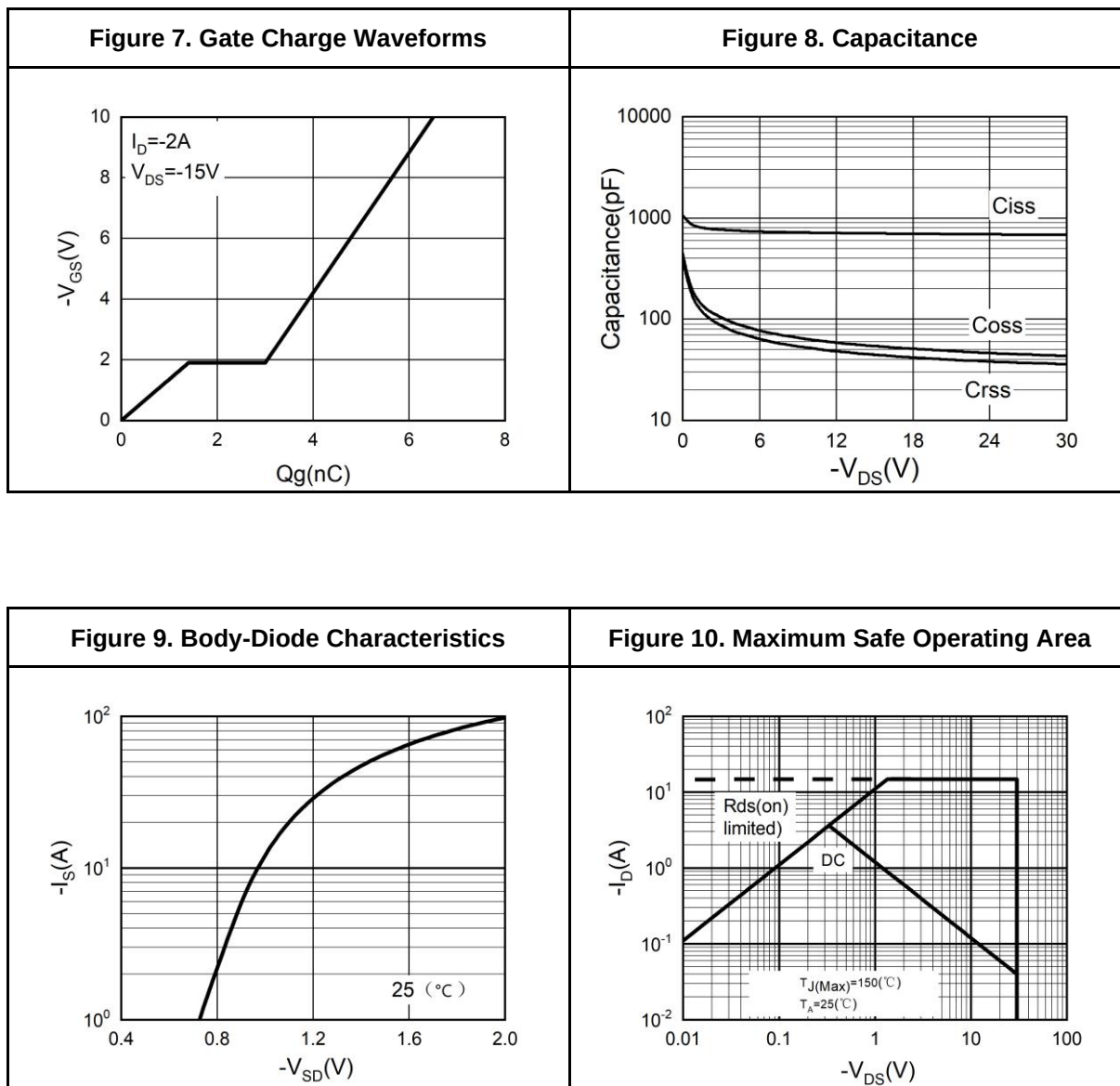
Typical Electrical And Thermal Characteristics (Curves)





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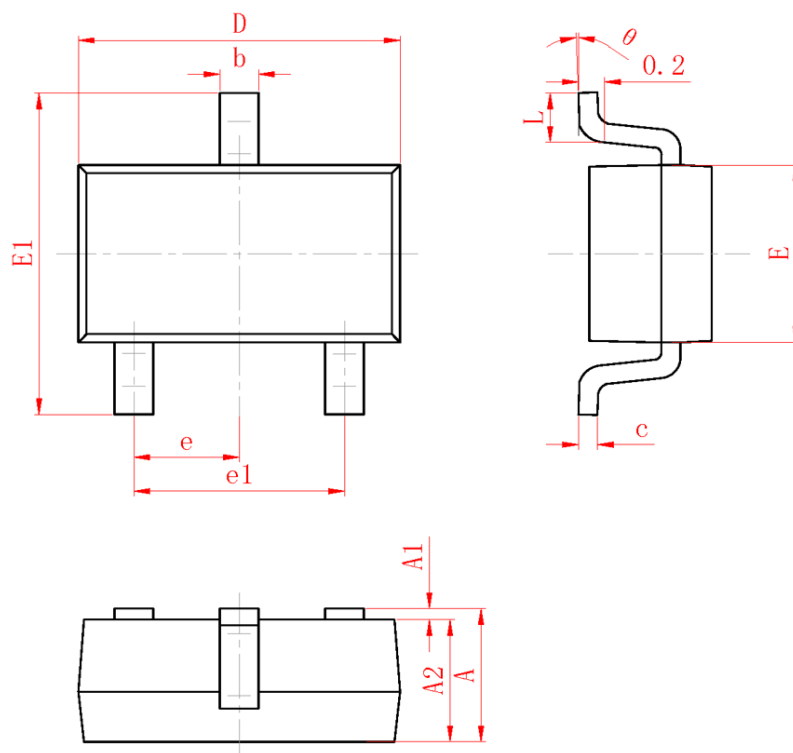
Typical Electrical And Thermal Characteristics (Curves)





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SOT-23-3L Package Information



SYMBOL	MILLIMETER	
	MIN	MAX
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.250	0.450
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950 (BSC)	
e1	1.800	2.000
L	0.300	0.500
θ	0°	8°

Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.250	0.450
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950(BSC)	
e 1	1.800	2.000
L	0.300	0.500
θ	0°	8°



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