



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 handing capability
- Lead free product is acquired

Application

- PWM Applications
- Load Switch
- Power Management

Key Performance Parametes

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



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
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		75	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		103	$^{\circ}\text{C}/\text{W}$



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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	$V_{GS}=0V, I_D=250\mu A$	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-30V, V_{GS}=0V, T_J=25^\circ\text{C}$			1	μA
		$V_{DS}=-30V, V_{GS}=0V, T_J=125^\circ\text{C}$			100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	-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	$V_{GS}=-10V, I_D=-2A, T_J=25^\circ\text{C}$		43.8	56.9	m Ω
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=-4.5V, I_D=-1.5A, T_J=25^\circ\text{C}$		48.5	64.5	m Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1.0\text{MHz}$		707		pF
C_{oss}	Output Capacitance			54		pF
C_{rss}	Reverse Transfer Capacitance			45		pF
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$		6.7		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=-10V, V_{DS}=-15V, R_L=7.5\Omega, R_{GEN}=3\Omega$		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	$I_F=-2A, dI/dt=100A/\mu s$		35		ns
Q_{rr}	Reverse Recovery Charge	$I_F=-2A, dI/dt=100A/\mu s$		5		nC

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

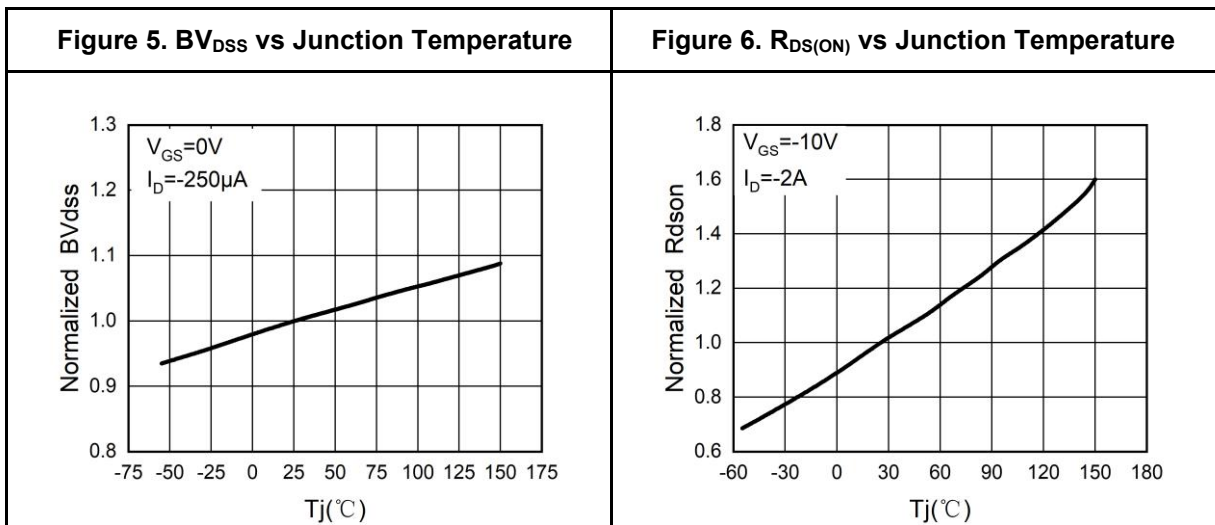
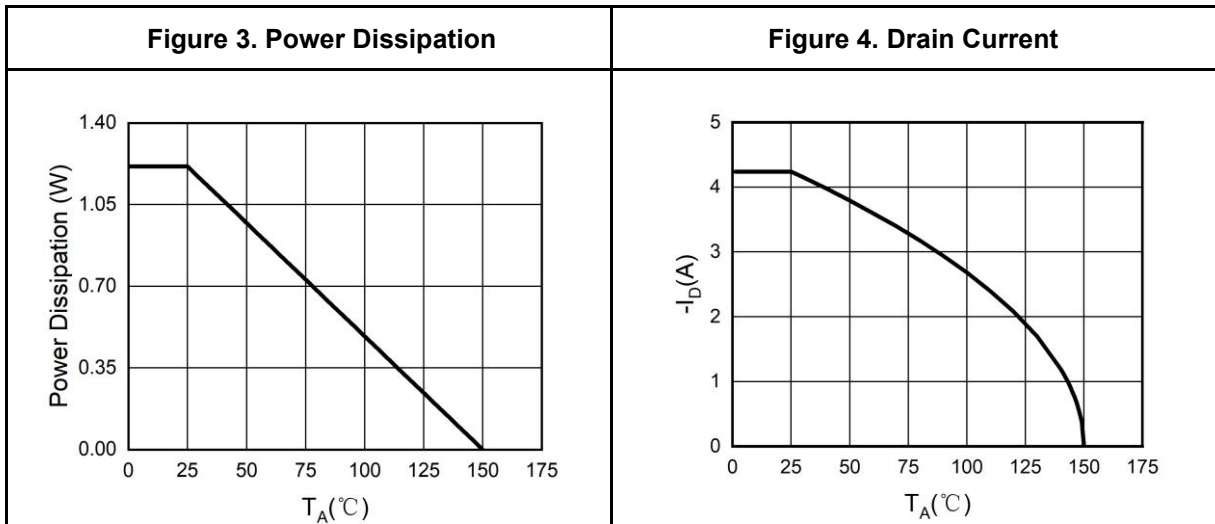
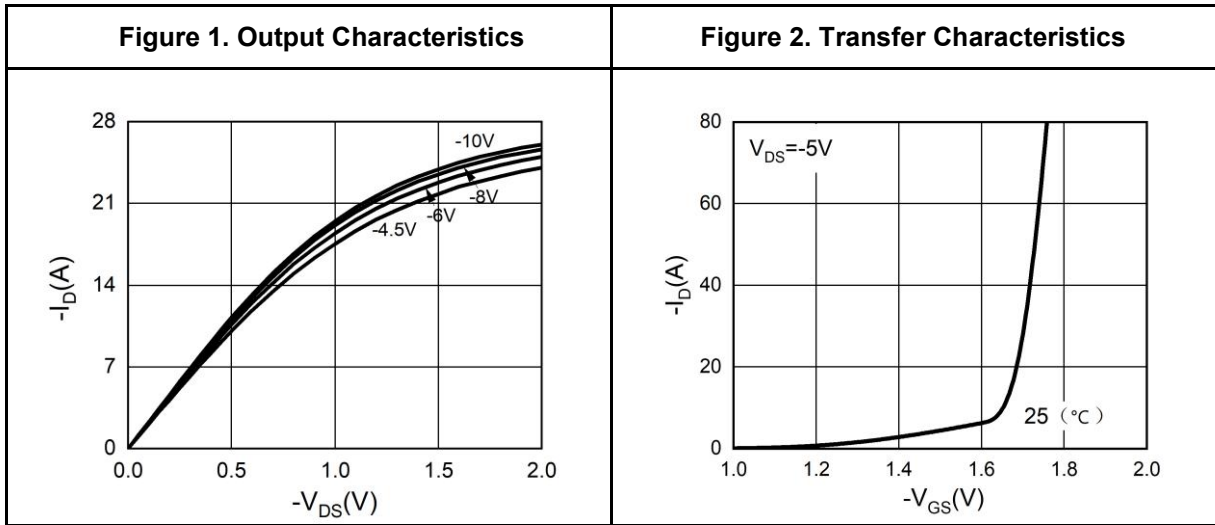
Notes 2. E_{AS} condition: $T_J=25^\circ\text{C}, V_{DD}=-30V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$.

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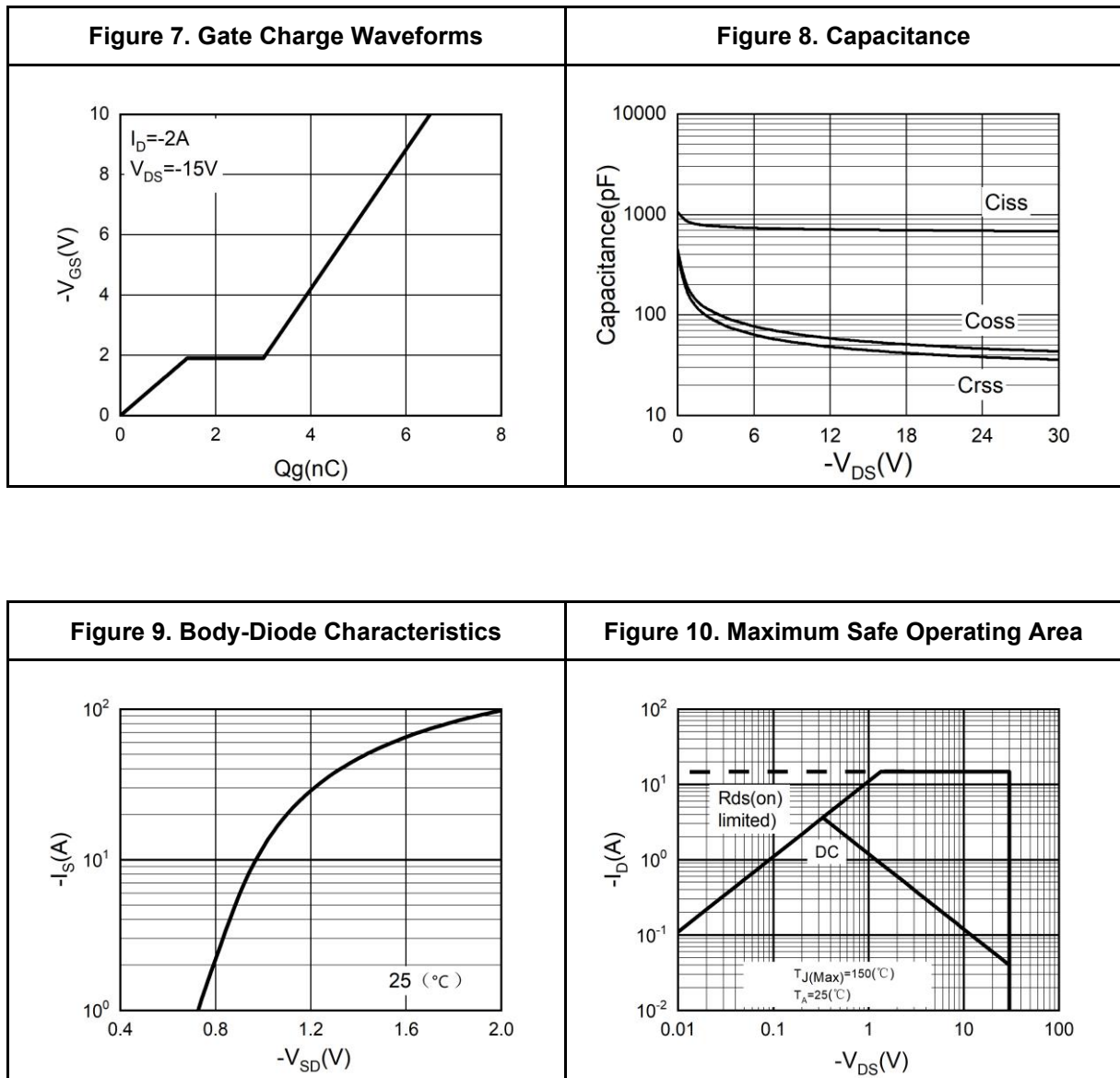
Typical Electrical And Thermal Characteristics (Curves)





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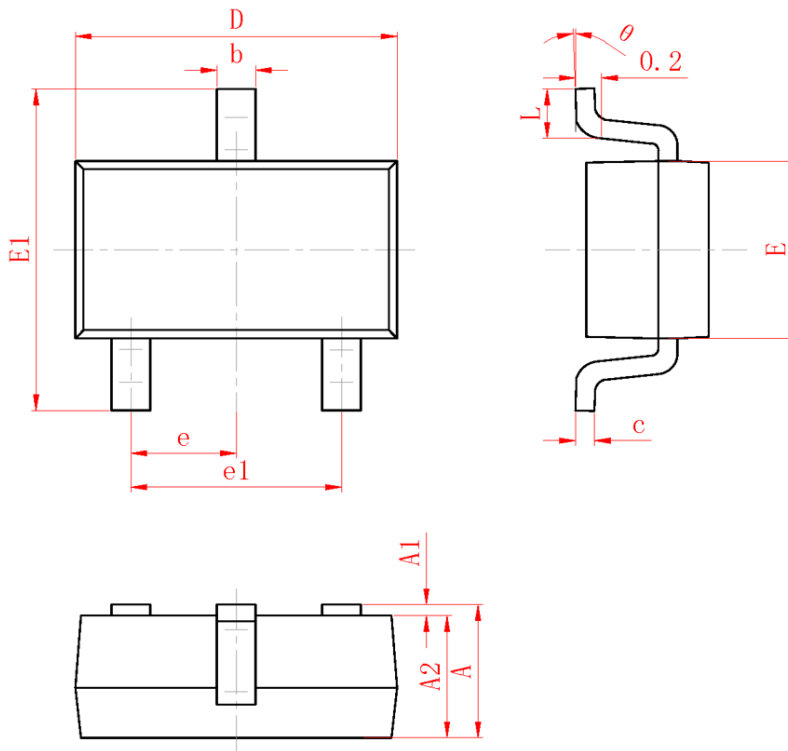
Typical Electrical And Thermal Characteristics (Curves)





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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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