



12V P-Channel Trench Power MOSFET

General Description

The SJA12P120 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

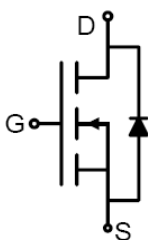
- Low Gate Charge
- High Power and current handing capability
- Lead free product is acquired

Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Key Performance Parametes

Parameter	Value	Unit
V_{DS}	-12	V
$R_{DS(ON_TYP)}$	15.3	m Ω
I_D	-8.5	A
Q_G	8	nC



Schematic Diagram



SOT-23 top view



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJA12P120	1208	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 ($V_{GS}=0\text{V}$)	-12	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0\text{V}$)	± 12	V
I_D	Drain Current-Continuous($T_A=25^{\circ}\text{C}$)	-8.5	A
	Drain Current-Continuous($T_A=100^{\circ}\text{C}$)	-5.4	A
$I_{DM}(\text{pluse})$	Drain Current-Continuous@ Current-Pulsed (Note 1)	-34	A
P_D	Maximum Power Dissipation($T_A=25^{\circ}\text{C}$)	2	W
	Maximum Power Dissipation($T_A=100^{\circ}\text{C}$)	0.8	W
E_{AS}	Avalanche energy (Note 2)	56	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		63	$^{\circ}\text{C/W}$



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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	-12			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-12V, V _{GS} =0V T _J =25℃			-1	μA
		V _{DS} =-12V, 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	-0.3		-1	V
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-5A		18.3		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-4A T _J =25℃		15.3	19.9	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-2.5V, I _D =-3A T _J =25℃		19.8	26.3	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-6V,V _{GS} =0V, f=1.0MHz		1630		pF
C _{oss}	Output Capacitance			303		pF
C _{rss}	Reverse Transfer Capacitance			280		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		7.7		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =-4.5V, V _{DS} =-6V, R _L =1.2Ω, R _{GEN} =3Ω		13		nS
t _r	Turn-on Rise Time			35		nS
t _{d(off)}	Turn-Off Delay Time			32		nS
t _f	Turn-Off Fall Time			10		nS
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-6V, I _D =-5A		8		nC
Q _{gs}	Gate-Source Charge			2		nC
Q _{gd}	Gate-Drain Charge			1.8		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				-8.5	A
V _{SD}	Forward on Voltage (Note 3)	V _{GS} =0V, I _S =-5A			-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-5A, dI/dt=100A/μs		18		ns
Q _{rr}	Reverse Recovery Charge	I _F =-5A, dI/dt=100A/μs		7		nC

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

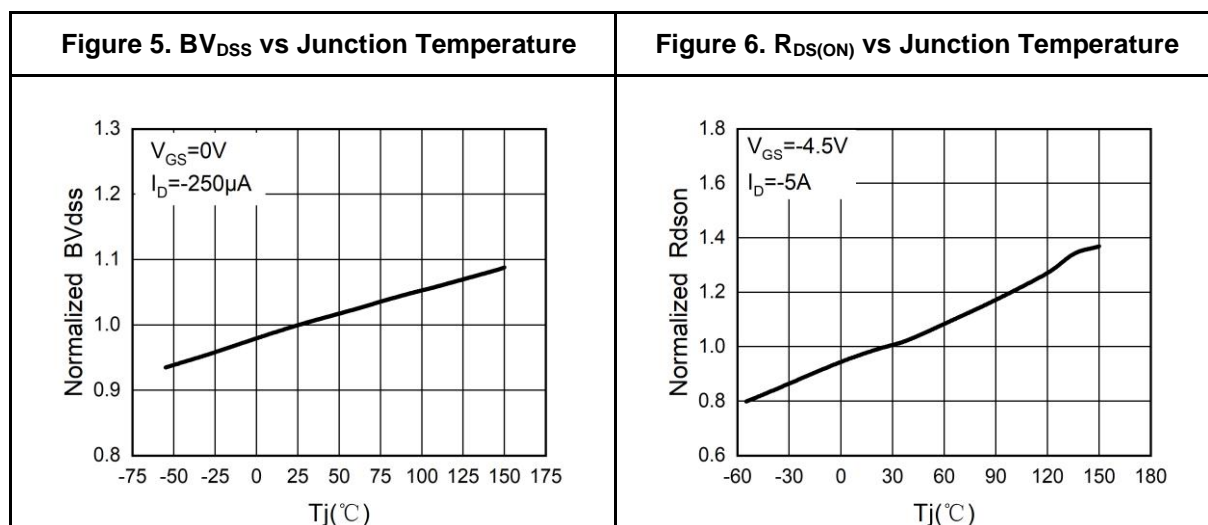
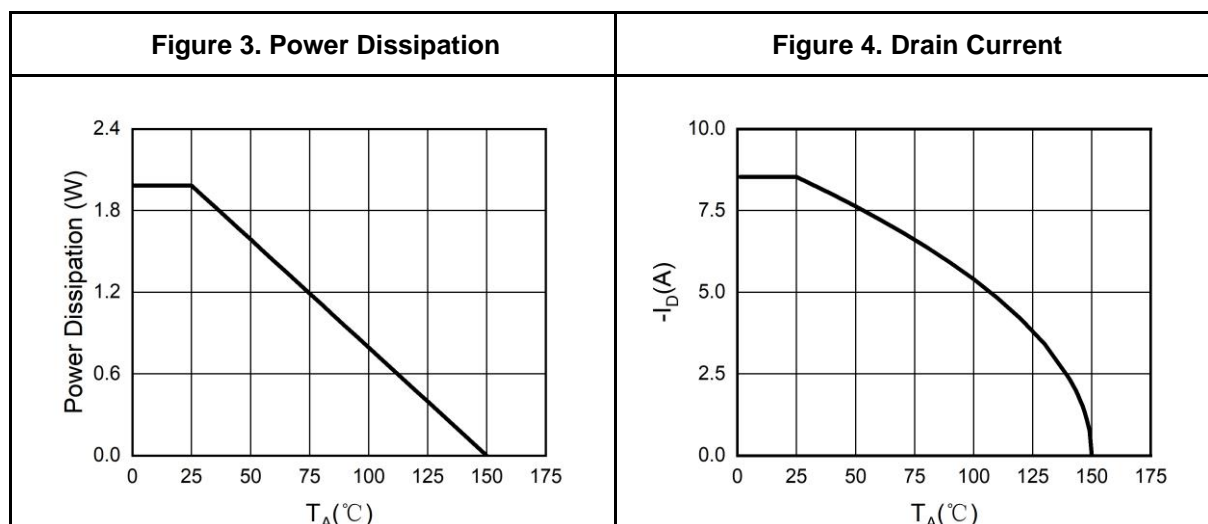
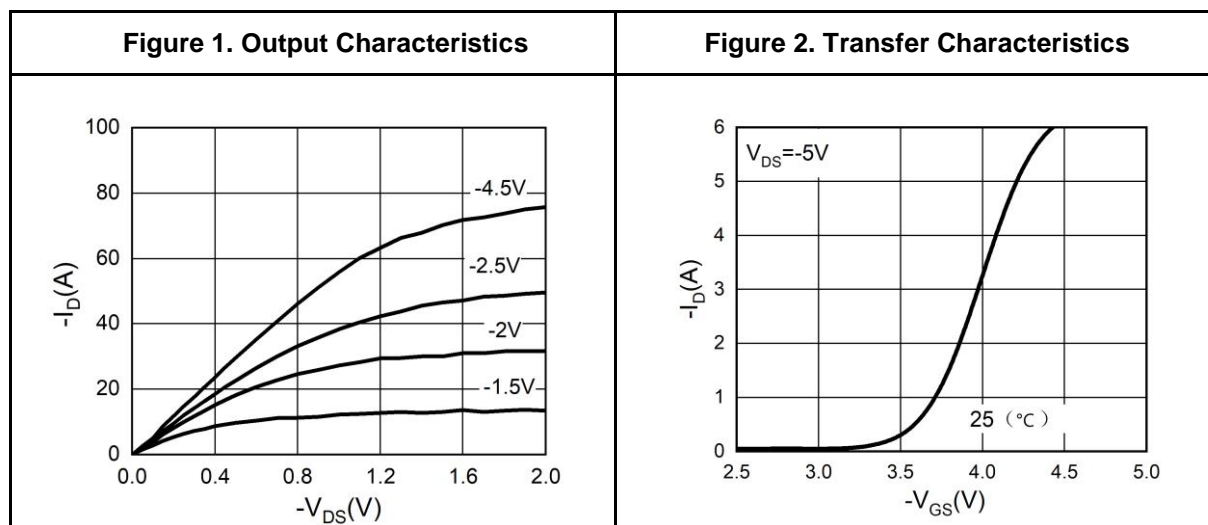
Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=-12V, V_G=-10V, R_g=25\Omega, L=0.5\text{mH}$.

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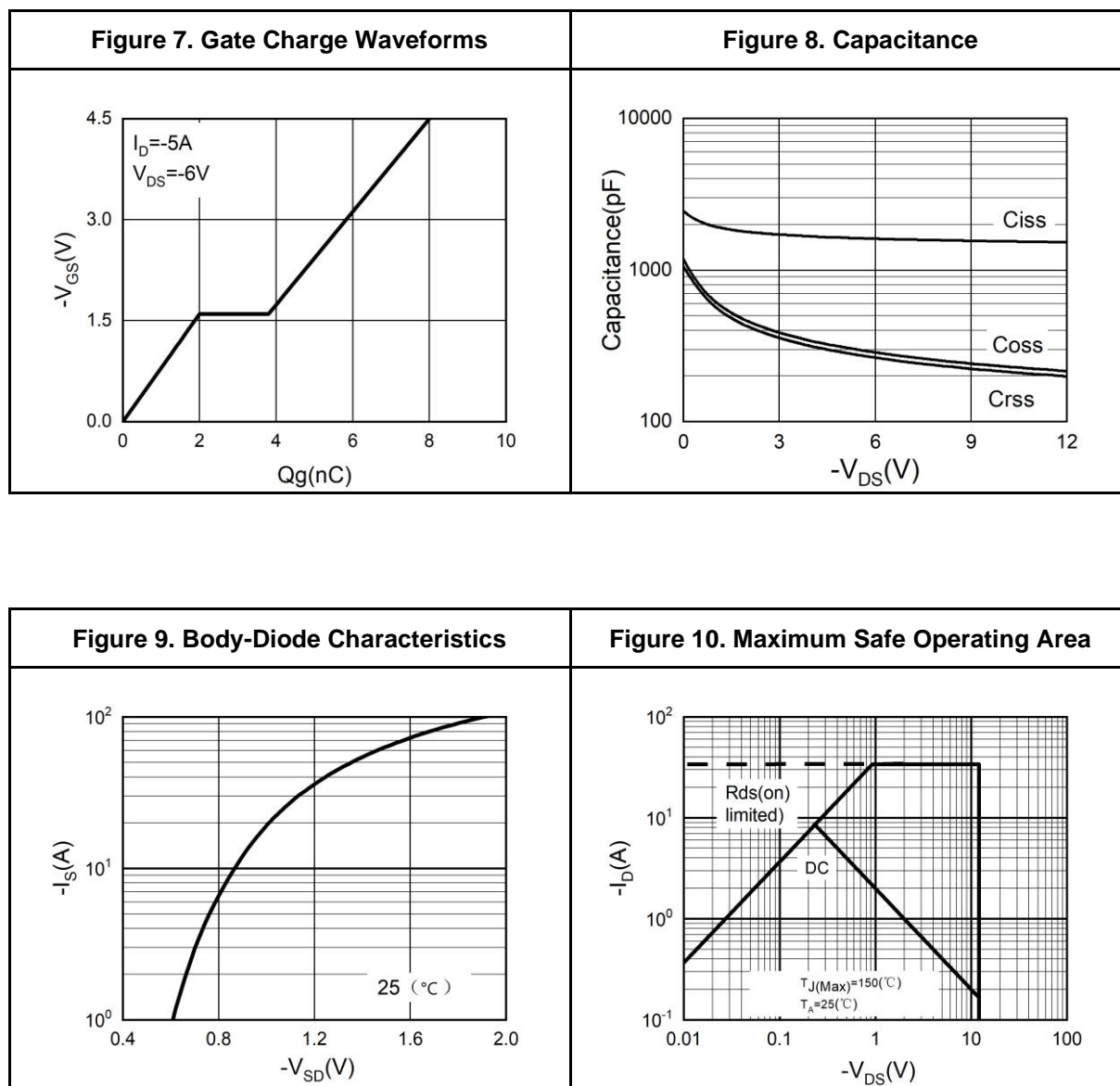
Typical Electrical And Thermal Characteristics (Curves)





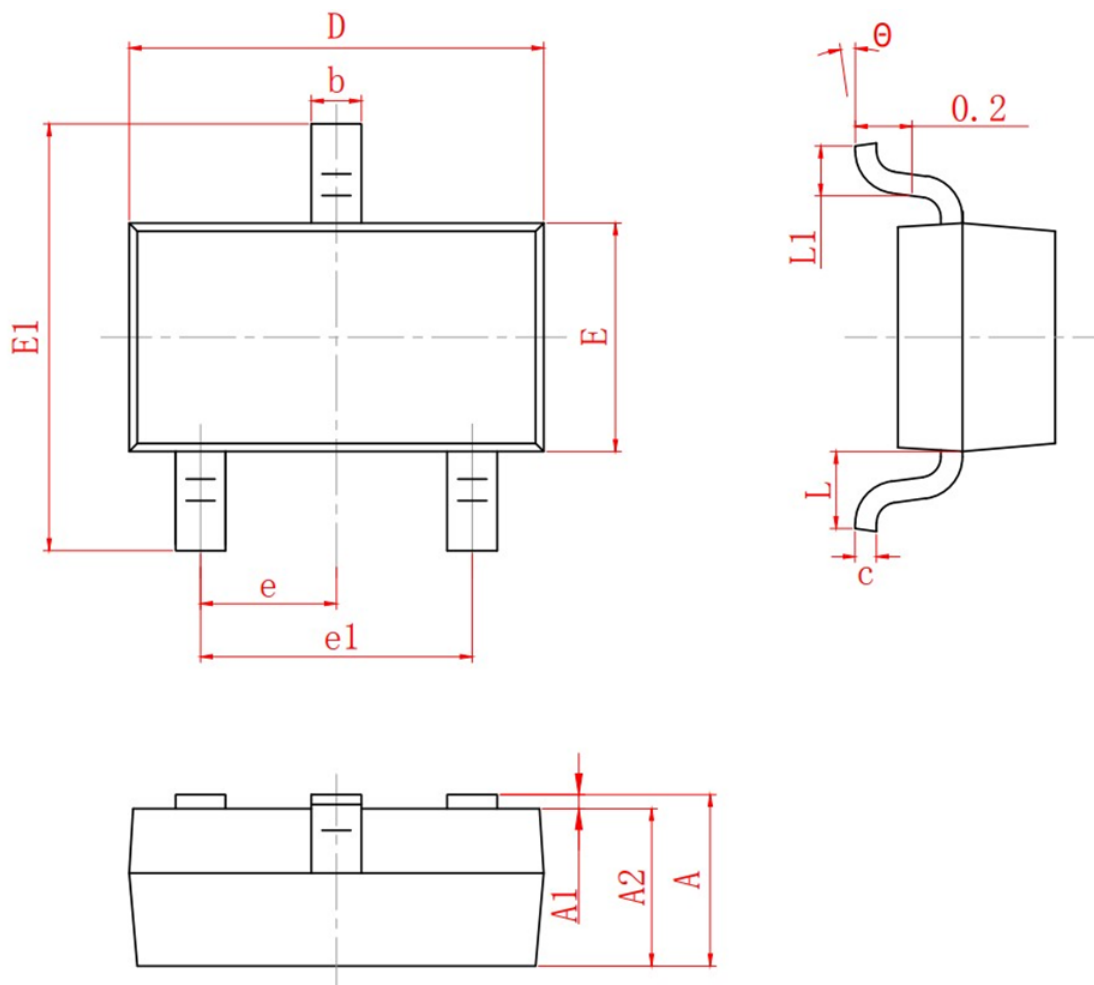
12V P-Channel Trench Power MOSFET

Typical Electrical And Thermal Characteristics (Curves)





SOT-23-3L Package Information



SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		



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