



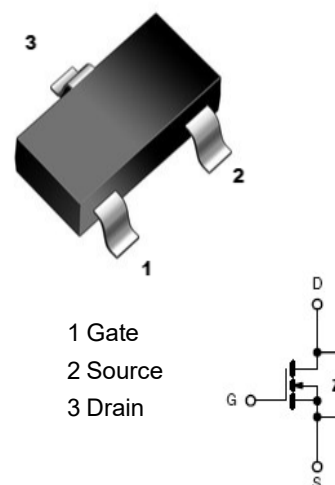
1. Features

- TrenchFET Power MOSFET
- Excellent RDS(on) and Low Gate Charge

2. Mechanical Data

- Case: Molded Plastic, SOT-23 .
- Epoxy: UL 94V-0 rate flame retardant
- Terminals: Plated Leads Solderable per MIL-STD-750, Method-2026.
- Marking: S12
- Mounting Position : Any.

SOT-23



3. Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	UNIT
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±8	V
Continuous Drain Current	I_D	6	A
Drain Current-Pulsed	I_{DM}	20	A
Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	°C/W
Junction and Storage Temperature Range	T_J, T_{STG}	-55~ +150	°C

**4. Electrical Characteristics**

Rating at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D =250μA	20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =20V, V _{GS} = 0V			1	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±8V, V _{DS} = 0V			±100	nA
On characteristics						
Drain-source on-resistance ¹	R _{DS(on)}	V _{GS} =4.5V, I _D =5A		17	32	mΩ
		V _{GS} =2.5V, I _D =4.7A		20	36	mΩ
		V _{GS} =1.8V, I _D =4.3A		30	42	mΩ
Forward tranconductance ¹	g _{FS}	V _{DS} =10V, I _D =5A	6			S
Gate threshold voltage ¹	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.4	0.7	1.0	V
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f =1MHz		865		pF
Output capacitance	C _{oss}			105		pF
Reverse transfer capacitance	C _{rss}			55		pF
Gate resistance	R _g	f =1MHz	0.5		4.8	Ω
Switching Characteristics ²						
Turn-on delay time	t _{d(on)}	V _{GS} =5V, V _{DD} =10V, I _D =4A, R _G =1Ω, R _L =2.2Ω			10	ns
Turn-on rise time	t _r				20	ns
Turn-off delay time	t _{d(off)}				32	ns
Turn-off fall time	t _f				12	ns
Source-drain diode characteristics and maximum ratings						
Diode forward voltage	V _{SD}	I _S =4A, V _{GS} =0V		0.75	1.2	V

Note :

1. Pulse Test : pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. These parameters have no way to verify.



5. Rating And Characteristic Curves

Fig1: Output Characteristics

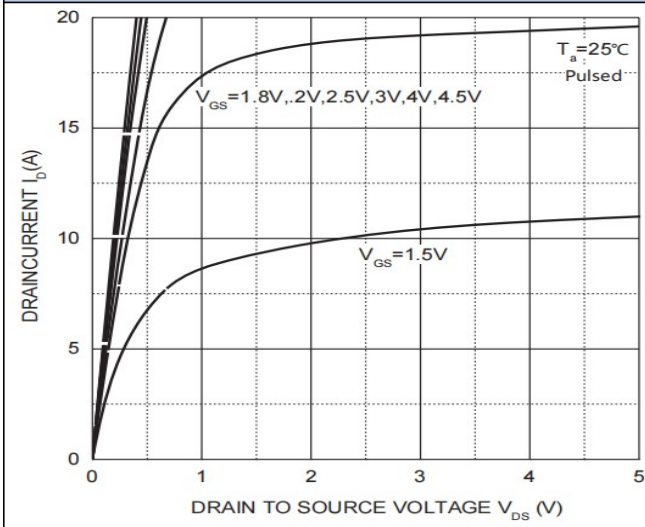


Fig2: Transfer Characteristics

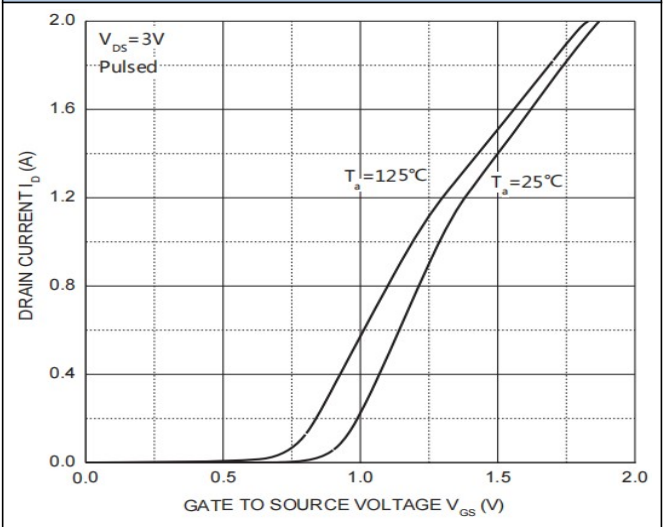


Fig.3 $R_{DS(on)} - I_D$

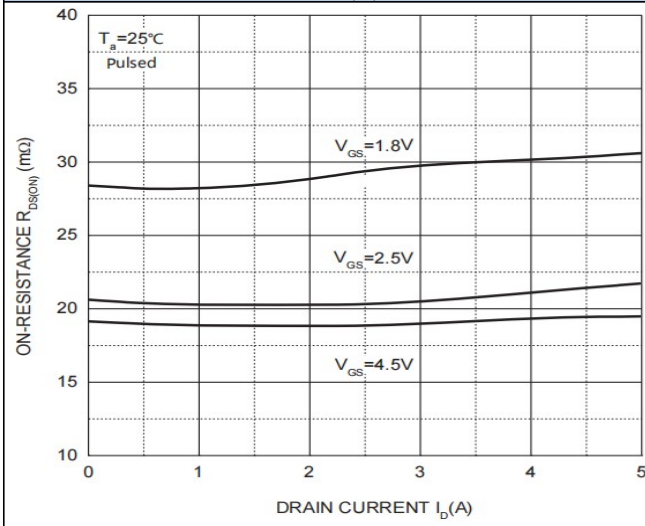


Fig.4 $R_{DS(on)} - V_{GS}$

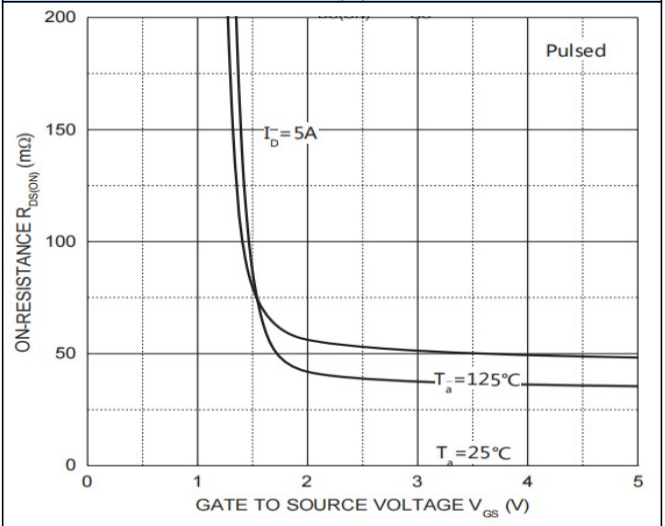


Fig.5 $I_S - V_{SD}$

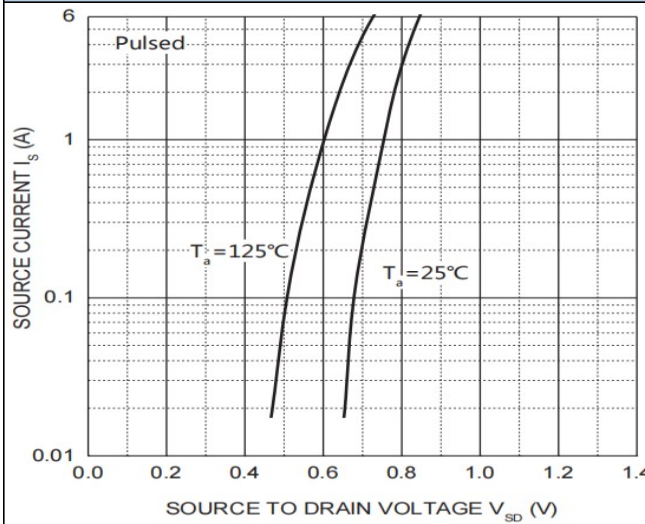
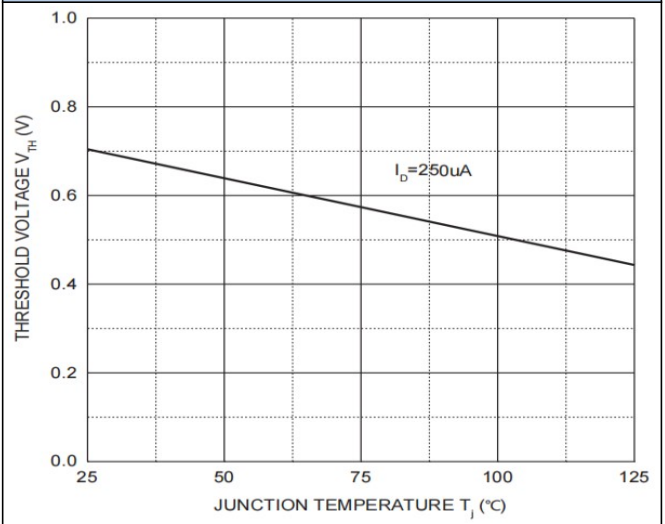
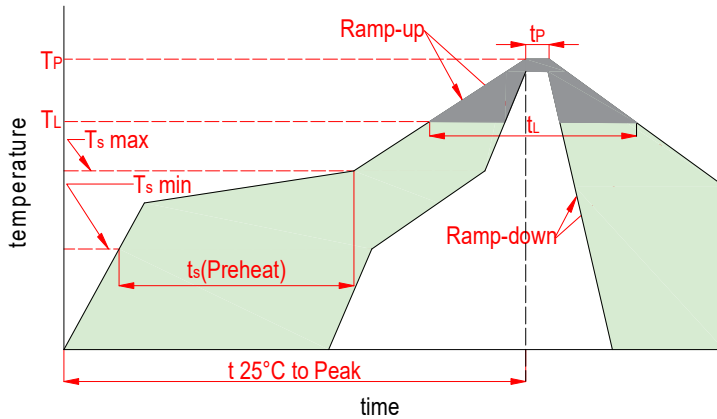


Fig.6 Threshold Voltage



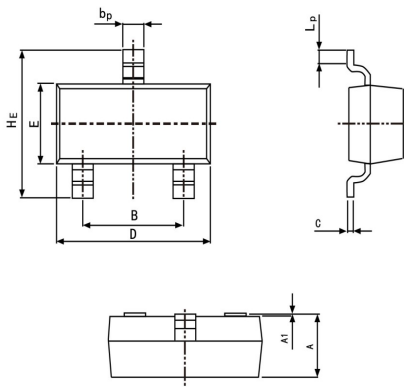


6. Soldering Parameters



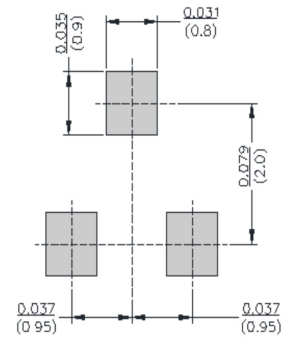
Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s (min))	150℃
	Temp. max(T_s (min))	200℃
	Time(min to max)(t_s)	60~120s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
T_s (max) to T_L -Ramp-up Rate		3℃/s max
Reflow	Temp.(T_L)(Liquidus)	217℃
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_P)		260 ^{+0/-5} ℃
Time within actual peak Temp.(t_p)		30s max
Ramp-down Rate		6℃/s max
Time 25℃ to peak Tempe.(T_P)		8 minutes max
Do not exceed		260℃

7. Dimensions

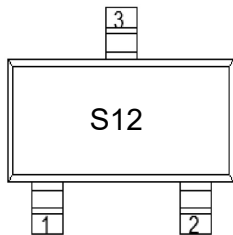


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.035	0.045	0.90	1.15
B	0.070	0.081	1.78	2.05
bp	0.012	0.020	0.30	0.51
C	0.003	0.007	0.08	0.18
D	0.110	0.118	2.80	3.00
E	0.047	0.055	1.20	1.40
HE	0.087	0.110	2.20	2.80
A1	0.000	0.004	0.00	0.10
LP	0.008	0.020	0.20	0.50

Mounting PAD Layout



8. Part Marking System



9. Package Information

Package	Part Number	Tape Width(mm)	Quantity(pcs)
SOT-23	XN2312	8	3000



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