



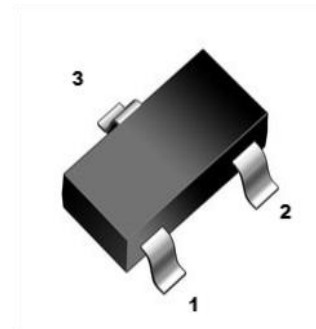
Features

- TrenchFET Power MOSFET
- Excellent RDS(on) and Low Gate Charge
- ESD Protected Up to 2.0KV (HBM)

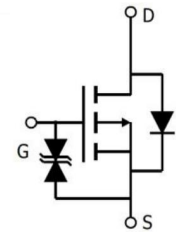
Mechanical Data

- Case:Molded Plastic,SOT-23 .
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable perMIL-STD-750,Method-2026.
- Marking: 39KA.
- Mounting Position : Any.
- Equivalent Circuit:

SOT-23



1 Gate
2 Source
3 Drain



Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	-0.5	A
Pulsed Drain Current ($t=300\mu s$)	I_{DM}	-2.6	A
Power Dissipation	P_D	0.35	W
Junction Temperature	T_J	-55~ +150	°C
Storage Temperature	T_{STG}	-55~ +150	°C

**Electrical Characteristics**

Rating at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D =250μA	-20			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	-0.3	-0.6	-1	
Gate-source leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} =±10V			±10	μA
Zero gate voltage drain current	I _{DSS}	V _{DS} =-20V,V _{GS} = 0V			-1	μA
Drain-source on-resistance (note 1)	R _{DS(on)}	V _{GS} =-4.5V, I _D =-0.5A		0.58	0.85	Ω
		V _{GS} =-2.5V, I _D =-0.3A		0.85	1.2	
Dynamic Characteristics (note 2,3)						
Input capacitance	C _{iss}	V _{DS} =-10V,V _{GS} =0V,f =1MHz		71		pF
Output capacitance	C _{oss}			20		
Reverse transfer capacitance	C _{rss}			15		
Total gate charge	Q _g	v _{DS} =-10V,V _{GS} =-4.5V,I _D =-0.2A		1.2		nC
Gate-source charge	Q _{gs}			0.37		
Gate-drain charge	Q _{gd}			0.27		
Turn-on delay time	t _{d(on)}	V _{DD} =-10V,I _D =-0.2A, V _{GS} =-4.5V,R _G =10Ω		4		ns
Turn-on rise time	t _r			19		
Turn-off delay time	t _{d(off)}			16		
Turn-off fall time	t _f			25		
Source-drain diode characteristics and maximum ratings						
Continuous source-drain diode	I _S	T _C =25℃			-0.5	A
Diode forward voltage	V _{SD}	V _{GS} =0V,I _S =-1A		-0.7	-1.2	V

Note :

1. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
2. Guaranteed by design, not subject to production testing.
3. These parameters have no way to verify.



Rating And Characteristic Curves

Fig1: Output Characteristics

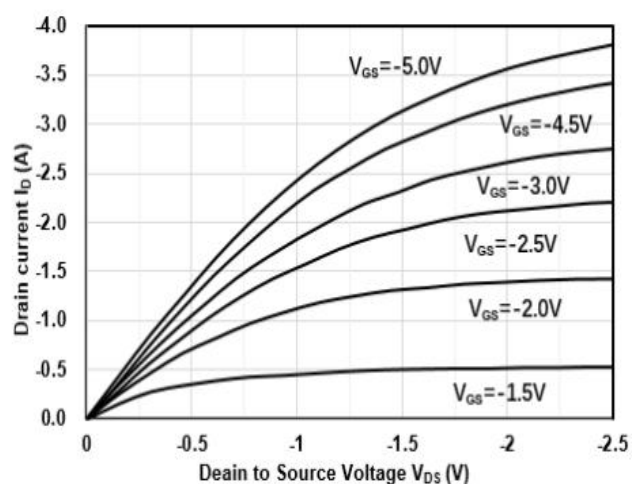


Fig2: Transfer Characteristics

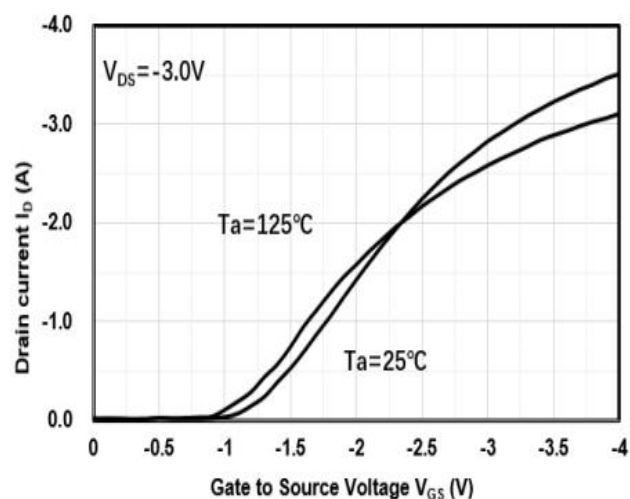


Fig.3 Capacitance Characteristics

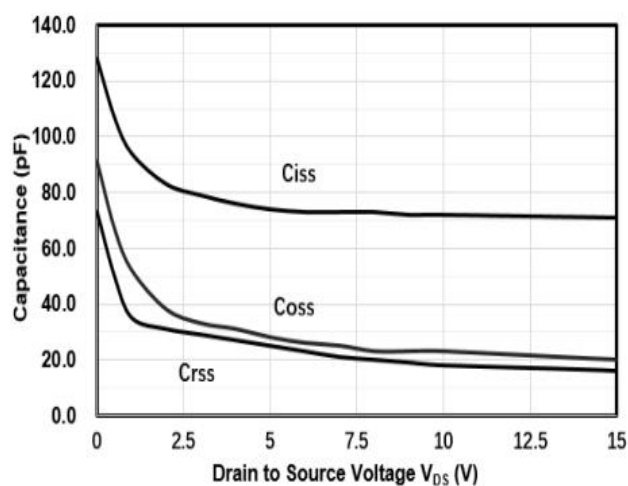


Fig4: Gate Charge

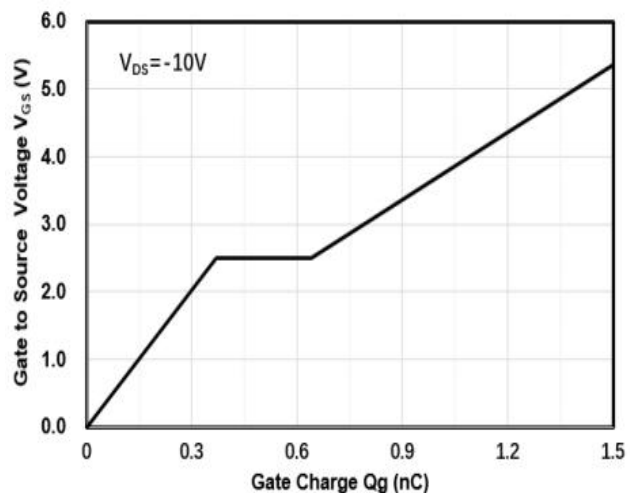


Fig.5 Drain-Source on Resistance

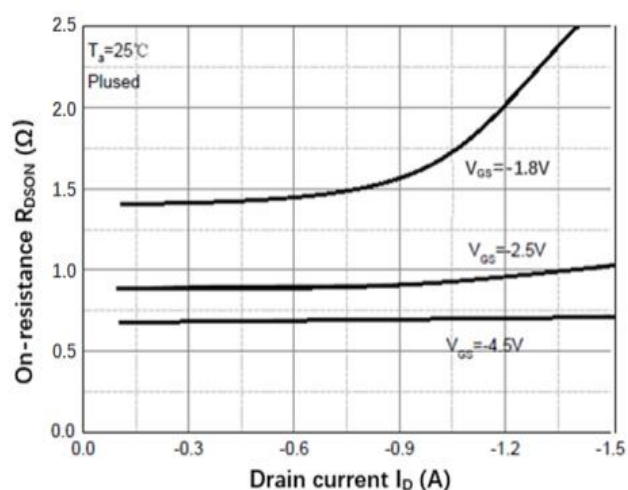
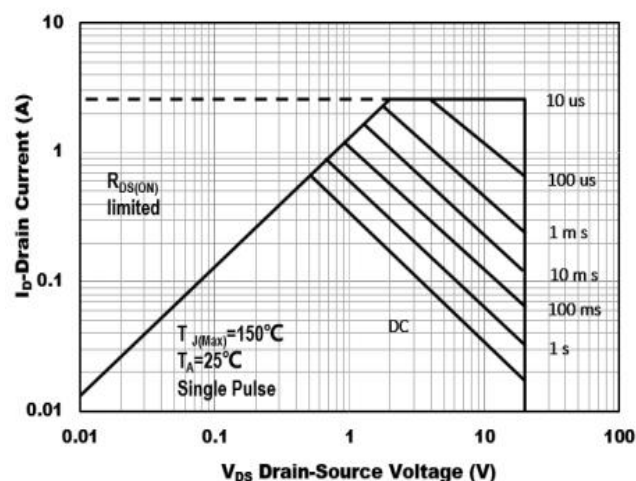
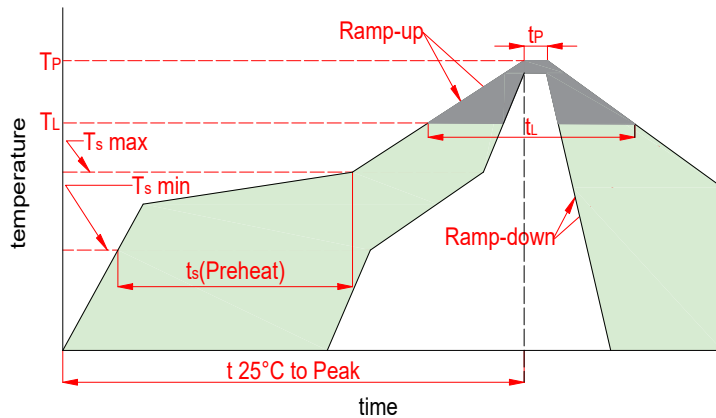


Fig.6 Safe Operating Area



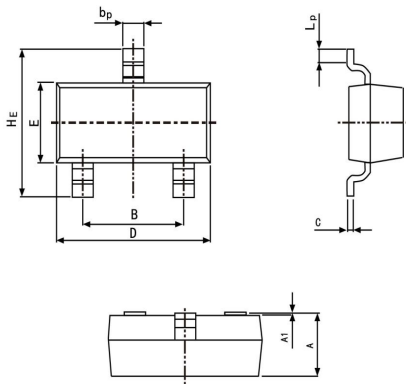


6. Soldering Parameters

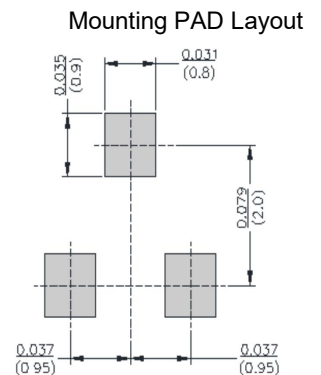


Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s (min))	150℃
	Temp. max(T_s (min))	200℃
	Time(min to max)(t_s)	60~120s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
T_s (max) to T_L -Ramp-up Rate		3℃/s max
Reflow	Temp. (T_L)(Liquidus)	217℃
	Temp. (t_L)(Liquidus)	60~150s
Peak Temp. (T_P)		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℃

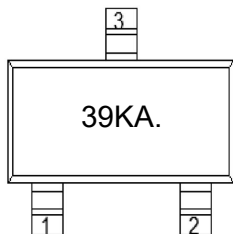
7. Dimensions



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



8. Part Marking System



9. Package Information

Package	Part Number	Tape Width(mm)	Quantity(pcs)
SOT-23	XN3139K	8	3000



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