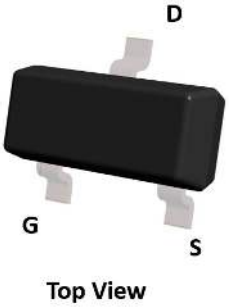
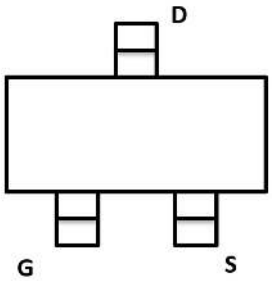
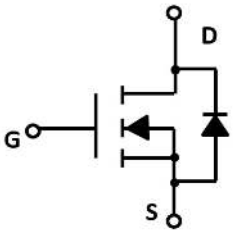
N-Channel Enhancement Mode Field Effect Transistor



Top View





SOT-23

Product Summary

- V_{DS} 100V
- I_D 3A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜140 mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜300 mohm

General Description

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

- DC-DC Converters
- Power management functions

■ Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	100	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_A=25℃	I_D	3	A
	T_A=70℃		2.4	
Pulsed Drain Current [A]		I_{DM}	12	A
Avalanche energy [B]		E_{AS}	8	mJ
Total Power Dissipation [C]	T_A=25℃	P_D	1.2	W
	T_A=70℃		0.8	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [D]	t≤10S	$R_{\theta JA}$	82	104	℃/W
Thermal Resistance Junction-to-Ambient [D E]	Steady-State		111	140	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JL}$	43	52	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJL03G10A	F2	1003.	3000	30000	120000	7"Reel

■ Electrical Characteristics (T_j=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1.0	1.8	3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=3A		110	140	mΩ
		V_{GS}= 4.5V, I_D=2A		160	300	mΩ
Diode Forward Voltage	V_{SD}	I_S=3A,V_{GS}=0V			1.3	V
Maximum Body-Diode Continuous Current	I_S				3	A
Gate resistance	R_G	f= 1 MHz, Open drain		8		Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=50V,V_{GS}=0V,f=100KHZ		206		pF
Output Capacitance	C_{oss}			28.9		
Reverse Transfer Capacitance	C_{rss}			1.4		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=50V,I_D=3A		4.3		nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			1.1		
Reverse Recovery Chrage	Q_{rr}	I_F=3A, di/dt=100A/us		39.4		
Reverse Recovery Time	t_{rr}			32.1		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=50V,I_D=3A R_{GEN}=2Ω		14.7		
Turn-on Rise Time	t_r			3.5		
Turn-off Delay Time	$t_{D(off)}$			20.9		
Turn-off fall Time	t_f			2.7		

A. Repetitive rating; pulse width limited by max. junction temperature.
B. V_{DD}=50V, R_G=25Ω, L=0.5mH.
C. Pd is based on max. junction temperature, using ≤10us junction-to-ambient thermal resistance.
D. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any given application depends on the user's specific board design.
E. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient

■ Typical Performance Characteristics

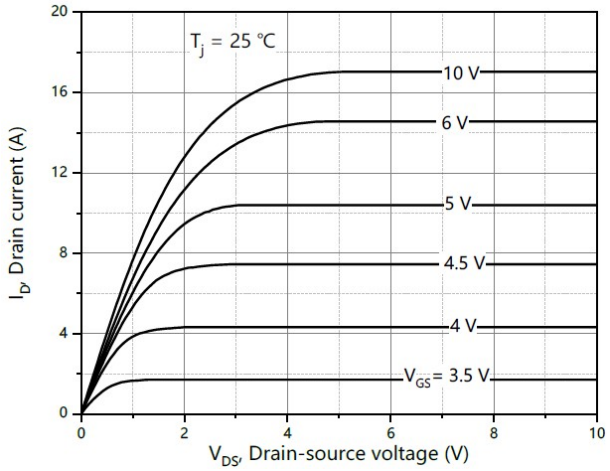


Figure1. Output Characteristics

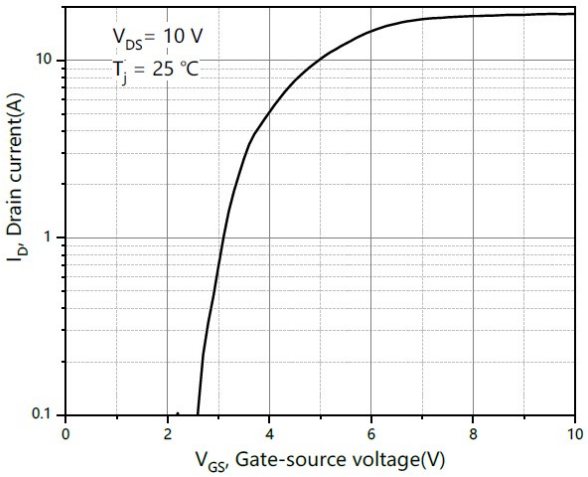


Figure2. Transfer Characteristics

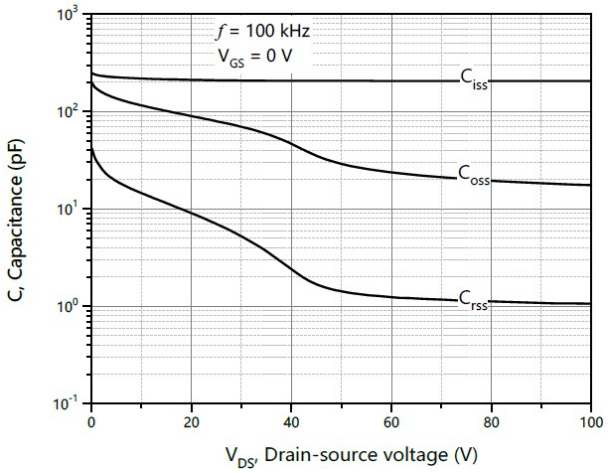


Figure3. Capacitance Characteristics

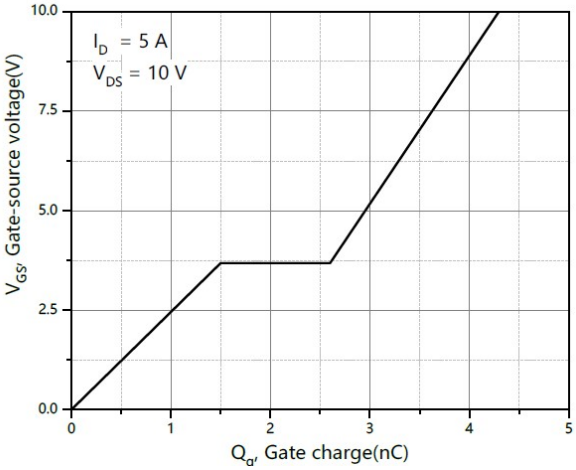


Figure4. Gate Charge

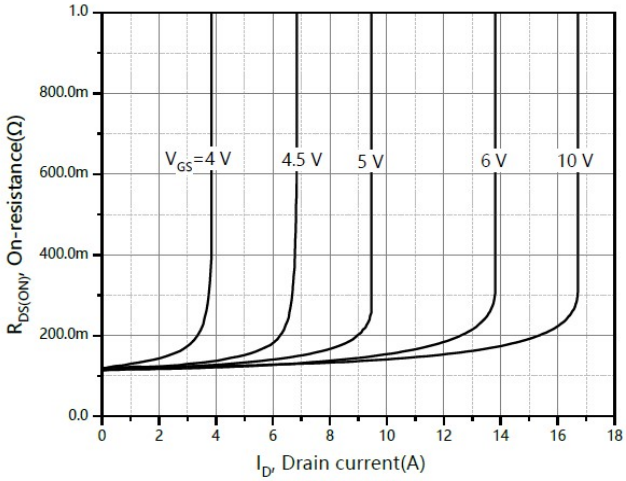


Figure5. : On-Resistance vs. Drain Current and Gate Voltage

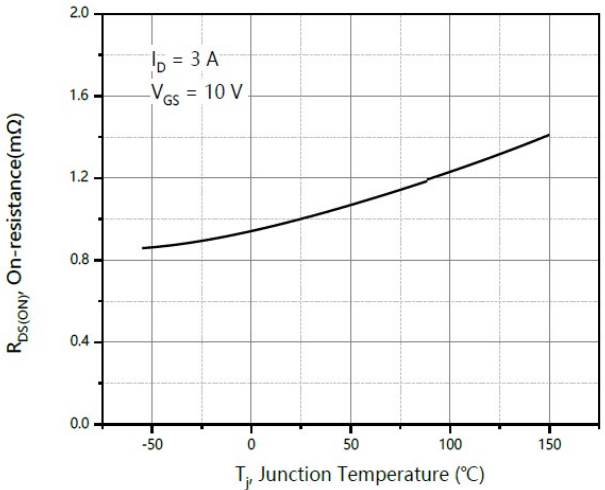


Figure6.Normalized On-Resistance

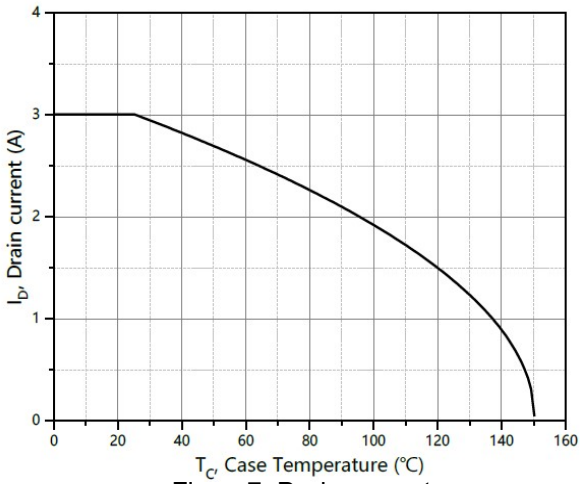


Figure7. Drain current

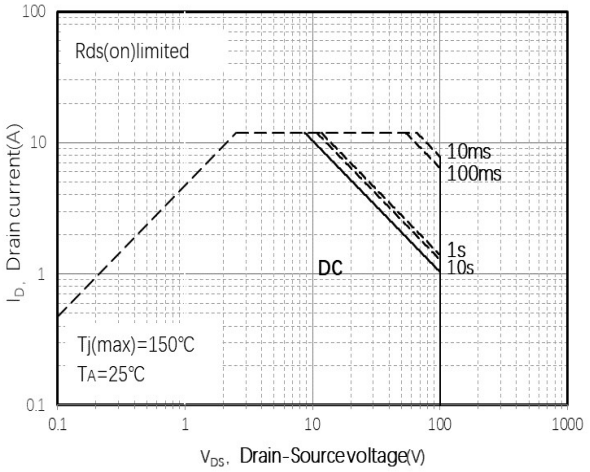


Figure8.Safe Operation Area

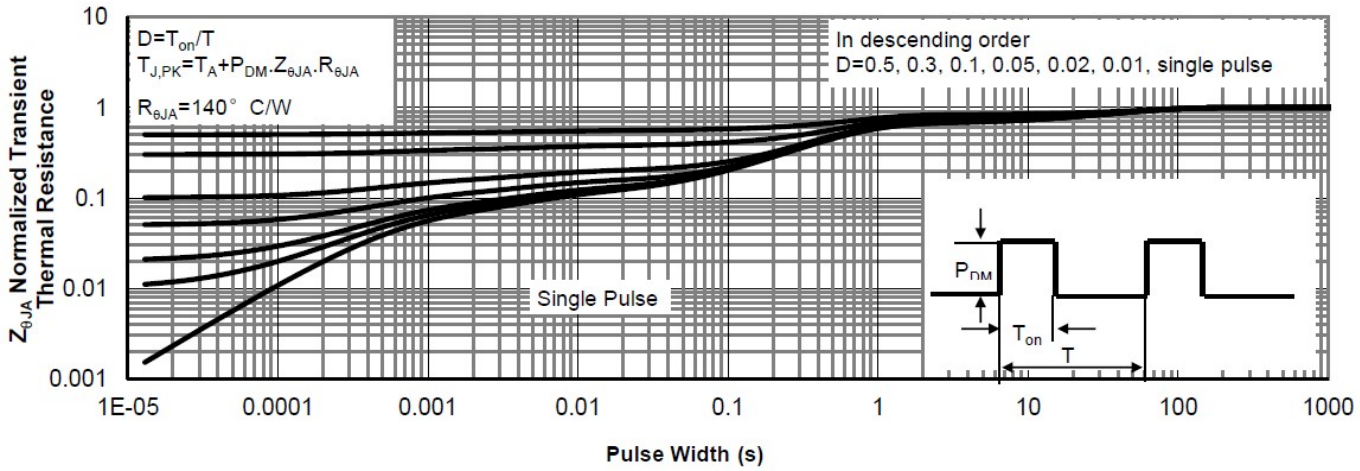
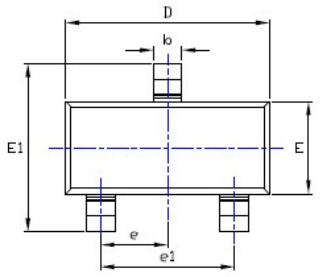
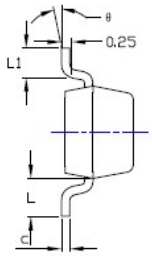


Figure9.Normalized Maximum Transient thermal impedance

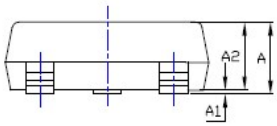
■ SOT-23 Package information



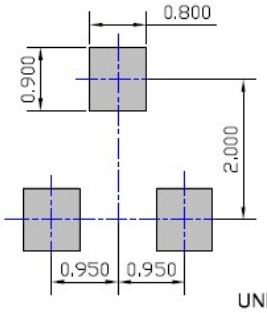
TOP VIEW



SIDE VIEW



SIDE VIEW



UNIT：mm

SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS						
SYMBOL	INCHES			Millmeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.035	---	0.045	0.900	---	1.150
A1	0.000	---	0.004	0.000	---	0.100
A2	0.035	0.038	0.041	0.900	0.975	1.050
b	0.012	0.016	0.020	0.300	0.400	0.500
c	0.004	---	0.008	0.100	---	0.200
D	0.110	0.114	0.118	2.800	2.900	3.000
E	0.047	0.051	0.055	1.200	1.300	1.400
E1	0.089	0.094	0.100	2.250	2.400	2.550
e	0.037TYP			0.950TYP		
e1	0.071	0.075	0.079	1.800	1.900	2.000
L	0.022REF			0.550REF		
L1	0.012	0.016	0.200	0.300	0.400	0.500
θ	0°	---	8°	0°	---	8°

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

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