

-30V P Channel Enhancement MOSFET

Description

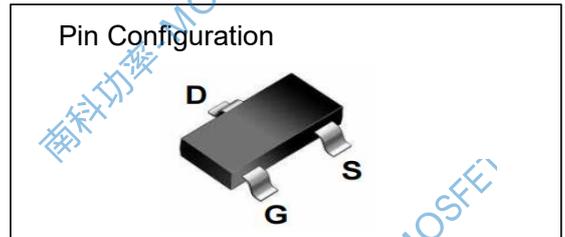
The 7P03 is the new generation trench P-channel MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications

V_{DSS}	-30V
I_D	-7A
$R_{DS(ON)}$	21mΩ @ $V_{GS} = -10V$
$R_{DS(ON)}$	32mΩ @ $V_{GS} = -4.5V$

Features

- High - speed switching
- Excellent gate charge x $R_{DS(ON)}$ product (FOM) for extremely low $R_{DS(ON)}$
- Lead-Free, Halogen-Free; RoHS Compliant

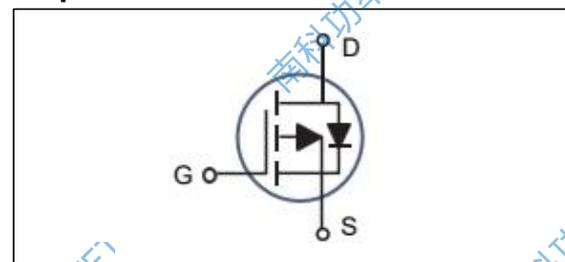
Outline



Applications

- Battery Protection
- Load Switch
- Power Management
- Notebook

Equivalent



Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
7P03	SOT-23-3	7P03	3000

Absolute Maximum Ratings

Parameter	Symbol	Limit	Units	
Drain-Source Voltage	V_{DS}	-30	V	
Gate-Source Voltage	V_{GS}	±20	V	
Drain Current-Continuous ^(Note2)	I_D	$T_C = 25^\circ C$	-7	A
		$T_C = 70^\circ C$	-5.5	A
-Pulsed ^(Note 1- Note 2)	I_{DM}	-28	A	
Maximum Power Dissipation	P_D	$T_C = 25^\circ C$	1.6	W
		$T_C = 70^\circ C$	1.2	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C	
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	85	°C /W	

Electrical Characteristics (T_c=25 °C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V			-1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250uA	-1	-1.5	-2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-6A		21	24	mΩ
		V _{GS} =-4.5V, I _D =-3A		32	39	mΩ
Forward Transconductance	g _{FS}	V _{GS} =-10V, I _D =-5A		5.5		S
DYNAMIC CHARACTERISTICS <small>Note4</small>						
Input Capacitance	C _{ISS}	V _{DS} =-15V,		850		pF
Output Capacitance	C _{OSS}	V _{GS} =0V,		120		pF
Reverse Transfer Capacitance	C _{RSS}	f =1.0MHz		80		pF
Total Gate Charge	Q _g	V _{DS} =-15V, I _D =-5A, V _{GS} =-10V		14		nC
Gate-Source Charge	Q _{gs}	V _{DS} =-15V, I _D =-5A,		3.2		nC
Gate-Drain Charge	Q _{gd}	V _{GS} =-10V		2.5		nC
SWITCHING CHARACTERISTICS <small>Note4</small>						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =-15V,		5.5		ns
Rise Time	tr	I _D =-1A,		14		ns
Turn-Off Delay Time	t _{D(OFF)}	V _{GS} =-10V,		35		ns
Fall Time	tf	R _{GEN} =5Ω		16		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-5A			-1.0	V

Notes:

- 1、 Pulse Test Width < 300us,Duty Cycle< 2%
- 2、 Drain current limited by maximum junction temperature.
- 3、 Starting T_j=25°C ,L=0.1mH,V_{DD}=-15V,V_{GS}=-10V ,R_G=25Ω
- 4、 Guaranteed by design,not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. TC
 T_C , Case Temperature ($^{\circ}C$)

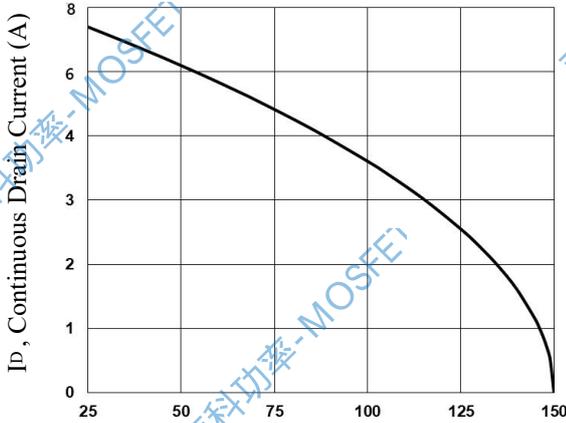


Fig.2 Normalized RDSON vs. TJ
 T_J , Junction Temperature ($^{\circ}C$)

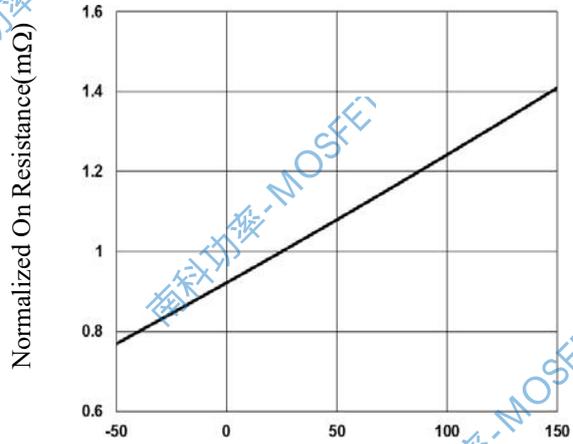


Fig.3 Normalized Vth vs. TJ
 T_J , Junction Temperature ($^{\circ}C$)

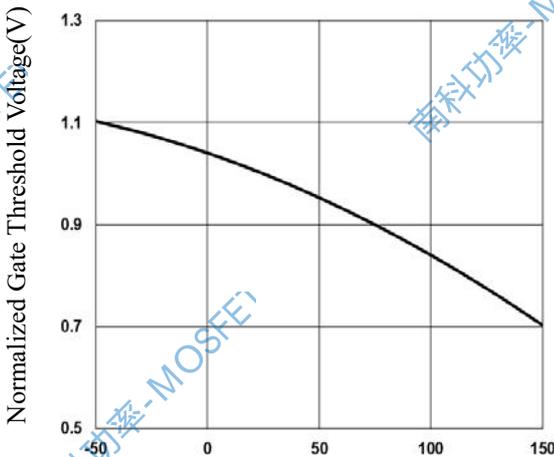


Fig.4 Gate Charge Waveform
 Q_g , Gate Charge (nC)

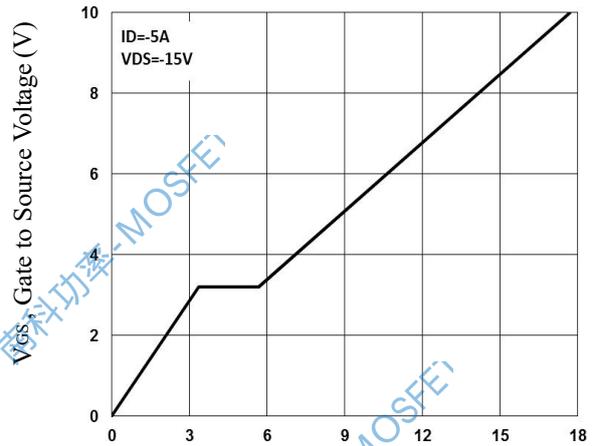


Fig.5 Normalized Transient Impedance
 Square Wave Pulse Duration (s)

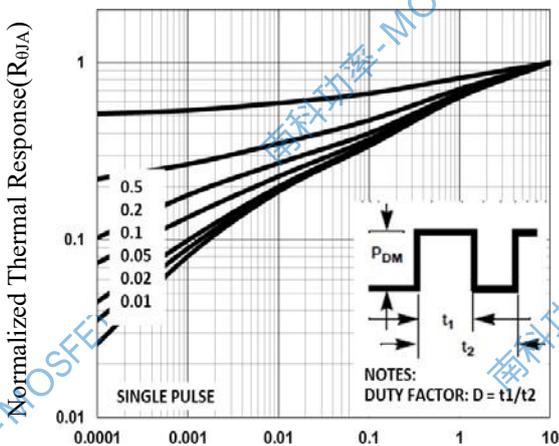


Fig.6 Maximum Safe Operation Area
 $-V_{DS}$, Drain to Source Voltage (V)

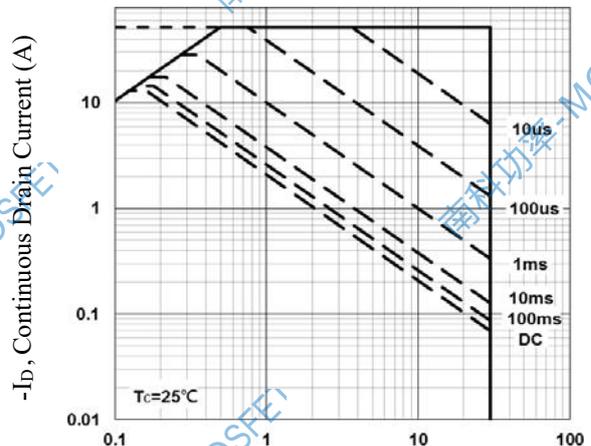


Figure 7a. Switching Test Circuit

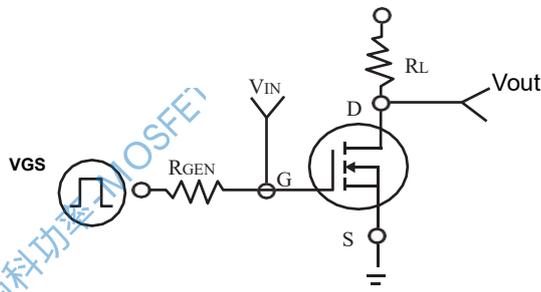


Figure 7b. Switching Waveforms

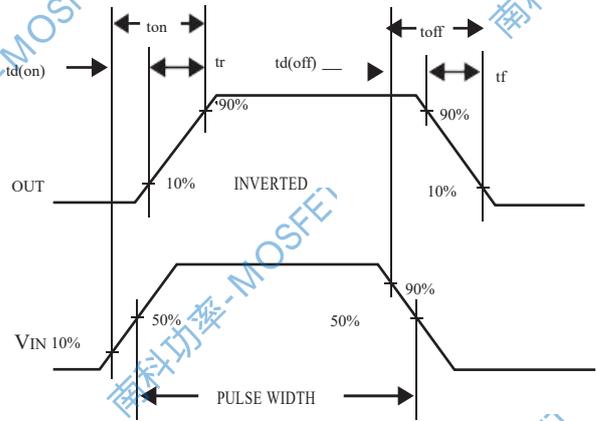


Figure 8a. Unclamped Inductive Test Circuit

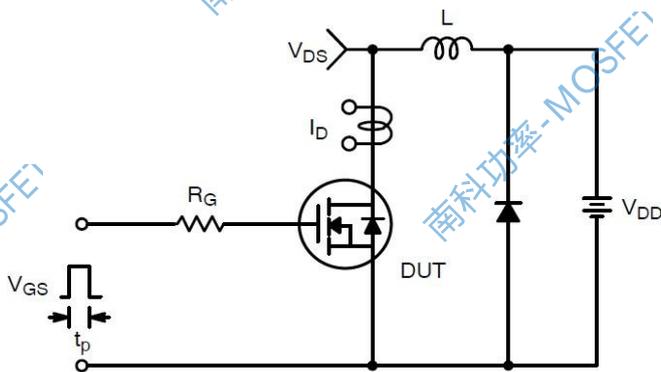
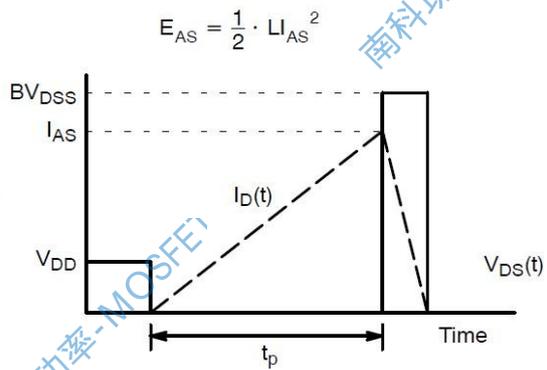


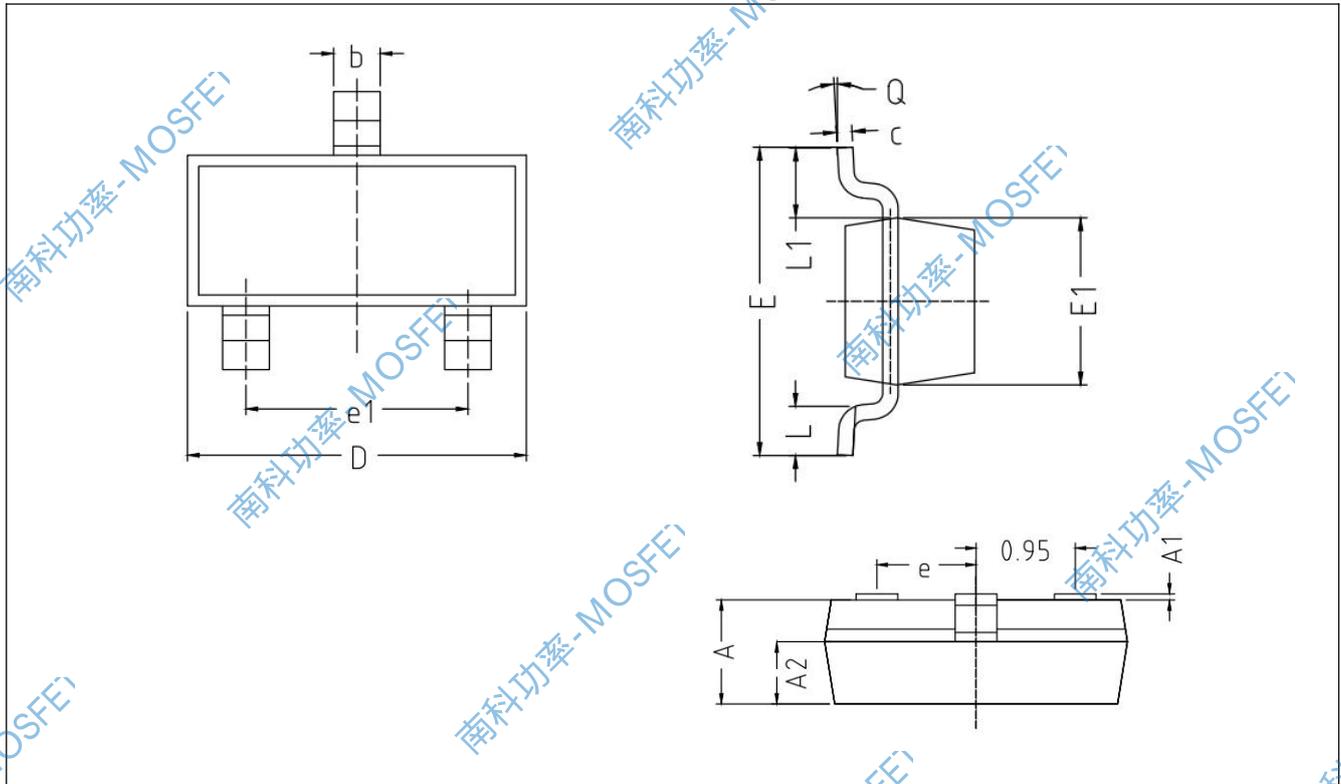
Figure 8b. Unclamped Inductive Waveforms



NOTICE

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SOT-23-3L Package Information



SOT-23-3LPKG

SYMBOL	MIN	MAX
A	1.050	1.100
A1	0.000	0.100
A2	1.000	1.050
b	0.300	0.450
c	0.100	0.200
D	2.800	3.000
E	2.650	2.750
E1	1.500	1.600
e	0.90	0.95
e1	1.800	2.00
L	0.35	0.450
L1	0.40	0.45
Q	8°	9°