

20V N-Channel MOSFETs

SDM380N02AK

Description

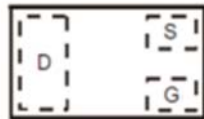
Features

- $V_{DS}=20V$, $I_D=0.75A$
- $R_{DS(ON)} < 0.38\Omega$ @ $V_{GS} = 4.5V$
 $R_{DS(ON)} < 0.45\Omega$ @ $V_{GS} = 2.5V$
- N-Channel Switch with Low $R_{DS(on)}$
- Operated at Low Logic Level Gate Drive
- Surface Mount Package
- ESD Protected

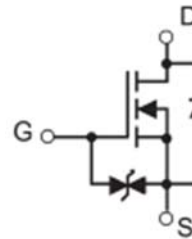
Application

- Battery Protection
- Load Switch
- Power Management

Package



DFN1006-3L


Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		± 10	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	0.75	A
		$T_C = 100^\circ C$	0.5	
I_{DM}	Pulsed Drain Current ^{note1}		3	A
P_D	Power Dissipation	$T_A = 25^\circ C$	0.15	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		833	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^\circ C$

Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = 250μA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} = 0V,	-	-	1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±8V	-	-	±10	μA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	0.3	0.65	1	V
R _{DS(on)}	Static Drain-Source on-Resistance note2	V _{GS} =4.5V, I _D =0.5A	-	0.25	0.38	Ω
		V _{GS} =2.5V, I _D =0.5A	-	0.35	0.45	
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =0.4A	0.8	-	-	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = 16V, V _{GS} = 0V, f = 1.0MHz	-	79	120	pF
C _{oss}	Output Capacitance		-	13	20	pF
C _{rss}	Reverse Transfer Capacitance		-	9	15	pF
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} = 10V, I _D =0.5A, R _{GEN} =10Ω, V _{GS} =4.5V,	-	6.7	-	ns
t _r	Turn-on Rise Time		-	4.8	-	ns
t _{d(off)}	Turn-off Delay Time		-	17.3	-	ns
t _f	Turn-off Fall Time		-	7.4	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	0.75	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	3	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S =0.5A	-	0.7	1.3	V

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

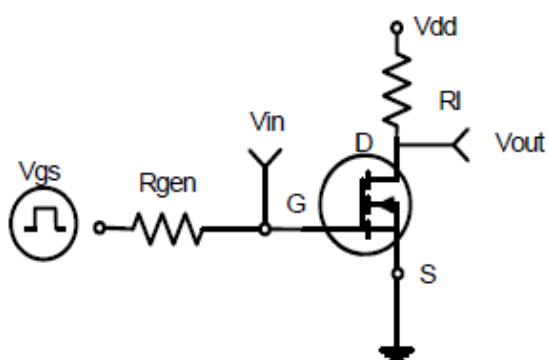


Figure1:Switching Test Circuit

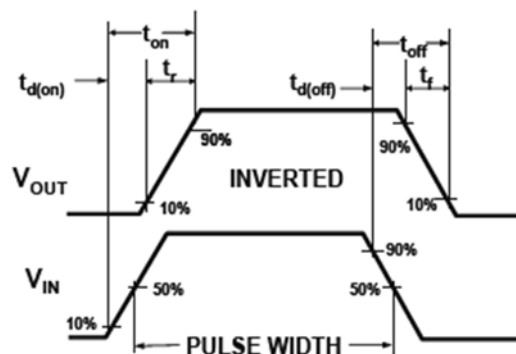
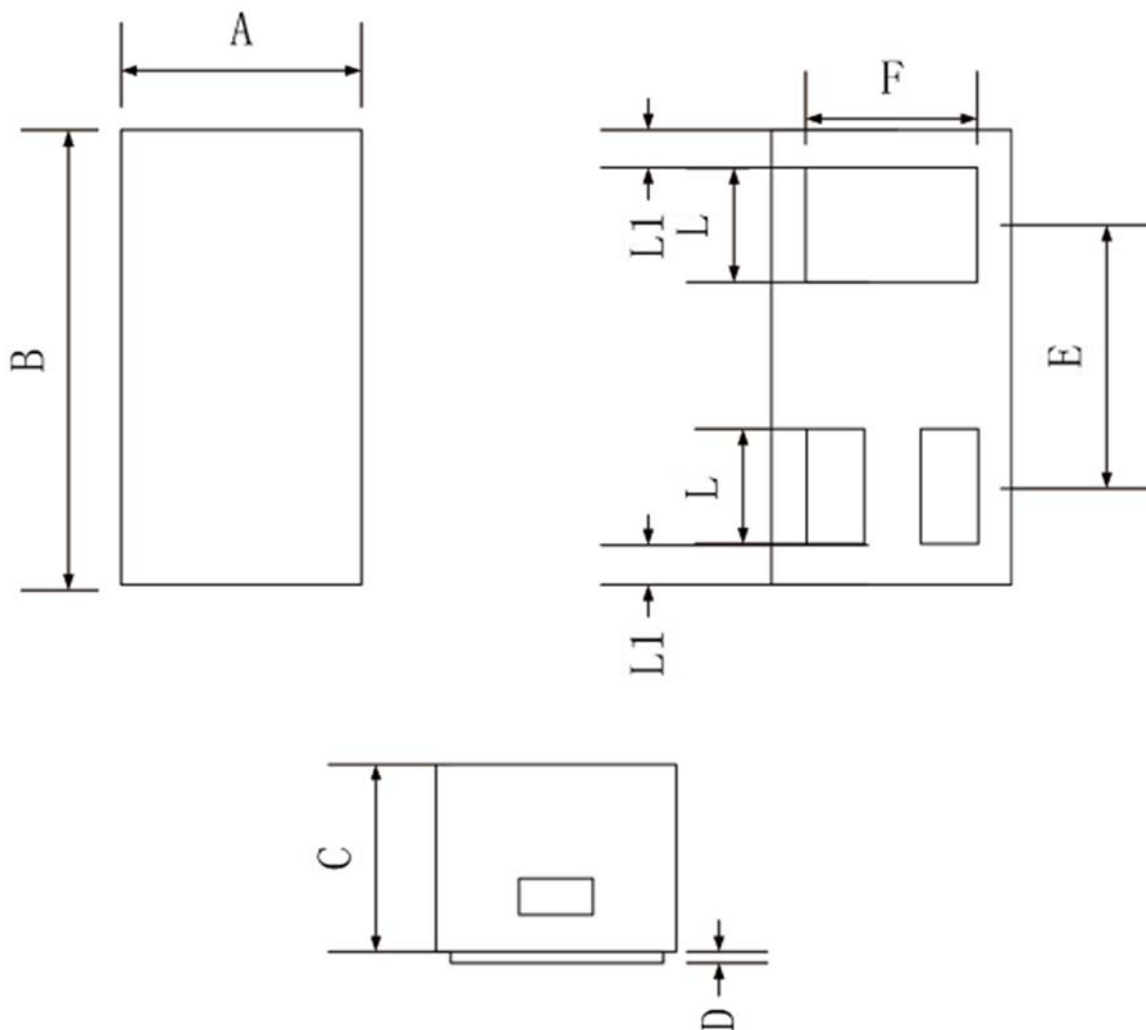


Figure2:Switching Waveforms

Package Mechanical Data



	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.55	0.60	0.65
B	0.95	1.00	1.05
C	0.44	0.47	0.50
D	0.00	0.03	0.05
E	-	0.65	-
F	0.40	0.50	0.60
L	0.20	0.25	0.30
L1	0.05REF		