20V N-Channel MOSFET

Features

- Surface Mount Package
- N-Channel Switch with Low $R_{DS(on)}$
- Operated at Low Logic Level Gate Drive
- ESD Protected
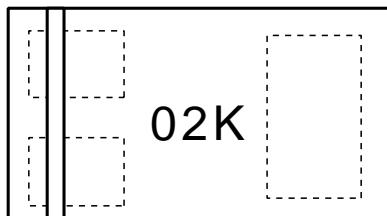
Application

- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

MOSFET Product Summary

V_{DSS}	$R_{DS(ON)\ Max}$	I_D
20V	380mΩ @V_{GS}=4.5V	0.75A
	450mΩ @V_{GS}=2.5V	
	800mΩ @V_{GS}=1.8V	

Package and Pin Configuration

Circuit diagram   **DFN1006-3L**

Marking Information

02K

02K = Device Marking Code
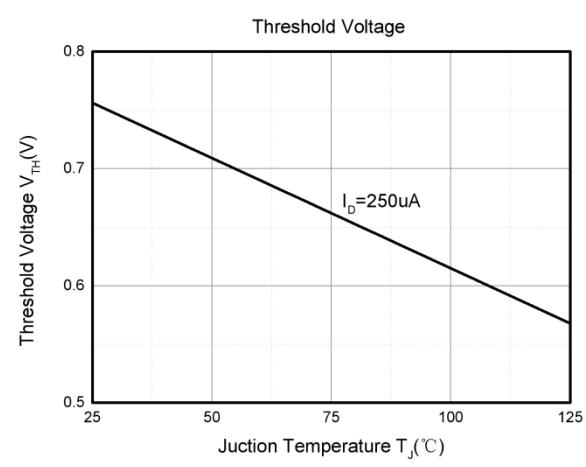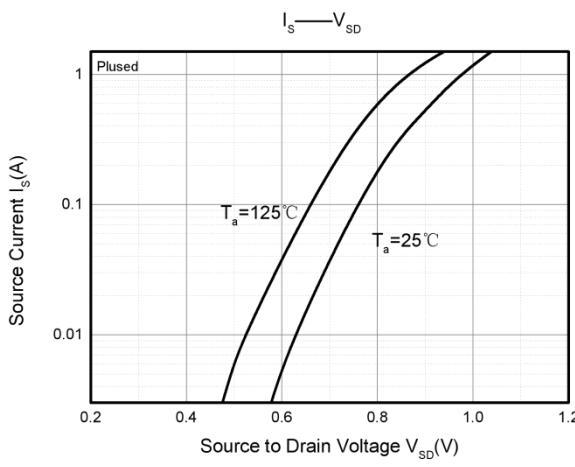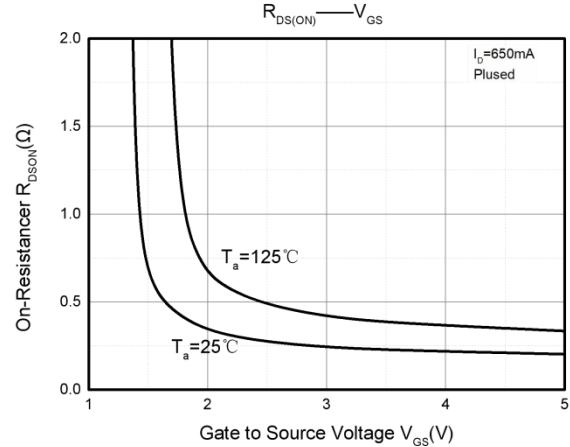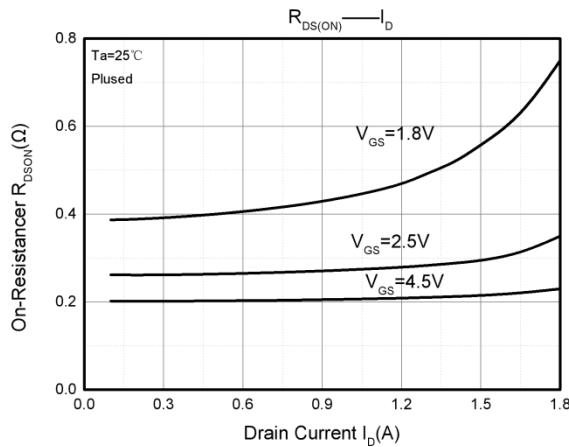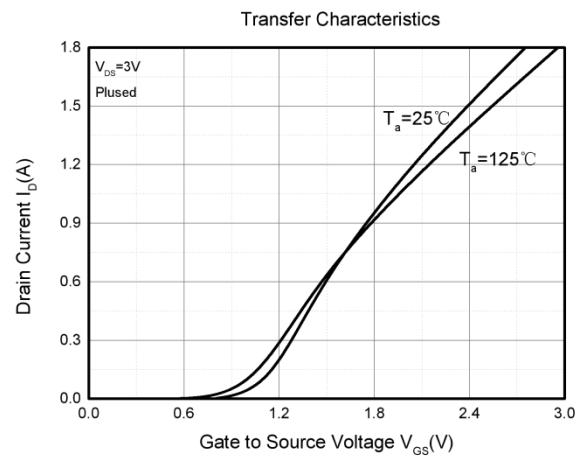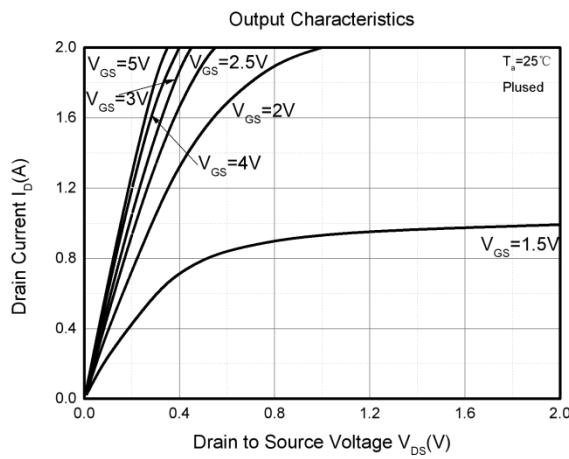
### Absolute Maximum Ratings (T_A=25°C unless otherwise noted)
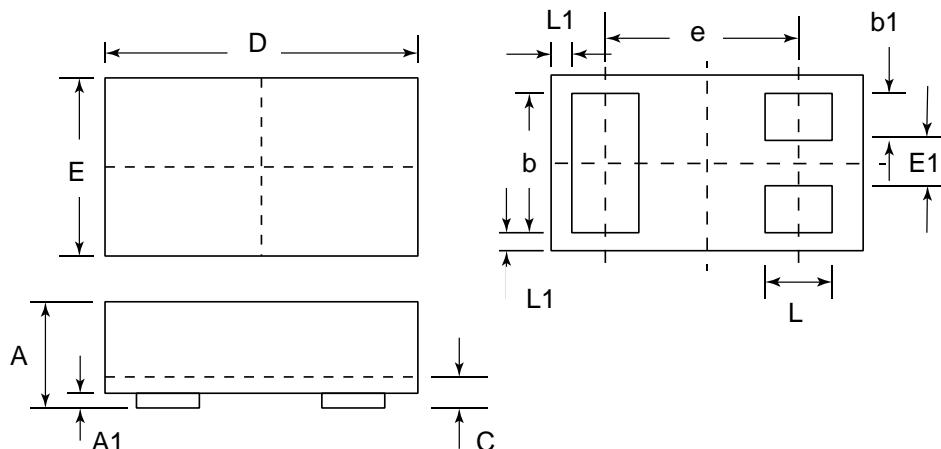
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current	I_D	0.75	A
Pulsed Drain Current	I_{DM}	0.18	A
Power Dissipation	P_D	0.15	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	833	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

Electrical Characteristics (T_A = 25°C unless otherwise noted)
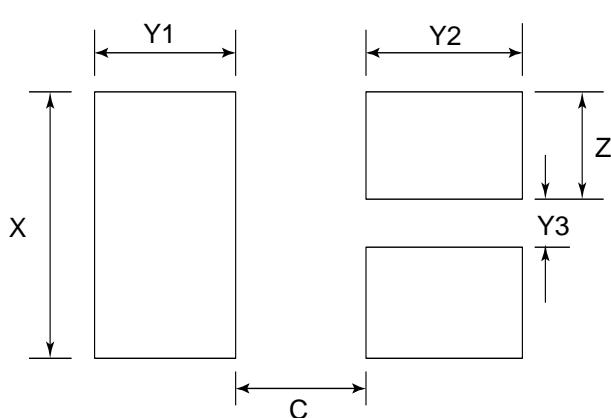
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250µA	20			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =16V, V_{GS} = 0V			1	µA
Gate-body leakage current	I_{GSS}	V_{GS} =±8V, V_{DS} = 0V			±10	uA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250µA	0.3	0.65	1	V
Drain-source on-resistance	$R_{DS(on)}$	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	
		V_{GS} =1.8V, I_D = 0.5A		0.4	0.8	
		V_{GS} =1.5V, I_D = 0.5A		0.5		
		V_{GS} =1.2V, I_D = 0.5A		1		
Dynamic characteristics						
Input Capacitance	Ciss	V_{DS} =16V, V_{GS} =0V, f=1MHz		79	120	pF
Output Capacitance	Coss			13	20	
Reverse Transfer Capacitance	Crss			9	15	
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	V_{GS}=4.5V, V_{DS}=10V, I_D =500mA, R_{GEN}=10Ω		6.7		ns
Turn-on rise time	tr			4.8		
Turn-off delay time	$t_{d(off)}$			17.3		
Turn-off fall time	tf			7.4		
Source-Drain Diode characteristics						
Body Diode Voltage	V_{SD}	I_S=0.5A, V_{GS} = 0V		0.7	1.3	V

Typical Characteristics

Output Characteristics

Transfer Characteristics

$R_{DS(ON)}$——I_D

$R_{DS(ON)}$——V_{GS}

I_S——V_{SD}

Threshold Voltage

DFN1006-3L Package Outline Drawing

SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
b1	0.10	0.15	0.20	0.004	0.006	0.008
C	0.12	0.15	0.18	0.005	0.006	0.007
D	0.95	1.00	1.05	0.037	0.039	0.041
e	0.65 BSC			0.026 BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
E1	0.15	0.20	0.25	0.006	0.008	0.010
L	0.20	0.25	0.30	0.008	0.010	0.012
L1	0.05 REF			0.0002 REF		

Suggested Land Pattern

SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	0.25	0.010
X	0.65	0.024
Y1	0.50	0.020
Y2	0.50	0.020
Y3	0.25	0.010
Z	0.20	0.008