20V N-Channel MOSFETs

General Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BV_{DSS}	$R_{DS(ON)}$Max.	I_D
20V	380mΩ	0.75A

Features

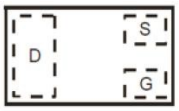
- *20V, 0.75A, $R_{DS(ON)}$Max. = 380mΩ@V_{GS} = 4.5V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*
- *Suit for 1.8V Gate Drive Applications*

Applications

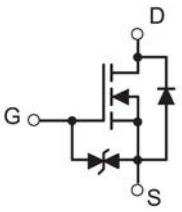
- *Notebook*
- *Load Switch*
- *Hend-Held Instruments*

DFN1006-3 Package

Bottom View



Top View



Absolute Maximum Ratings T_A=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current – Continuous	0.75	A
I_{DM}	Drain Current – Pulsed[1]	1.8	A
P_D	Power Dissipation	0.15	W
ESD	Human Body Model	2500	V
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Note 1: Exceed these limits to damage to the device.
Note 2: Exposure to absolute maximum rating conditions may affect device reliability.

Electrical Characteristics (T_A=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	20			V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=16V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±10V , V_{DS}=0V			±10	uA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	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	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	0.3	0.65	1	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			-2		mV/℃
gfs	Forward Transconductance	V_{DS}=5V , I_D=0.38A		2.6		S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=10V , V_{GS}=4.5V , I_D=2.9A		4.0		nC
Q_{gs}	Gate-Source Charge[2,3]			0.65		
Q_{gd}	Gate-Drain Charge[2,3]			1.2		
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=10V , V_{GS}=4.5V , R_G=10Ω I_D=500mA		6.7		nS
T_r	Rise Time[2,3]			4.8		
$T_{d(off)}$	Turn-Off Delay Time[2,3]			17.3		
T_f	Fall Time[2,3]			7.4		
C_{iss}	Input Capacitance	V_{DS}=16V , V_{GS}=0V , F=1MHz		79		pF
C_{oss}	Output Capacitance			13		
C_{rss}	Reverse Transfer Capacitance			9		

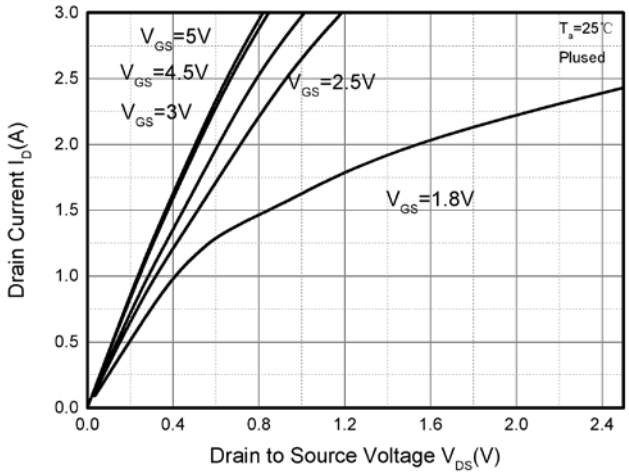
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode Forward Current				0.75	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=0.75A			1	V

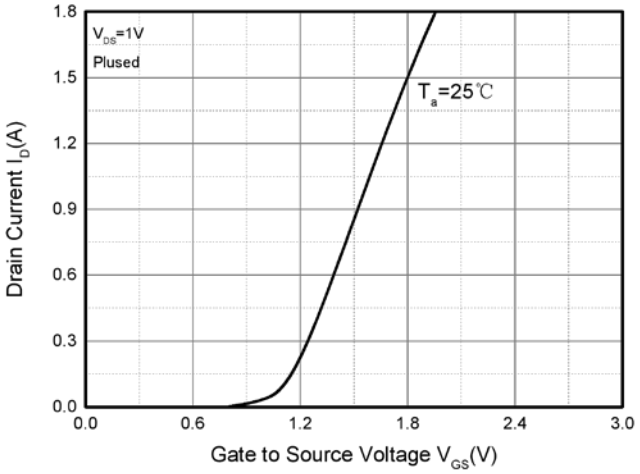
Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Characteristics

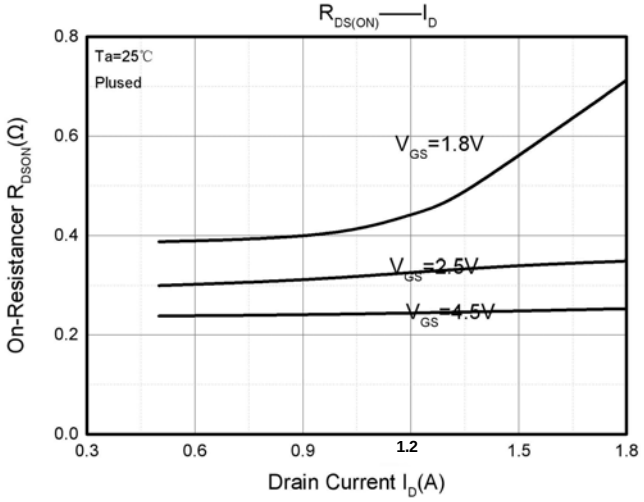
Output Characteristics



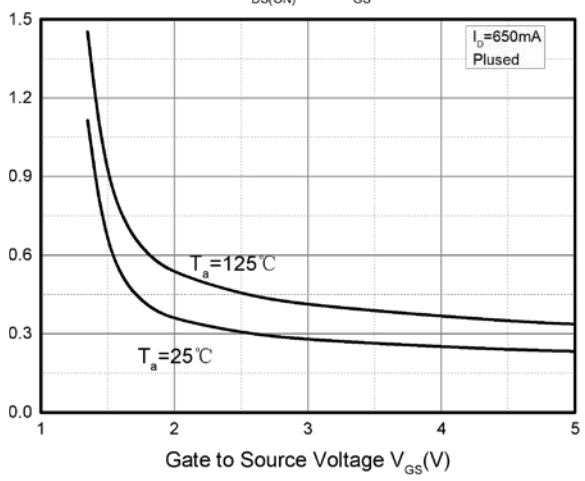
Transfer Characteristics



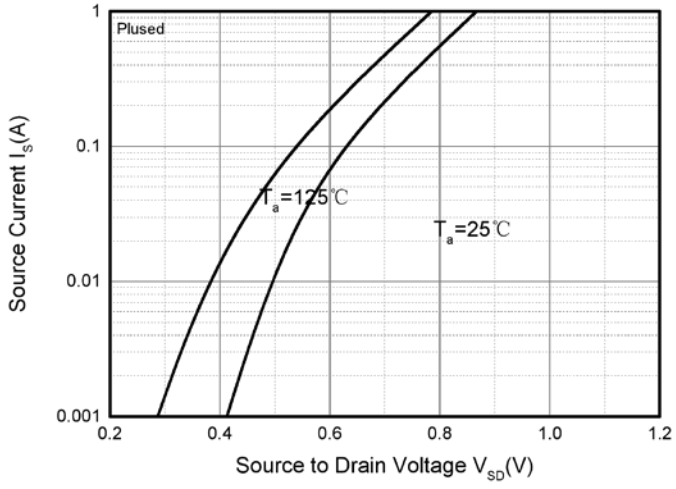
$R_{DS(ON)}$——I_D



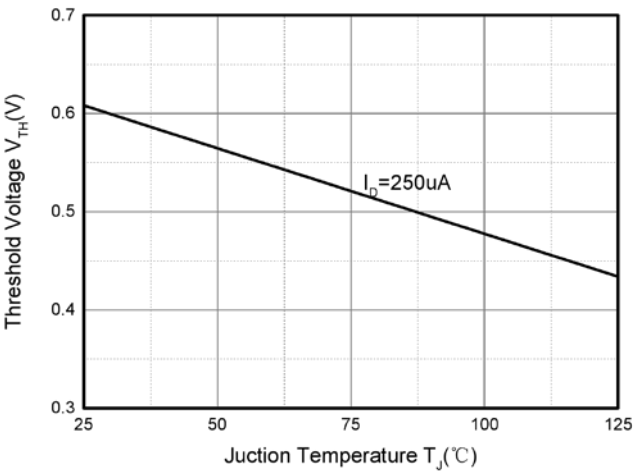
$R_{DS(ON)}$——V_{GS}



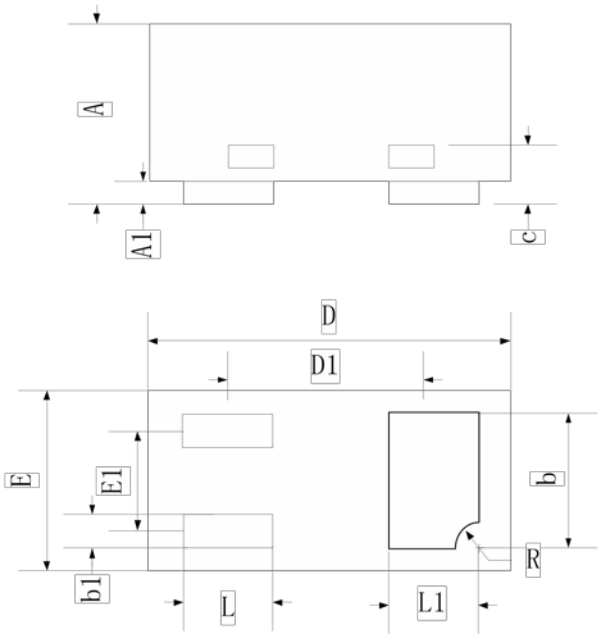
I_S——V_{SD}



Threshold Voltage

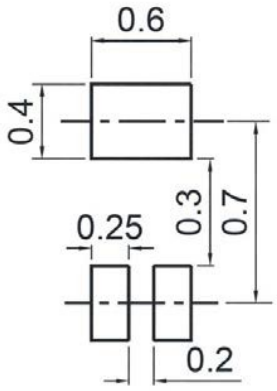


DFN1006-3 Package Information



Symbol	Dimensions in millimeters	
	Min.	Max.
A	0.45	0.50
A1	0	0.05
b	0.45	0.55
b1	0.10	0.20
c	0.08	0.18
D	0.95	1.05
D1	0.65	
E	0.55	0.65
E1	0.325	
L	0.20	0.30
L1	0.20	0.30
R	0.05	0.15

Recommended PCB Layout (Unit: mm)



DFN1006-3 Tape

DFN1006-3 Tape Leader and Trailer