

• General Description

The TF100N03L combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

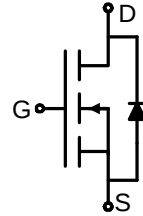
• Features

Advance high cell density Trench technology
Low $R_{DS(ON)}$ to minimize conductive loss
Low Gate Charge for fast switching
Low Thermal resistance

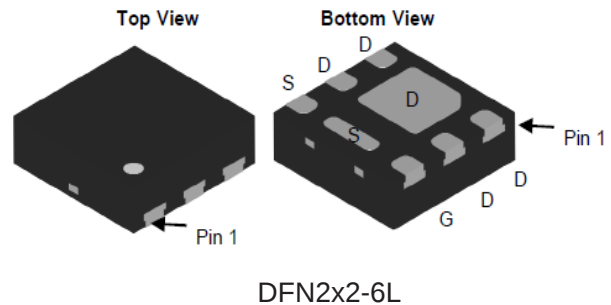
• Application

MB/VGA Vcore
SMPS 2nd Synchronous Rectifier
POL application
BLDC Motor driver

• Product Summary



$V_{DS} = 30V$ $I_D = 10A$
 $R_{DS(ON)}(10V \text{ typ}) = 12.0m\Omega$
 $R_{DS(ON)}(4.5V \text{ typ}) = 15.0m\Omega$



• Ordering Information:

Part NO.	TF100N03L
Marking1	1003:TF100N03L
Marking2	Y:year code; XX:Week; A:device code;
Basic ordering unit (pcs)	3000

• Absolute Maximum Ratings ($T_C = 25^\circ C$)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_{D@T_C=25^\circ C}$	10	A
	$I_{D@T_C=75^\circ C}$	7.0	A
	$I_{D@T_C=100^\circ C}$	6.0	A
Pulsed Drain Current ^①	I_{DM}	30	A
Total Power Dissipation ^②	$P_D@T_C=25^\circ C$	10	W
Total Power Dissipation	$P_D@T_A=25^\circ C$	1.0	W
Operating Junction Temperature	T_J	-55 to 150	$^\circ C$
Storage Temperature	T_{STG}	-55 to 150	$^\circ C$

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case ^②	R _{thJC}	-	-	7.0	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	59	° C/W
Soldering temperature, wavesoldering for 8s	T _{sold}	-	-	265	° C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250uA	30			V
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	1.0	1.5	2.2	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V			1.0	uA
Gate- Source Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
Static Drain-source On Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 6.0A		12.0	15.0	mΩ
		V _{GS} = 4.5V, I _D = 5.0A		15.0	18.0	mΩ
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D = 6.0A		10		S
Source-drain voltage	V _{SD}	I _S = 6.0A		0.86	1.00	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	f = 1MHz V _{DS} = 15V V _{GS} = 0V	-	625	-	pF
Output capacitance	C _{oss}		-	88.8	-	
Reverse transfer capacitance	C _{rss}		-	7.25	-	

●Gate Charge characteristics(T_a = 25°C)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q _g	V _{DD} = 15V I _D = 6.0A V _{GS} = 10V	-	15.5	-	nC
Gate - Source charge	Q _{gs}		-	3.28	-	
Gate - Drain charge	Q _{gd}		-	2.14	-	

Note:

① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

Fig.1 Gate-Charge Characteristics

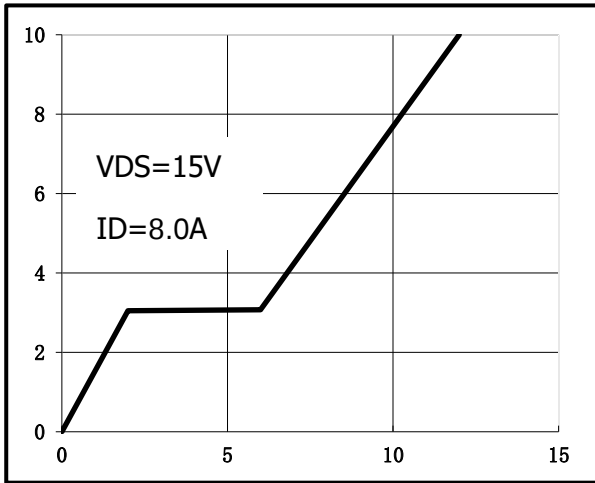


Fig.2 Capacitance Characteristics

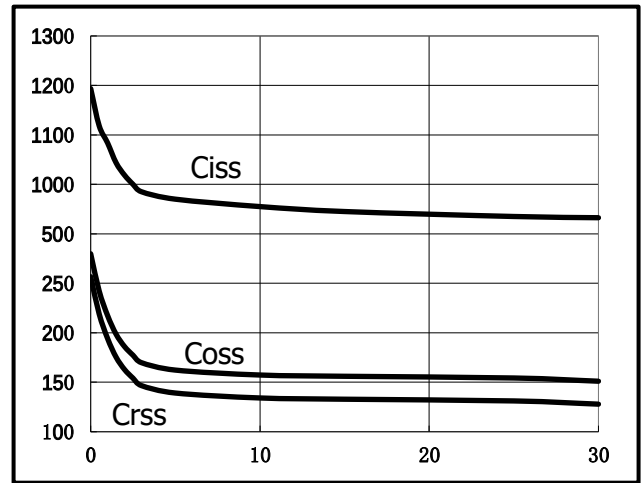


Fig.3 Power Dissipation Derating Curve

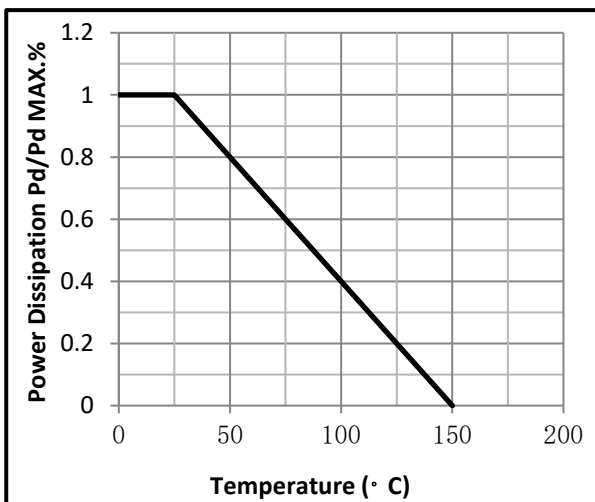


Fig.4 Typical output Characteristics

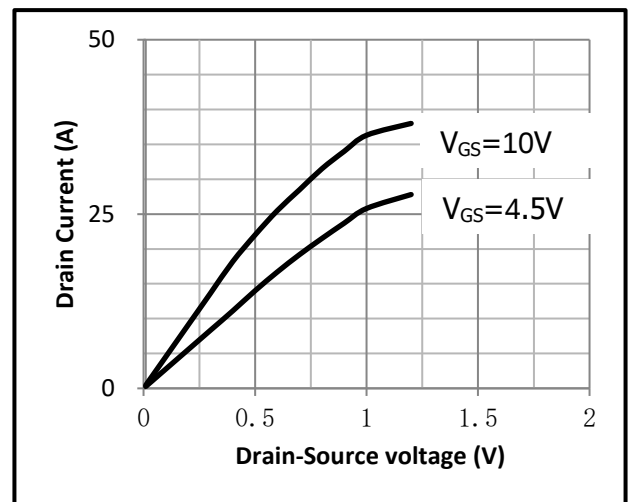


Fig.5 Threshold Voltage V.S Junction Temperature

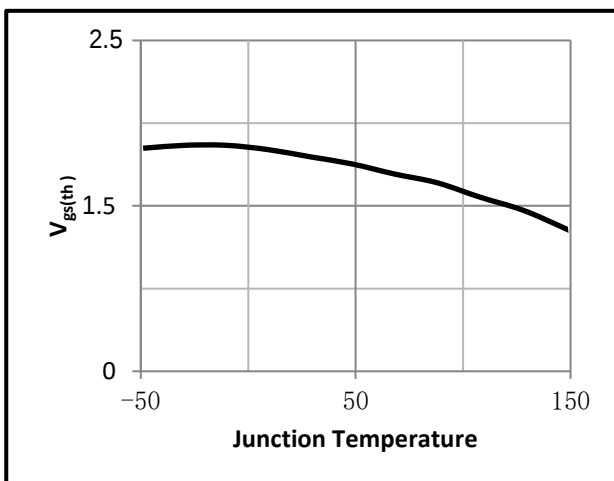


Fig.6 Resistance V.S Drain Current

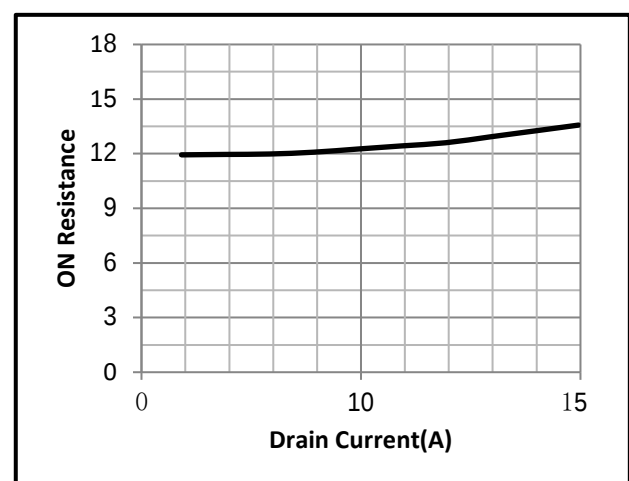


Fig.7 On-Resistance VS Gate Source Voltage

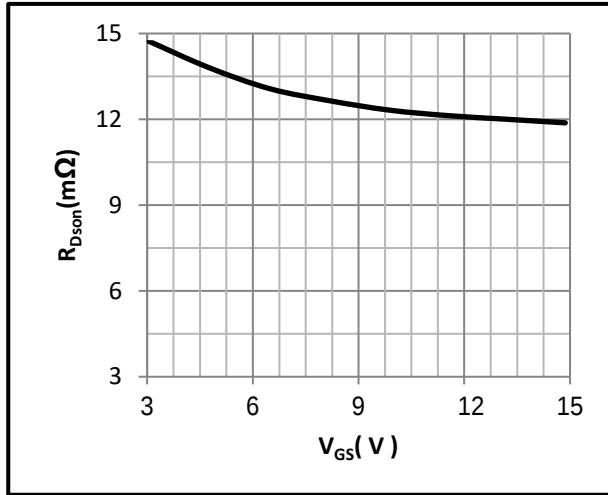


Fig.8 On-Resistance V.S Junction Temperature

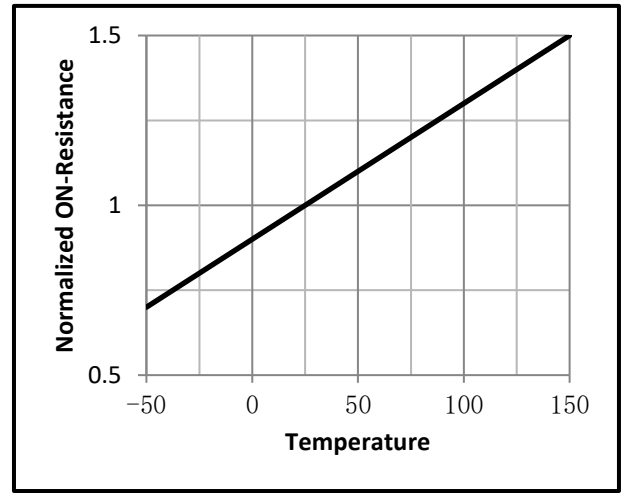


Fig.9 Switching Time Measurement Circuit

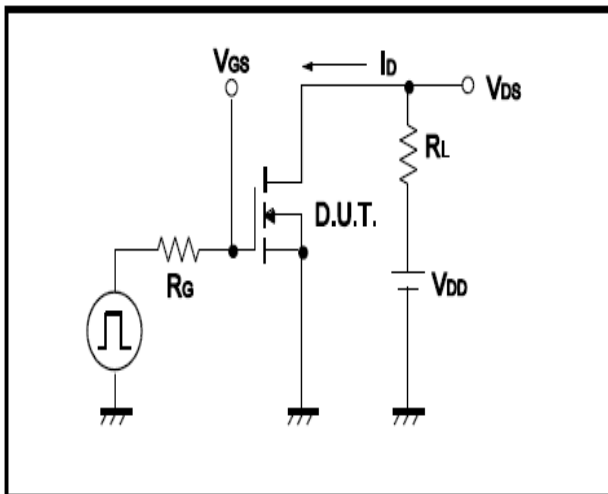


Fig.10 Gate Charge Waveform

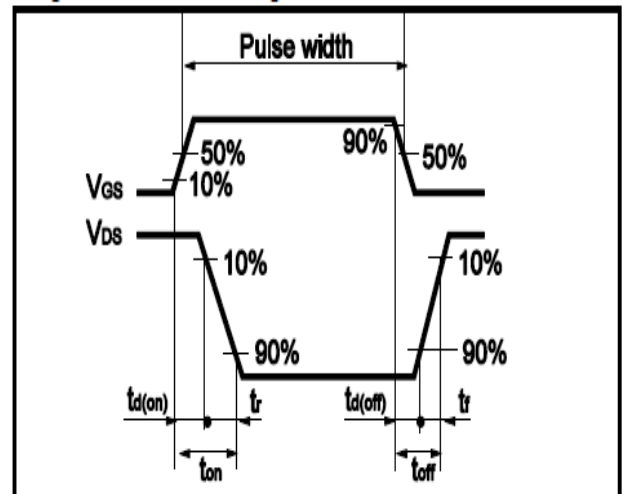


Fig.11 Avalanche Measurement Circuit

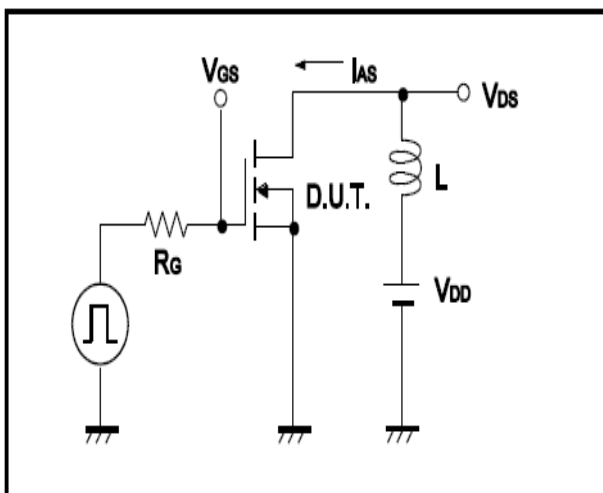
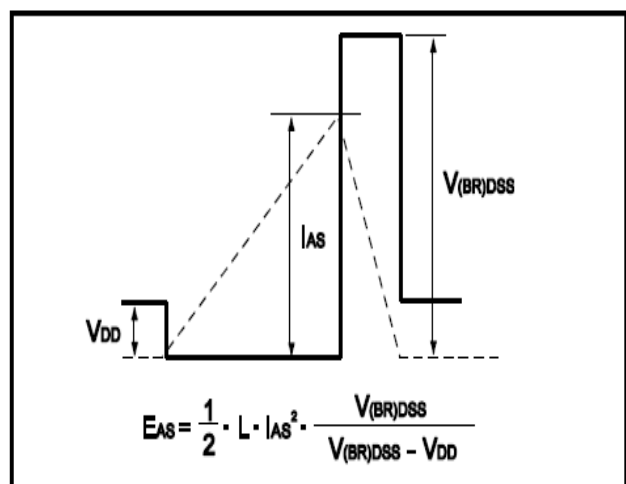
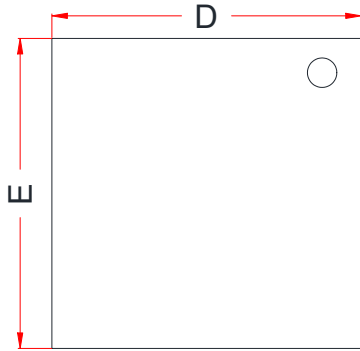


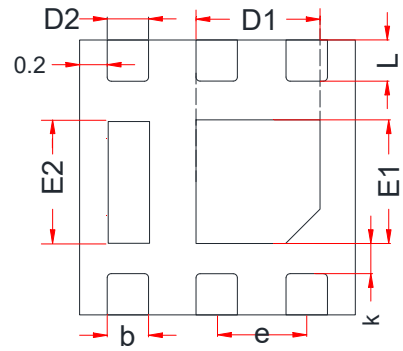
Fig.12 Avalanche Waveform



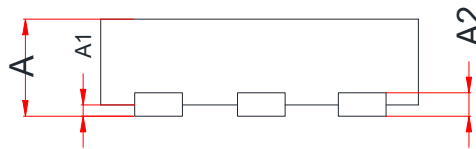
DFN2X2-6L Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2	0.203Ref.		
b	0.25	0.30	0.35
D	1.92	2.00	2.07
D1	0.85	0.95	1.05
D2	0.20	0.30	0.40
E	1.92	2.00	2.07
E1	0.70	0.80	0.90
E2	0.70	0.80	0.90
e	0.65 BSC		
L	0.30	0.35	0.40
K	0.20	-	-