

Description

The TFD120N03M uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other switching application.

General Feature

$V_{DS} = 30V$, $I_D = 10A$

$R_{DS(ON) Typ} = 11.5m\Omega @ V_{GS}=10V$

$R_{DS(ON) Typ} = 15.0m\Omega @ V_{GS}=4.5V$

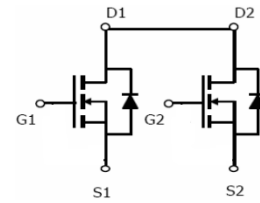
High Power and current handling capability Lead free product is acquired

Surface mount package

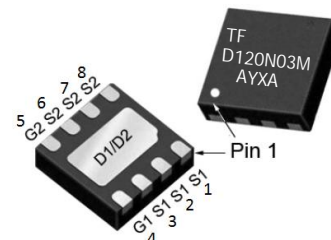
Application

Battery switch

DC/DC converter



Schematic diagram



DFN3030-8

Package Marking and Ordering Information:

Part NO.	TFD120N03M
Marking1	D120N03M: TFD120N03M
Marking2	TF:tuofeng; Y:year code; X:Week; AA:device code;
Basic ordering unit (pcs)	5000

Absolute Maximum Ratings (T_C =25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_D@TC=25^{\circ}C$	10	A
	$I_D@TC=75^{\circ}C$	7.0	A
	$I_D@TC=100^{\circ}C$	6.0	A
Pulsed Drain Current ①	I_{DM}	30	A
Total Power Dissipation	$P_D@TC=25^{\circ}C$	10	W
Total Power Dissipation	$P_D@TA=25^{\circ}C$	0.9	W
Operating Junction Temperature	T_J	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Single Pulse Avalanche Energy	E_{AS}	35	mJ



●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R _{thJC}	-	-	12.0	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	75	° C/W
Soldering temperature, wavesoldering for 8 s	T _{sold}	-	-	265	° C

●Electronic Characteristics(T_j=25 ,unless otherwise notse)

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	1.1	1.5	1.9	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30 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	-	11.5	14	mΩ
		V _{GS} =4.5V, I _D =4.0A	-	15.0	18	mΩ
Forward Transconductance	g _{FS}	V _{DS} =25V, I _D =5.0A	-	12	-	S
Source-drain voltage	V _{SD}	I _S =5.0A	-	-	1.20	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	f = 1MHz V _{DS} =15V V _{GS} =0V	-	595.0	-	pF
Output capacitance	C _{oss}		-	101.9	-	
Reverse transfer capacitance	C _{rss}		-	66.10	-	

●Gate Charge characteristics(T_a = 25°C)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q _g	V _{DD} = 20V	-	12.4	-	nC
Gate - Source charge	Q _{gs}	I _D = 6.0A	-	2.45	-	
Gate - Drain charge	Q _{gd}	V _{GS} = 10V	-	1.58	-	

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

Typical Electrical and Thermal Characteristics

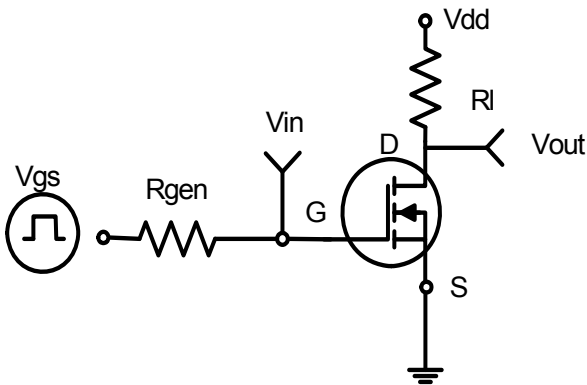


Figure 1 Switching Test Circuit

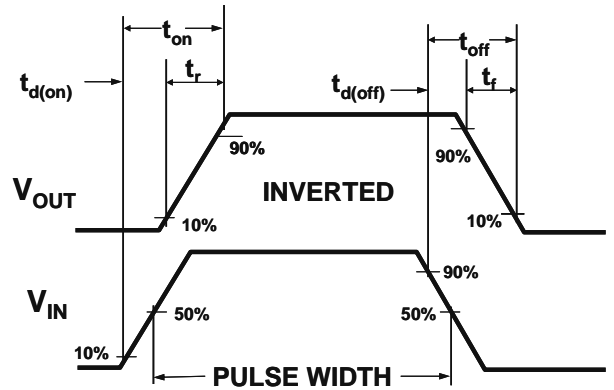


Figure 2 Switching Waveforms

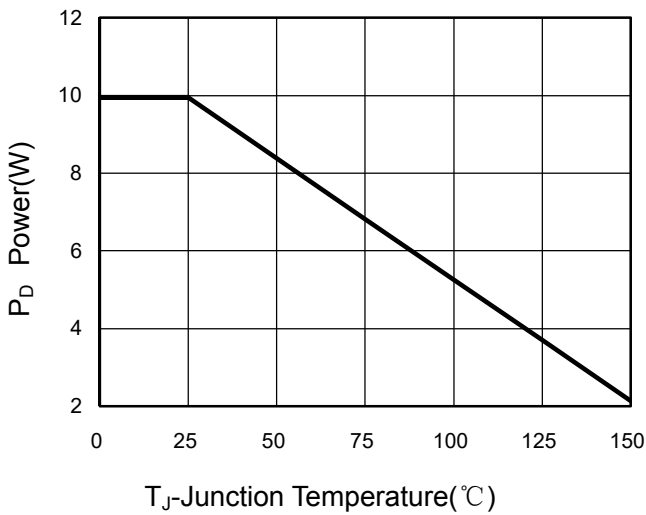


Figure 3 Power Dissipation

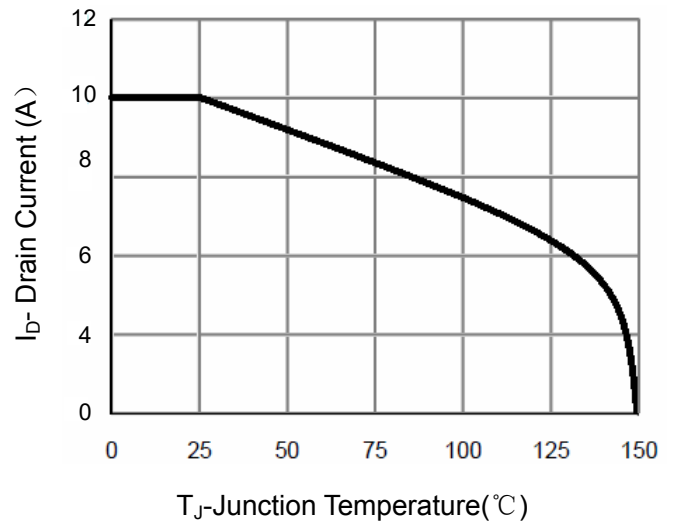


Figure 4 Drain Current

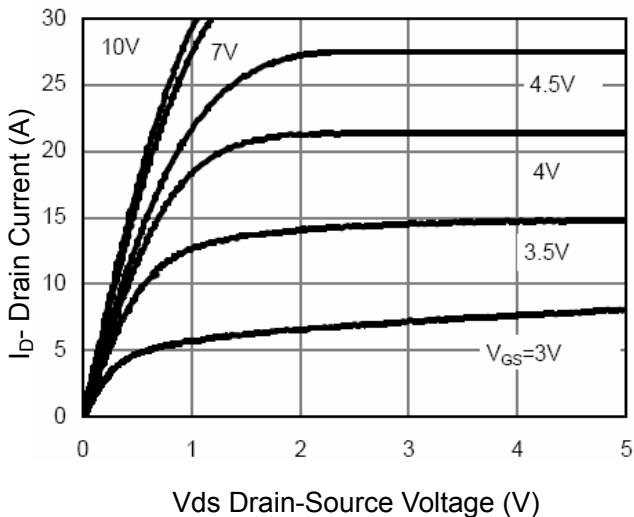


Figure 5 Output Characteristics

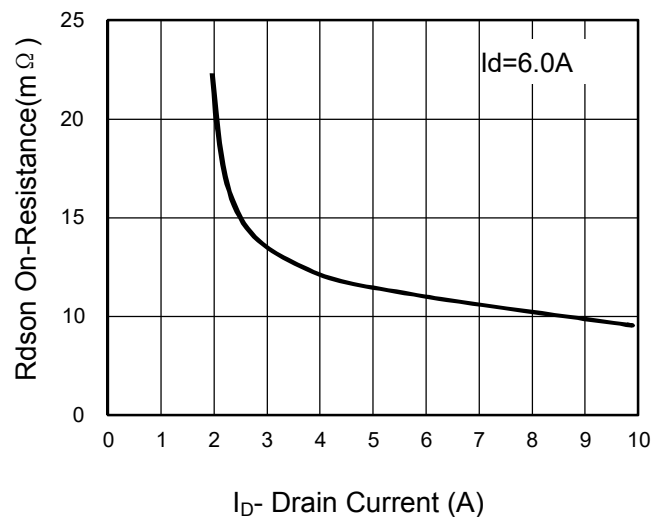


Figure 6 Drain-Source On-Resistance

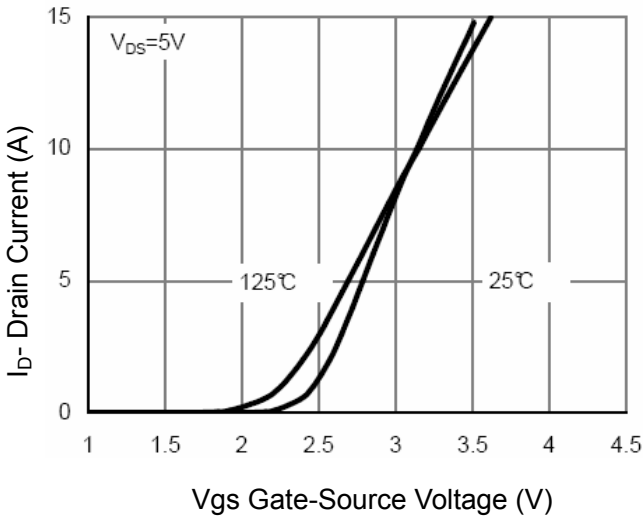


Figure 7 Transfer Characteristics

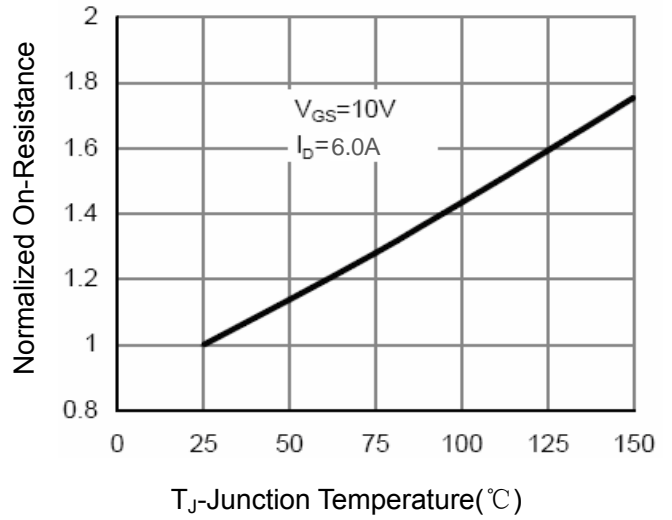


Figure 8 Drain-Source On-Resistance

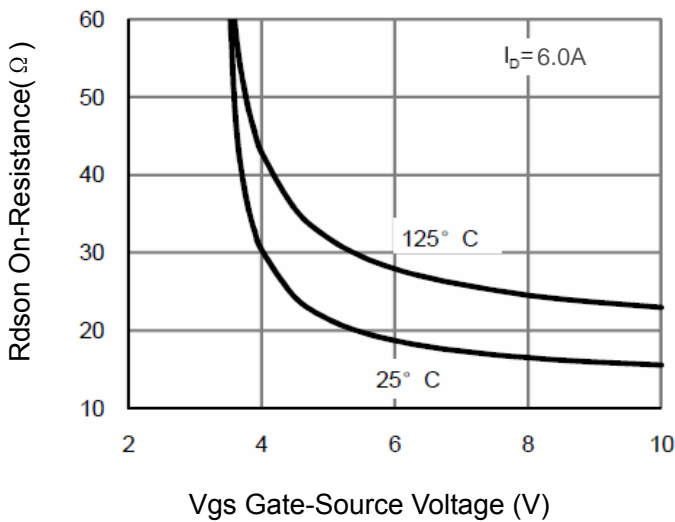


Figure 9 Rdson vs Vgs

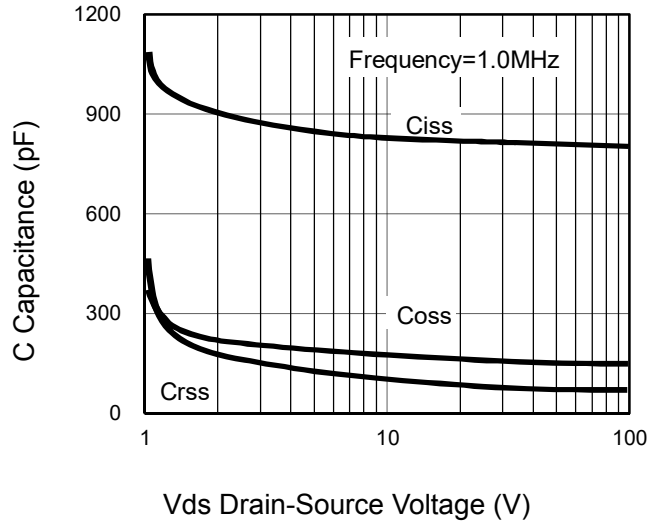


Figure 10 Capacitance vs Vds

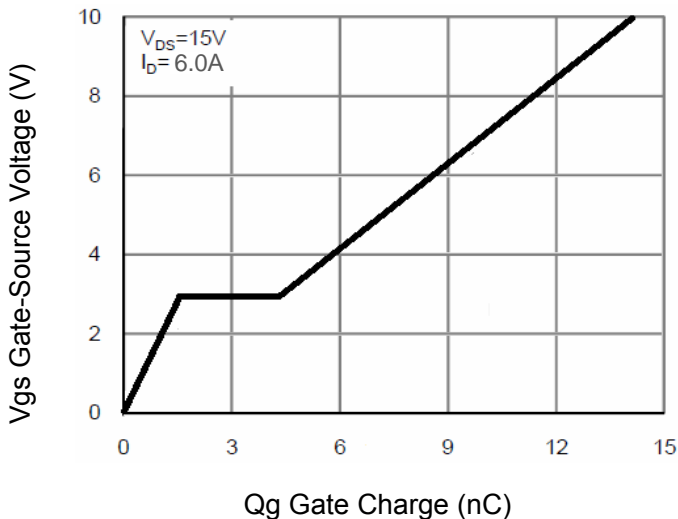


Figure 11 Gate Charge

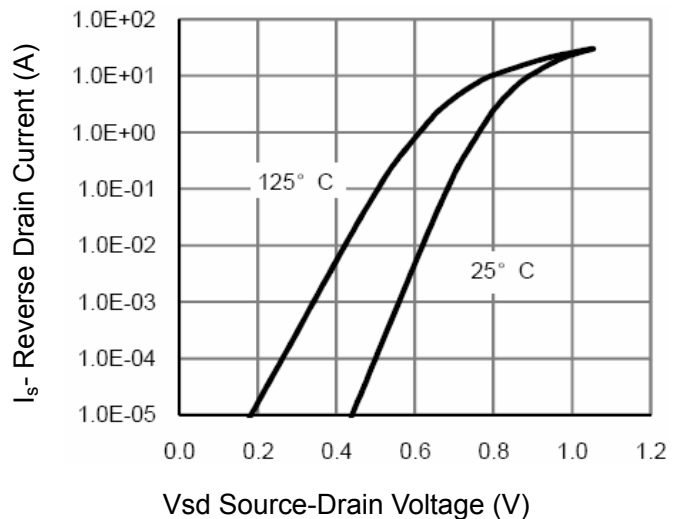


Figure 12 Source- Drain Diode Forward

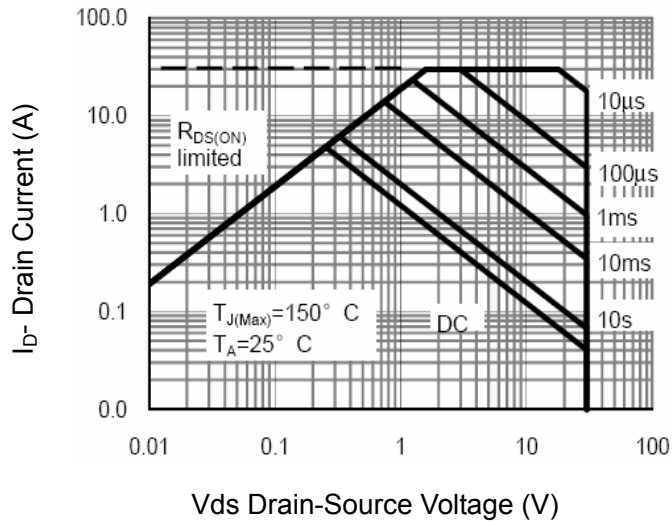


Figure 13 Safe Operation Area

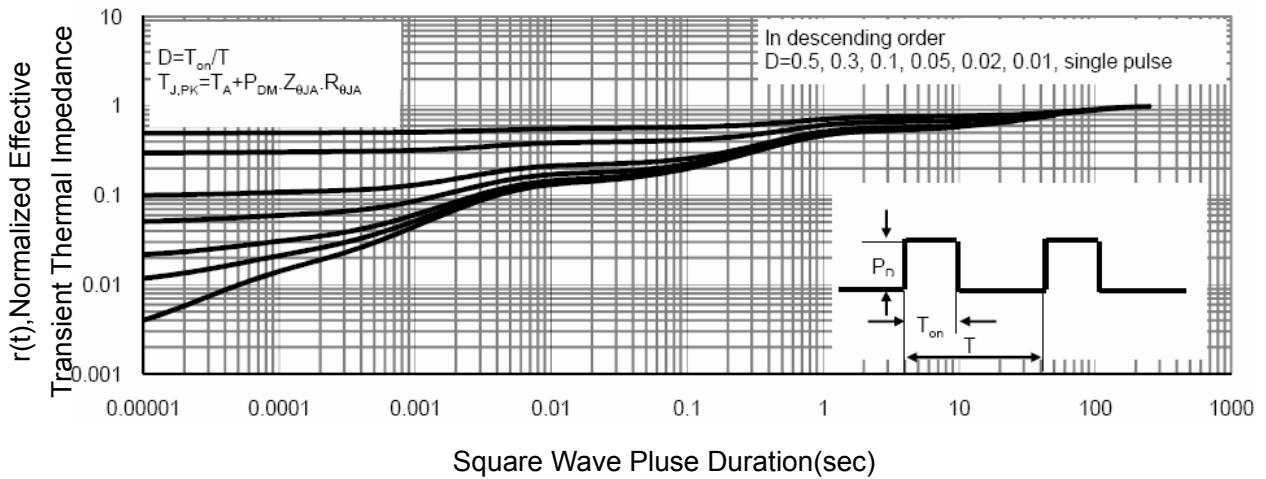


Figure 14 Normalized Maximum Transient Thermal Impedance

DFN3×3 Package Outline Data

