

General Description

The TF3107 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

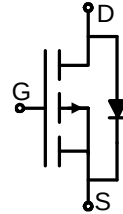
Features

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

Application

Load Switches
Power management
Battery protection
BLDC Motor driver

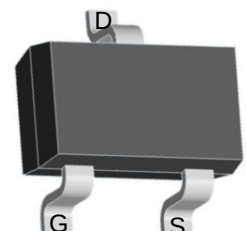
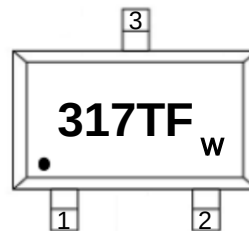
Product Summary



$$V_{DS} = -30V \quad I_D = -7.0A$$

$$R_{DS(ON)}(-10V \text{ typ}) = 18.5m\Omega$$

$$R_{DS(ON)}(-4.5V \text{ typ}) = 24.5m\Omega$$



SOT23-3L

Ordering Information:

Part NO.	TF3107
Marking1	317:TF3107; TF:tuofeng
Marking2	W:Week
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	$I_{D@T_C=25^\circ C}$	-7.0	A
	$I_{D@T_C=75^\circ C}$	-5.0	A
	$I_{D@T_C=100^\circ C}$	-4.0	A
Pulsed Drain Current ^①	I_{DM}	-23	A
Total Power Dissipation ^②	$P_D@T_C=25^\circ C$	1.5	W
Total Power Dissipation	$P_D@T_A=25^\circ C$	0.2	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}	-	-	10	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	68	° 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	-1.9	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 = -7.0A		18.5	25.0	mΩ
		V _{GS} = -4.5V, I _D = -5.0A		24.5	35.0	mΩ
Forward Transconductance	g _{FS}	V _{DS} = -10V, I _D = -5.0A		10		S
Source-drain voltage	V _{SD}	I _S = -7.0A		0.83	1.00	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	V _{DS} = -15V, V _{GS} = 0V f = 1MHz	-	1500	-	pF
Output capacitance	C _{oss}		-	327	-	
Reverse transfer capacitance	C _{rss}		-	276	-	

●Gate Charge characteristics(T_a = 25°C)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q _g	V _{DD} = -15V	-	30.0	-	nC
Gate - Source charge	Q _{gs}	I _D = -7.0A	-	5.30	-	
Gate - Drain charge	Q _{gd}	V _{GS} = -10V	-	7.60	-	

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 Power Dissipation Derating Curve

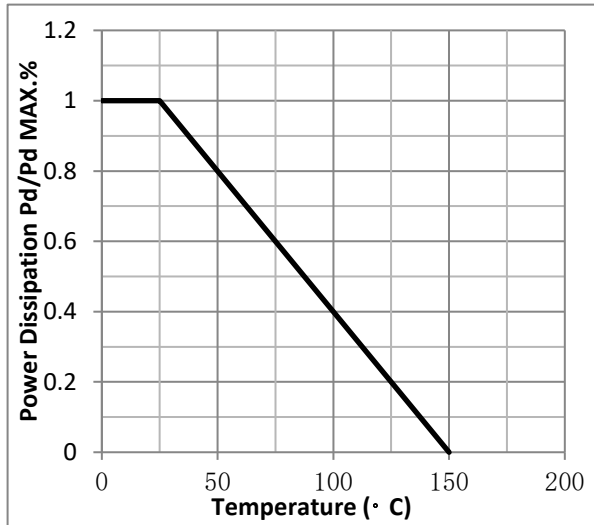


Fig.2 Typical output Characteristics

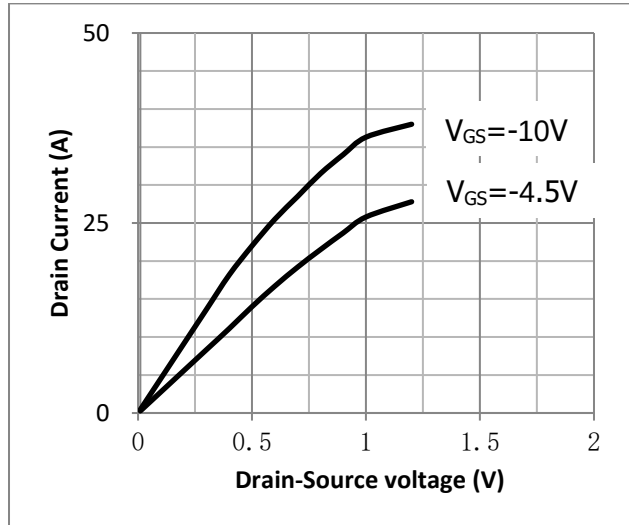


Fig.3 Threshold Voltage V.S Junction Temperature

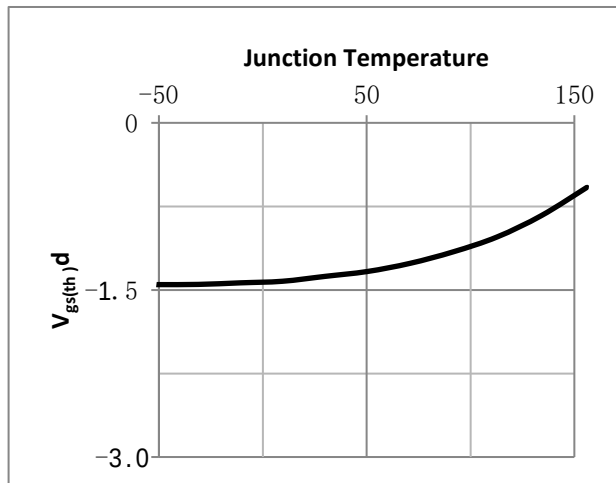


Fig.4 Resistance V.S Drain Current

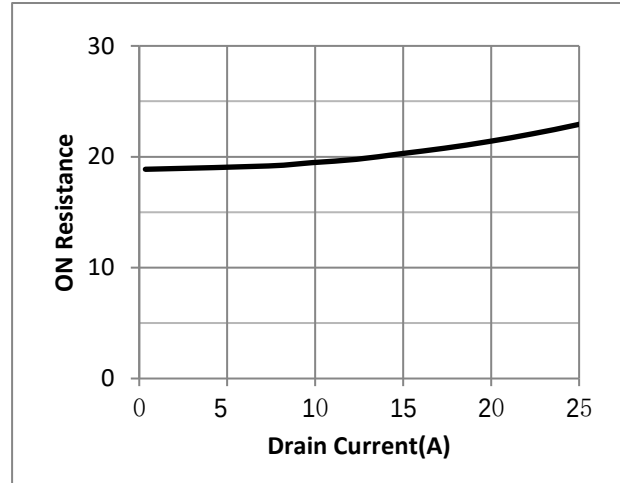


Fig.5 On-Resistance VS Gate Source Voltage

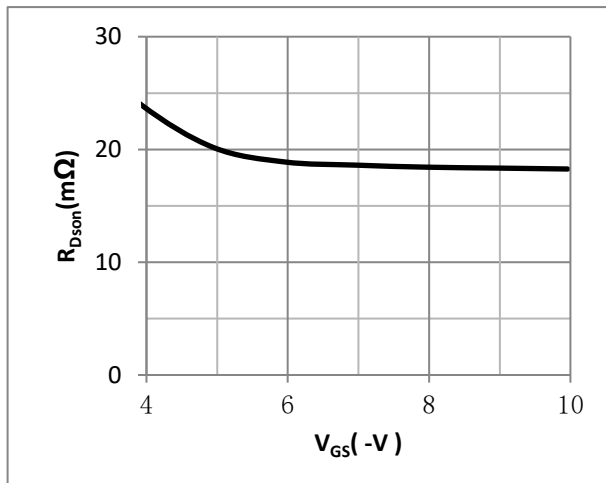


Fig.6 On-Resistance V.S Junction Temperature

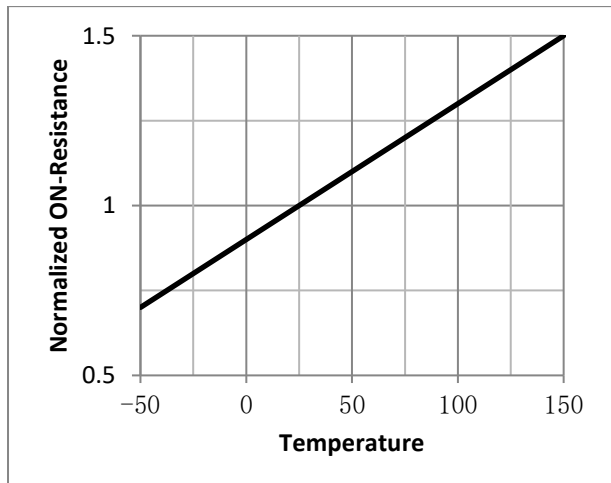


Fig.7 Switching Time Measurement Circuit

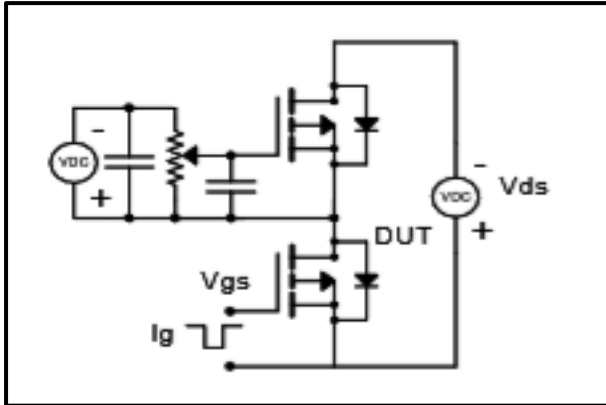


Fig.8 Gate Charge Waveform

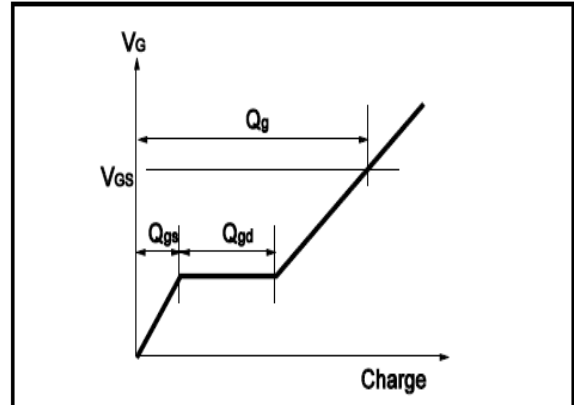


Fig.9 Switching Time Measurement Circuit

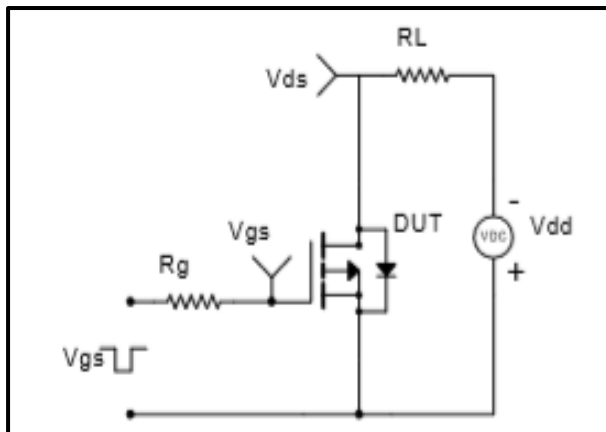


Fig.10 Gate Charge Waveform

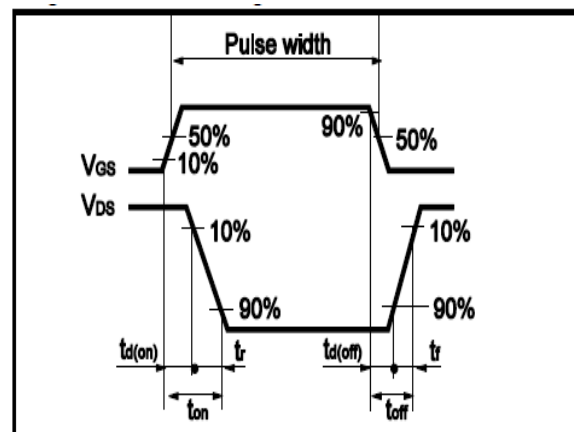


Fig.11 Avalanche Measurement Circuit

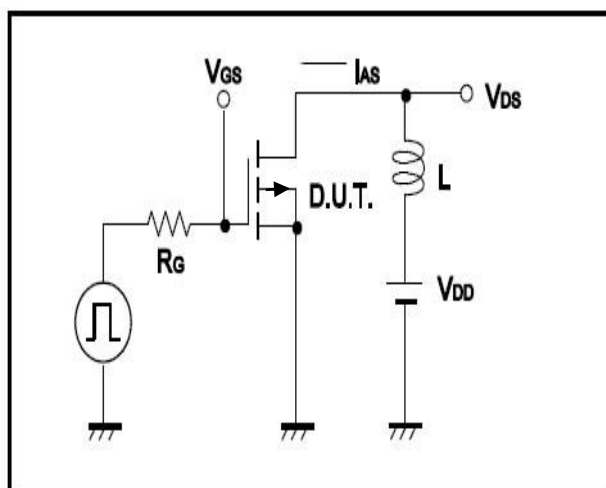
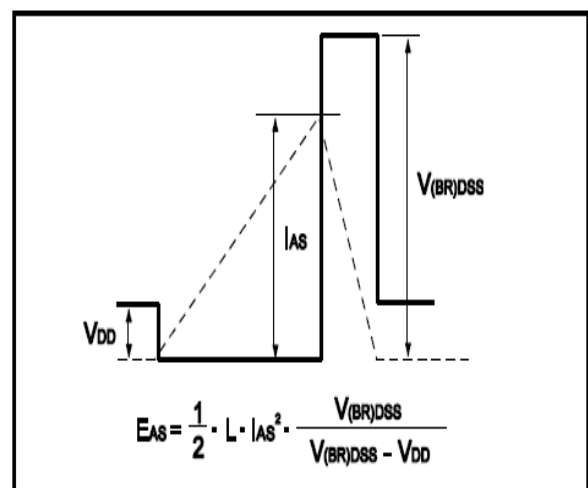
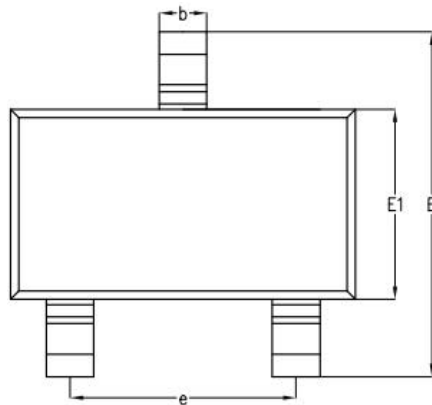
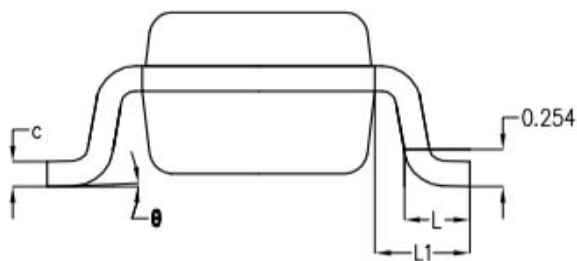
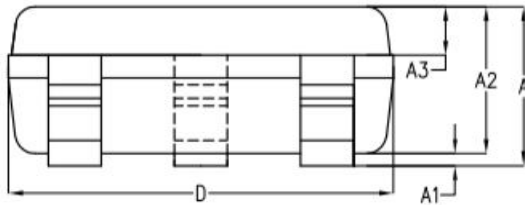


Fig.12 Avalanche Waveform



SOT23-3L



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	1.19	1.24
A1	—	0.05	0.09
A2	1.05	1.10	1.15
A3	0.31	0.36	0.41
b	0.35	0.40	0.45
c	0.12	0.17	0.22
D	2.85	2.90	2.95
E	2.80	2.90	3.00
E1	1.55	1.60	1.65
e	1.90BSC		
L	0.37	0.45	0.53
L1	0.65BSC		
θ	0°	2°	8°