

● **General Description**

The TF130N10MG uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.

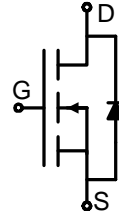
● **Features**

- Advance device constructure
- Low R_{DS(ON)} to minimize conduction loss
- Low Gate Charge for fast switching
- Low Thermal resistance

● **Application**

- Synchronous Rectification for AC-DC/DC-DC converter
- Power Tools

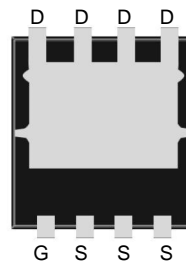
● **Product Summary**



V_{DS} = 100V I_D = 40A

R_{DS(ON)(10V typ)} = 11mΩ

R_{DS(ON)(4.5V typ)} = 14mΩ



PDFN3333-8L

● **Package Marking and Ordering Information:**

Part NO.	TF130N10MG
Marking1	130N10MG
Marking2	TF:tuofeng; AA:device code; Y:year code; X:Week
Basic ordering unit	5000 / PCS

● **Absolute Maximum Ratings** (T_C = 25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _{D@TC=25°C}	40	A
	I _{D@TC=75°C}	28	A
	I _{D@TC=100°C}	18	A
Pulsed Drain Current ①	I _{DM}	160	A
Total Power Dissipation	P _{D@TC=25°C}	48	W
Total Power Dissipation	P _{D@TA=25°C}	1.0	W
Operating Junction Temperature	T _J	-55 to 150	°C
Storage Temperature	T _{STG}	-55 to 150	°C
Single Pulse Avalanche Energy	E _{AS}	50	mJ



●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R _{thJC}	-	-	6.0	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	60	° C/W
Soldering temperature, wavesoldering for 8 s	T _{sold}	-	-	260	° C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	100	-	-	V
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250uA	1.2	1.8	2.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100 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 =15A	-	11	17	mΩ
		V _{GS} =4.5V, I _D =10A	-	14	24	mΩ
Forward Transconductance	g _{FS}	V _{DS} =25V, I _D =15A	-	15	-	S
Source-drain voltage	V _{SD}	I _S =15A	-	-	1.20	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	f = 1MHz V _{DS} =50V	-	1130	-	pF
Output capacitance	C _{oss}		-	430	-	
Reverse transfer capacitance	C _{rss}		-	5.8	-	

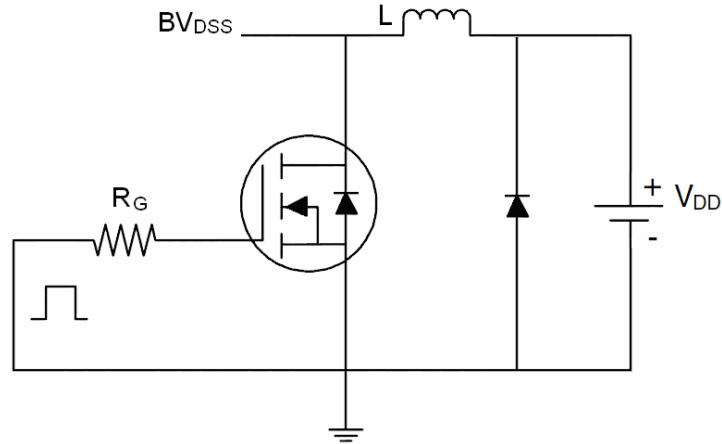
●Gate Charge characteristics(T_a = 25°C)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q _g	V _{DD} = 50V	-	15.5	-	nC
Gate - Source charge	Q _{gs}	I _D = 10A	-	4.0	-	
Gate - Drain charge	Q _{gd}	V _{GS} = 10V	-	1.9	-	

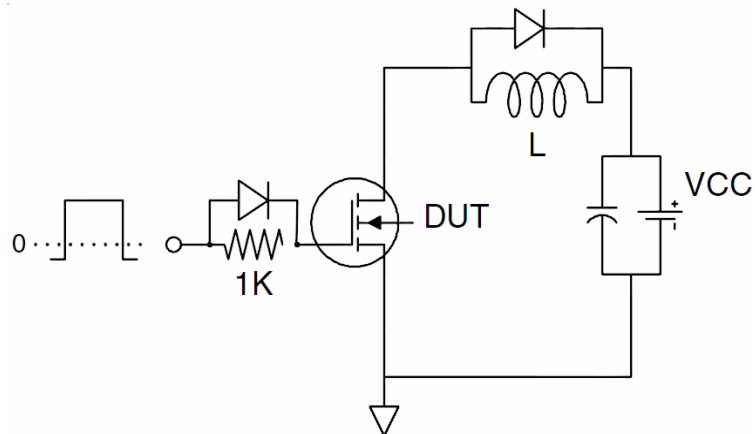
Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

Test Circuit

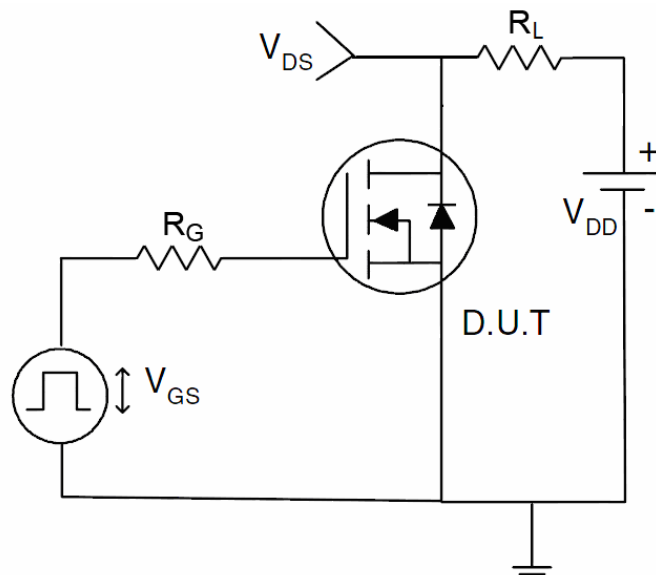
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics

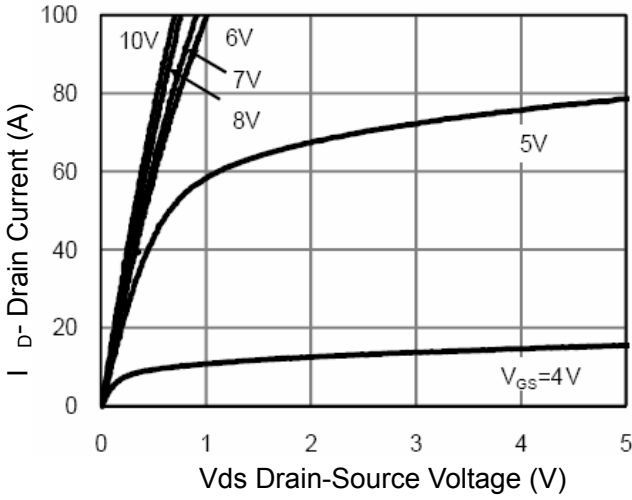


Figure 1 Output Characteristics

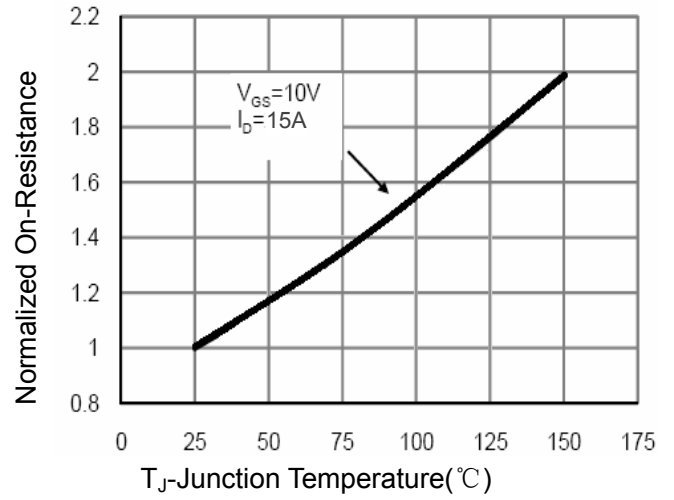


Figure 4 Rdson-Junction Temperature

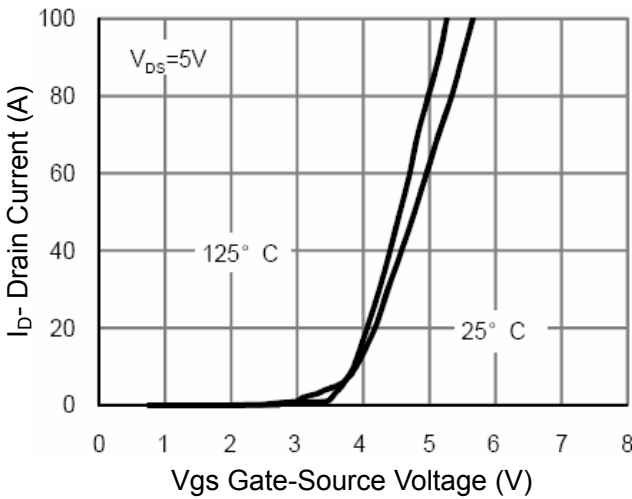


Figure 2 Transfer Characteristics

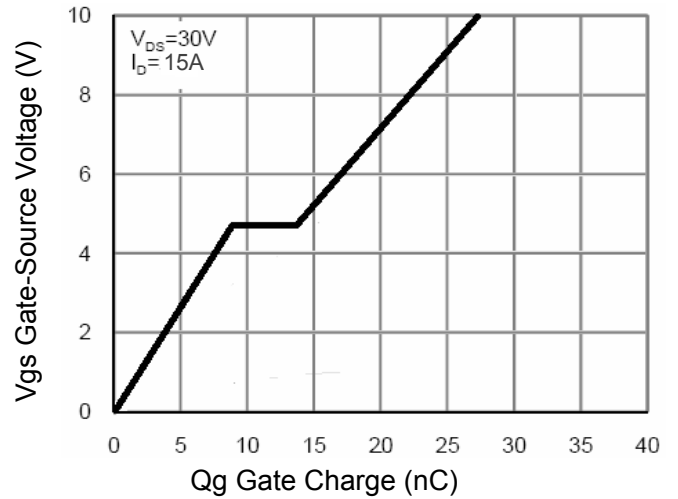


Figure 5 Gate Charge

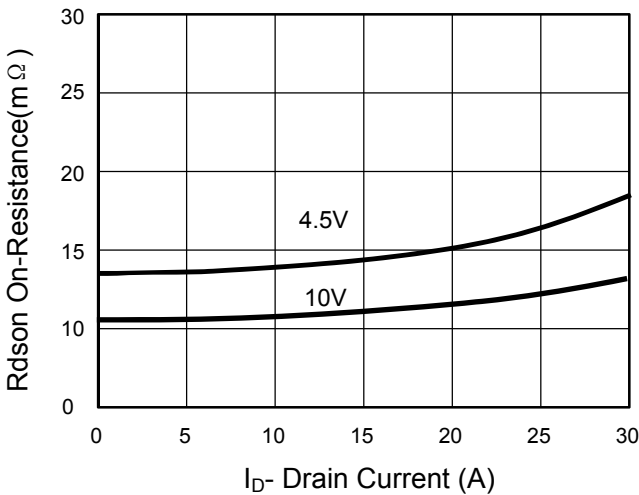


Figure 3 Rdson- Drain Current

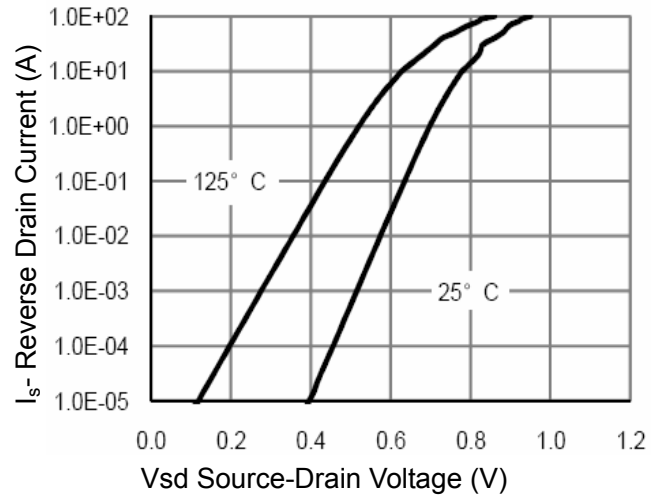


Figure 6 Source- Drain Diode Forward

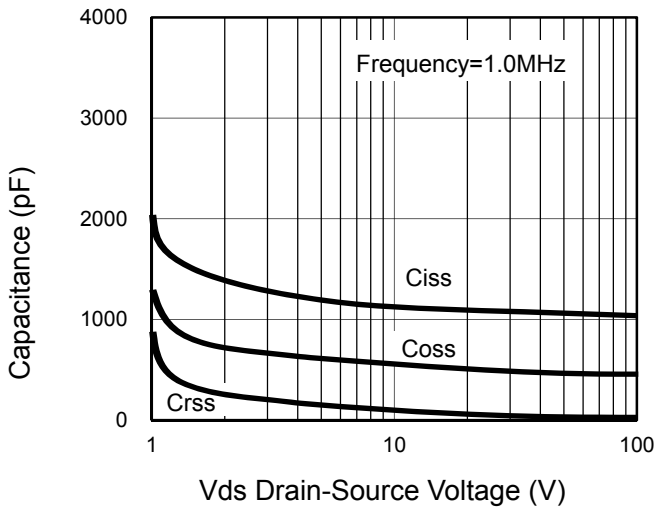


Figure 7 Capacitance vs Vds

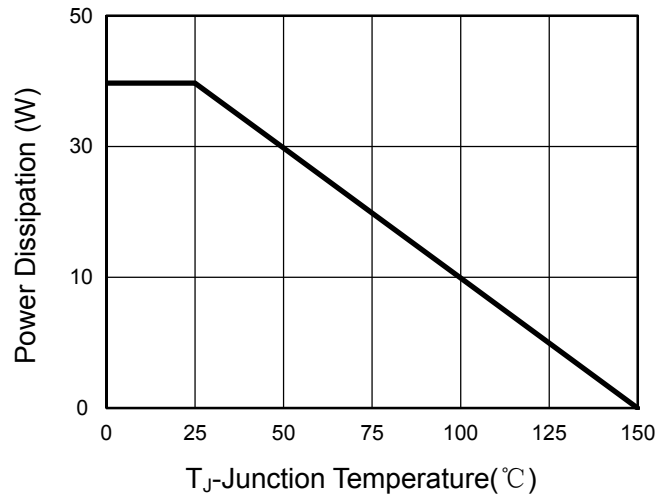


Figure 9 Power De-rating

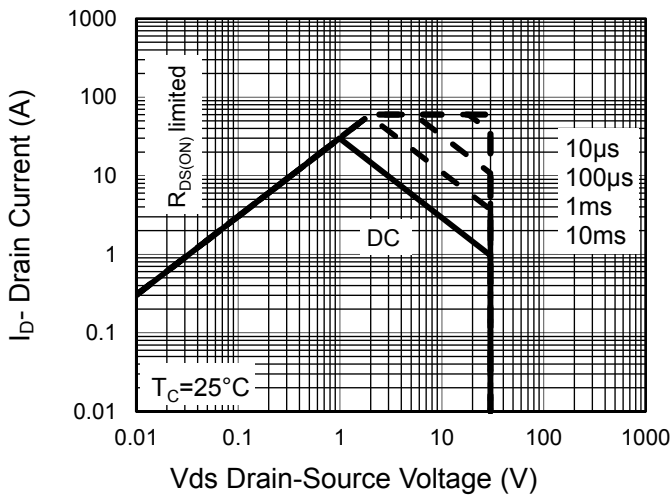


Figure 8 Safe Operation Area

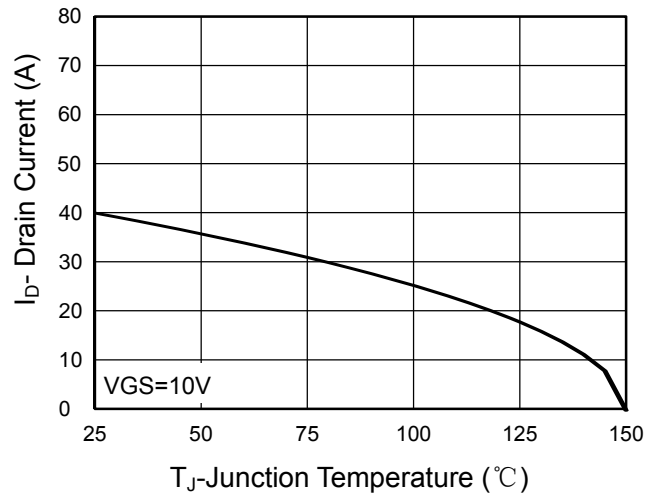


Figure 10 Current De-rating

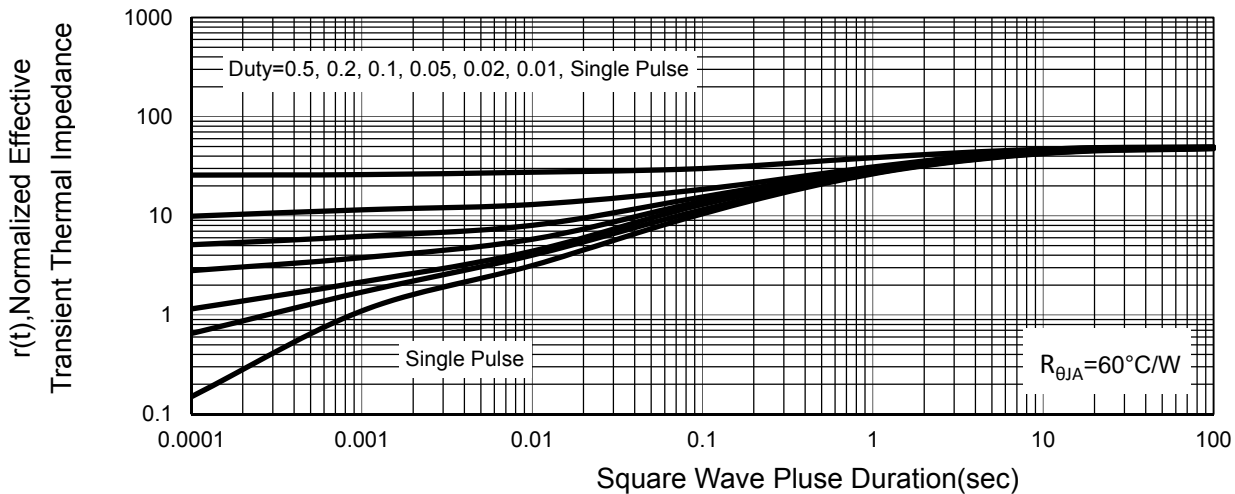
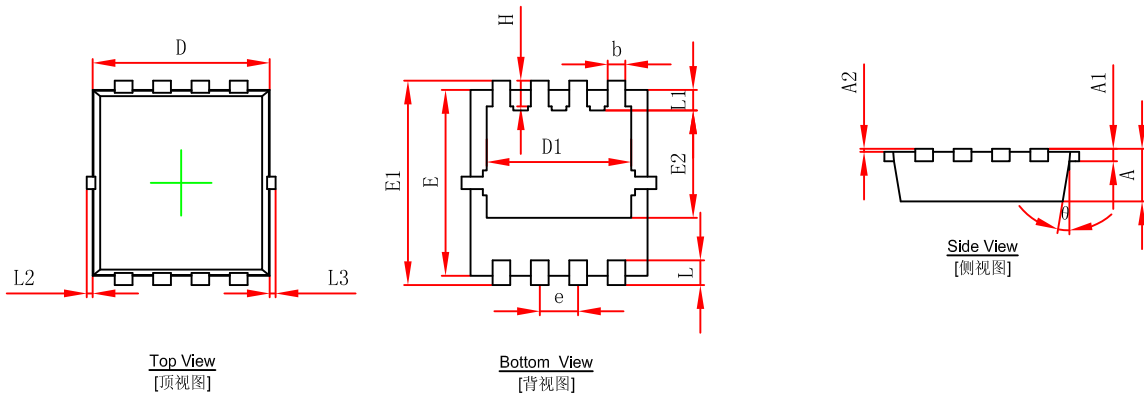


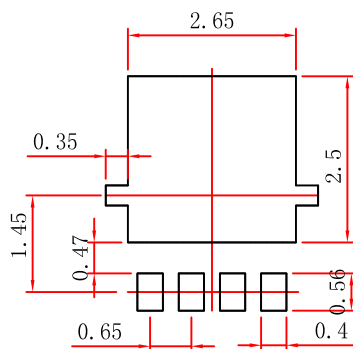
Figure 11 Normalized Maximum Transient Thermal Impedance

PDFN3333-8L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

PDFN3333-8L Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.