N-CHANNEL ENHANCEMENT MODE POWER MOSFET

SGT MOS、低内阻、低结电容开关损耗小 **TFD150N03MG**

● General Description

The TFD150N03MG combines advanced trench MOSFET technology with a low resistance package to provide extremely low RDS(ON). This device is ideal for load switch and battery protection applications.

● Features

Advance high cell density Trench technology

Low RDS(ON) to minimize conductive loss

Low Gate Charge for fast switching

Dual DIE in one package

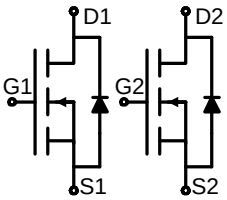
●Application

Power Management in Notebook Computer,

Portable Equipment and Battery

Powered Systems

● Product Summary

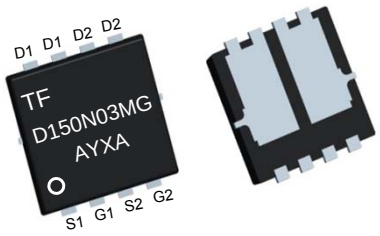


V_{DS}=30V I_D=20A

$R_{DS(10v\ typ)}$ = 14mΩ

$R_{DS(4.5v\ typ)}$ = 24mΩ

RoHS compliant



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●Package Marking and Ordering Information:

Part NO.	TFD150N03MG
Marking1	D150N03MG:TFD150N03MG
Marking2	TF:tuofeng; Y:year code; X:Week; AA:device code;
Basic ordering unit (pcs)	5000

●Absolute Maximum Ratings (T_C =25℃)

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℃	20	A
	$I_{D@}$TC=75℃	14	A
	$I_{D@}$TC=100℃	12	A
Pulsed Drain Current ①	I_{DM}	50	A
Total Power Dissipation	P_D@TC=25℃	35	W
Total Power Dissipation	P_D@TA=25℃	1.2	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	30	mJ

●**Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	4.5	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	68	°C/W
Soldering temperature, wavesoldering for 8 s	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	1.7	2.0	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=8A	-	14	18	mΩ
		V_{GS}=4.5V, I_D=6A	-	24	27	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=8A	-	8	-	S
Source-drain voltage	V_{SD}	Is=8A	-	-	1.20	V

●**Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz V_{DS}=20V V_{GS}=0V	-	300	-	pF
Output capacitance	Coss		-	65	-	
Reverse transfer capacitance	Crss		-	60	-	

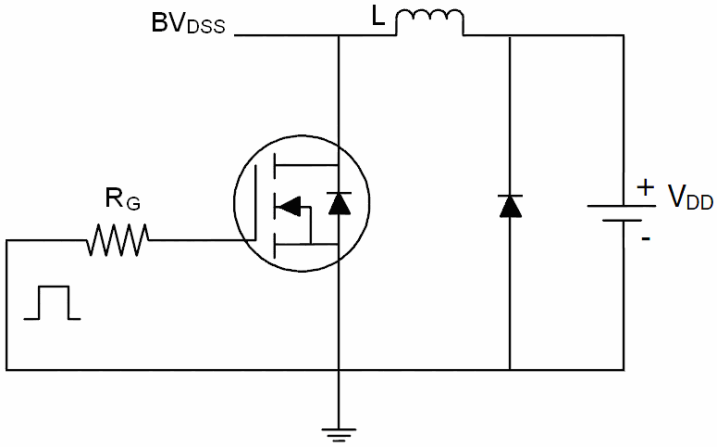
●**Gate Charge characteristics**(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Qg	V_{DD} = 20V I_D = 8A V_{GS} = 10V	-	11.1	-	nC
Gate - Source charge	Qgs		-	2.07	-	
Gate - Drain charge	Qgd		-	2.34	-	

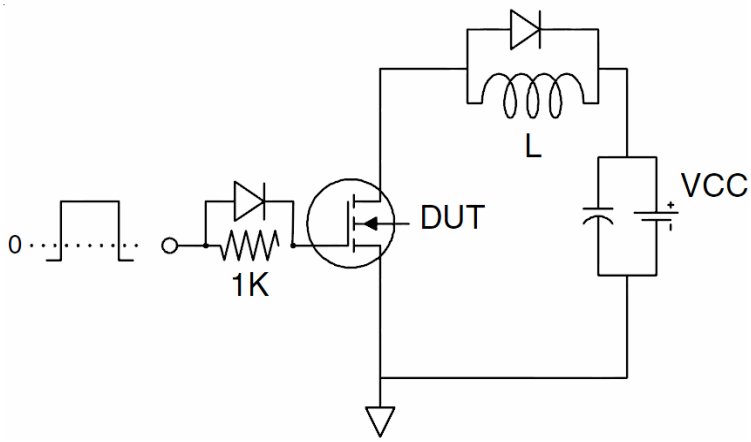
Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

Test Circuit

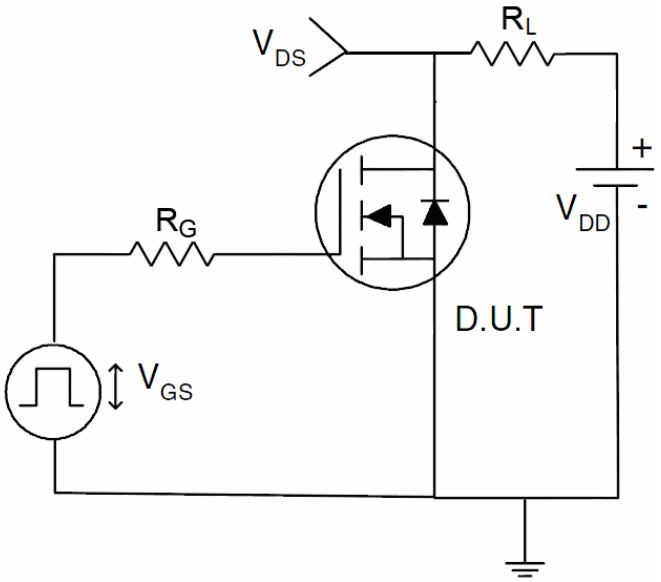
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics

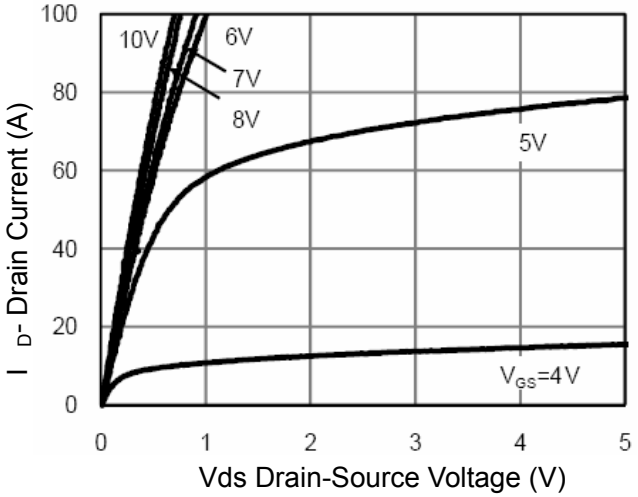


Figure 1 Output Characteristics

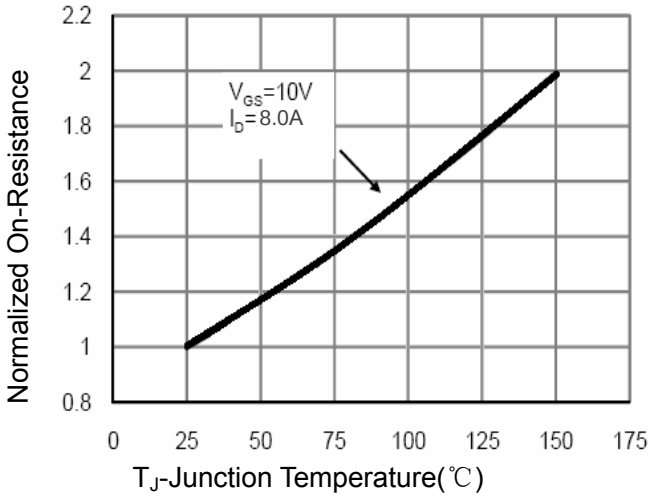


Figure 4 Rdson-JunctionTemperature

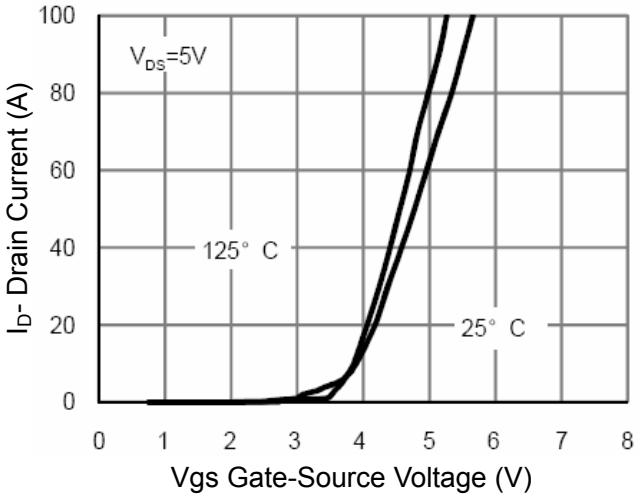


Figure 2 Transfer Characteristics

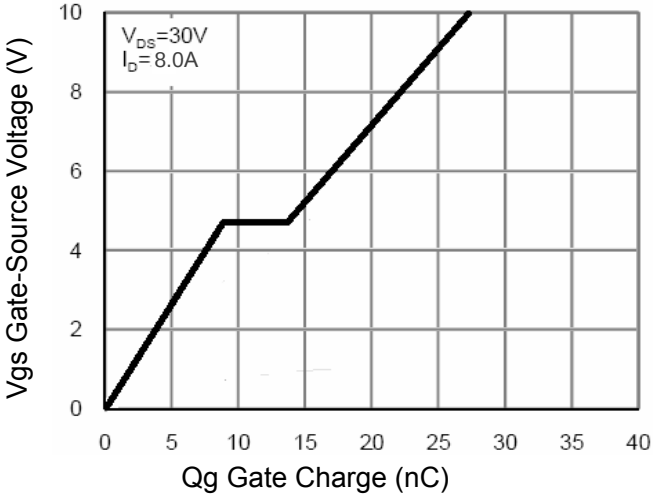


Figure 5 Gate Charge

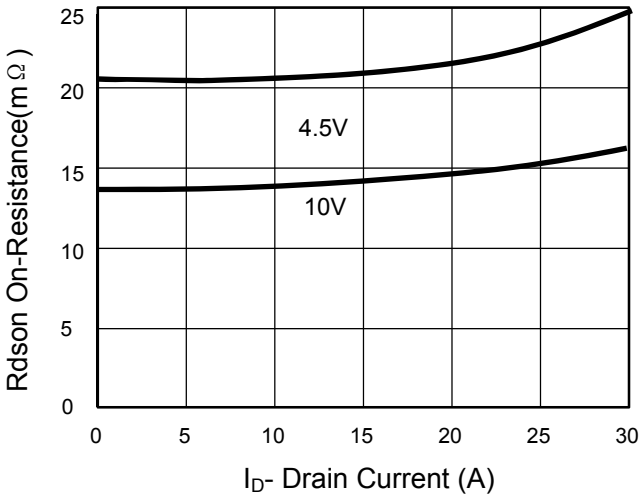


Figure 3 Rdson- Drain Current

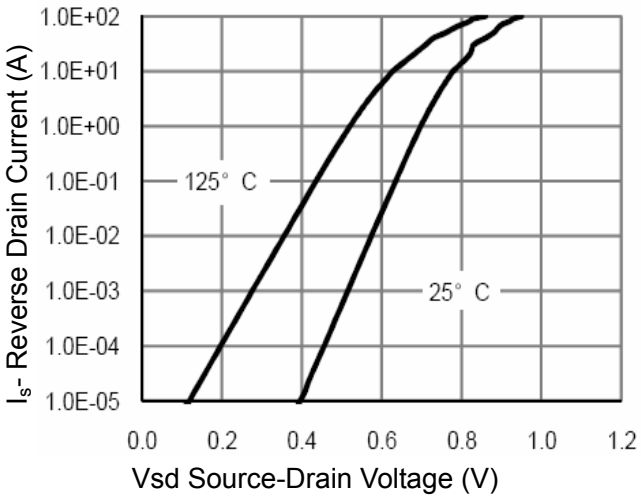


Figure 6 Source- Drain Diode Forward

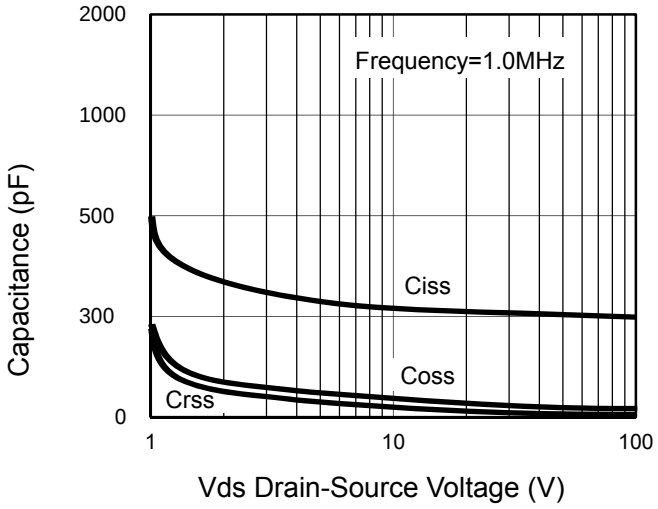


Figure 7 Capacitance vs Vds

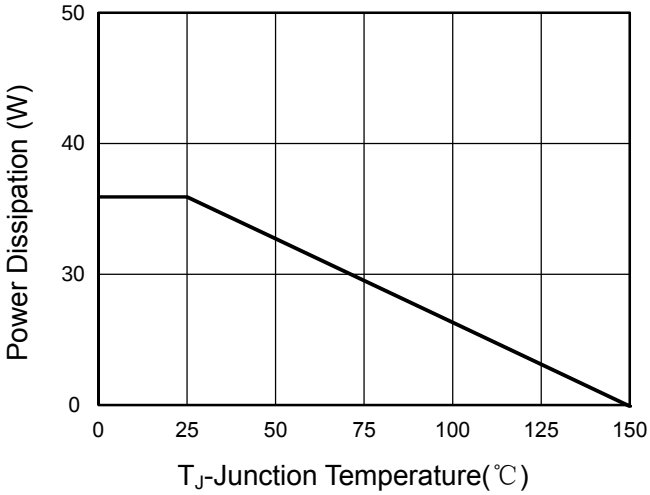


Figure 9 Power De-rating

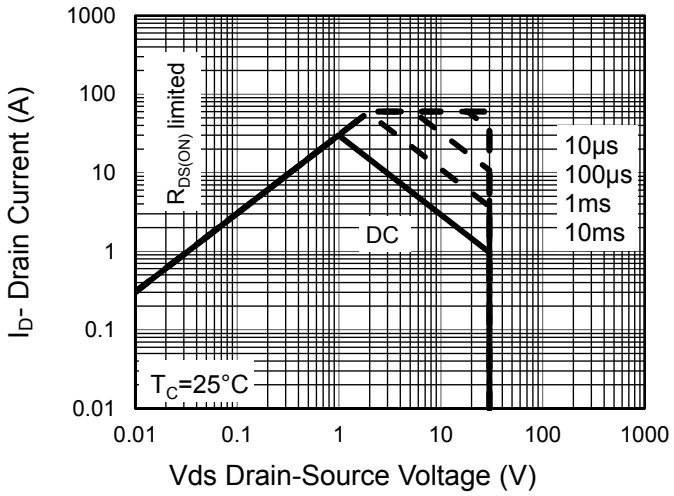


Figure 8 Safe Operation Area

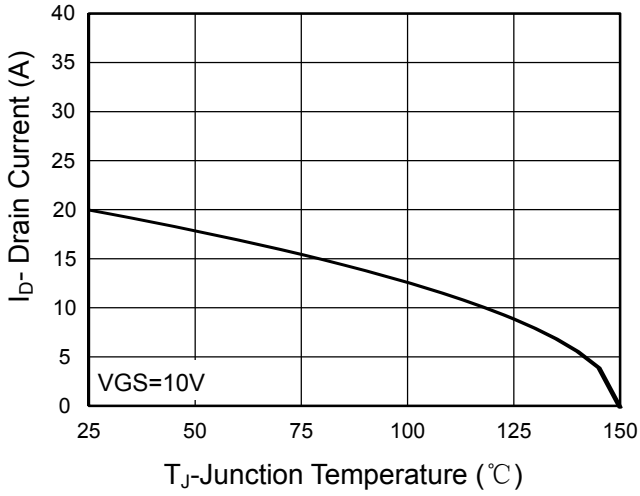


Figure 10 Current De-rating

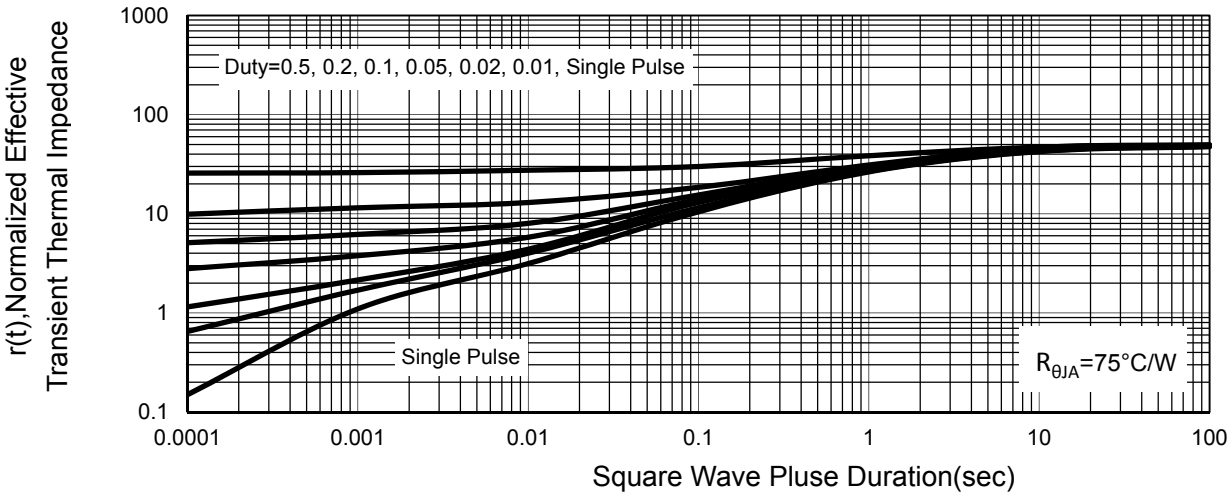


Figure 11 Normalized Maximum Transient Thermal Impedance

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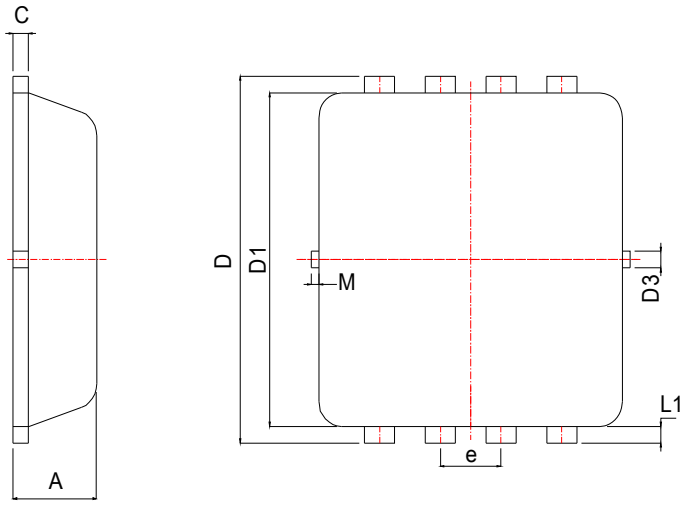

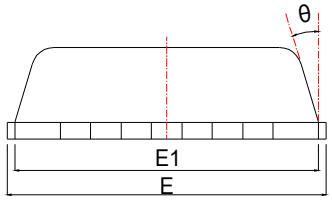

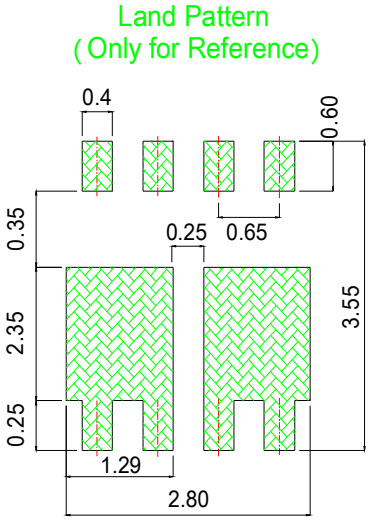

SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031	E1	3.00	3.15	3.20	0.118	0.122	0.126
b	0.25	0.30	0.35	0.010	0.012	0.014	E2	2.39	2.49	2.59	0.094	0.098	0.102
c	0.10	0.15	0.25	0.004	0.007	0.010	e	0.65BSC			0.026BSC		
D	3.25	3.35	3.45	0.128	0.132	0.136	H	0.30	0.40	0.50	0.012	0.016	0.020
D1	3.00	3.10	3.20	0.118	0.122	0.126	L	0.30	0.40	0.50	0.012	0.016	0.020
D2	1.78	1.88	1.98	0.070	0.074	0.078	L1	*	0.13	*	*	0.005	*
D3	*	0.13	*	*	0.005	*	θ	*	10°	12°	*	10°	12°
E	3.20	3.30	3.40	0.126	0.130	0.134	M	*	*	0.15	*	*	0.006
K	0.30	*	*	0.012	*	*							