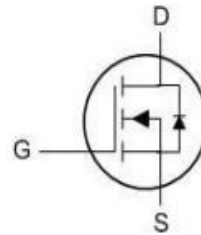
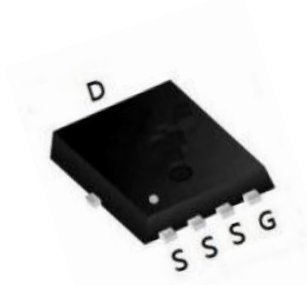


Features

The TW150N03EF is the high cell density trench N-channel MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The TW150N03EF the RoHS and Green Product requirement, 100%EAS guaranteed with full function reliability approved.

Product Summary

BVDSS	RDSON	ID
30V	1.5mΩ	150A



PDFN5X6

Maximum Ratings(Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	VDS	30	V
Gate-Source Voltage	VGS	±20	
Continuous Drain Current, VGS @ 10V ^{1.6}	ID@TC =25°C	150	A
Continuous Drain Current, VGS @ 10V ^{1.6}	ID@TC=100°C	80	
Pulsed Drain Current ①	IDM	350	
Single Pulse Avalanche Energy ³	EAS	580	mj
Avalanche Current	IAS	60	A
Power Dissipation ②	PD@TC=25°C	87	W
Storage Temperature	TSTG	-55 to 175	°C
Operating Junction	TJ	-55 to 175	

Thermal Data

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-Ambient	RθJA		62	°C/W
Thermal Resistance Junction-Case	RθJC		2.4	°C/W

Electrical Characteristics(TJ=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BVDSS	VGS = 0V, ID = 250μA	30			V
Zero Gate Voltage Drain Current	IDSS	VDS = 30V, VGS =0V			1	μA
Gate-Body leakage Current	IGSS	VDS =0V, VGS = ±20V			±100	nA
Gate Threshold Voltage	VGS(th)	VDS =VGS, ID = 250μA	1.2		2.4	V
Static Drain-Source On-Resistance	RDS(on)	VGS = 10V, ID = 30A		1.5	2.9	mΩ
		VGS = 5V, ID = 30A		2.2	4.8	mΩ
Dynamic Parameters						
Input Capacitance	Ciss	VGS=0V, VDS=15V, f=1MHz		6272		pF
Output Capacitance	Coss			1022		pF
Reverse Transfer Capacitance	Crss			718		pF
Total Gate Charge	Qg	VDS=24V, VGS=10V, ID=30A , IG=5mA (note 4,5)		143		nC
Gate Source Charge	Qgs			17		nC
Gate Drain Charge	Qgd			43		nC
Switching Parameters						
Turn-On DelayTime	td(on)	VDS=15V, ID=30A, RG=4.7Ω, VGS=10V (note 4,5)		20		ns
Turn-On Rise Time	tr			58		ns
Turn-Off DelayTime	td(off)			158		ns
Turn-Off Fall Time	tf			77		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Diode forward voltage drop.	VSD	IS=45A, VGS=0V			1.4	V
Continuous source current	IS	Integral reverse p-n Junction diode in the MOSFET			110	A
Pulsed source current	ISM				440	
Reverse recovery time	Trr	IS=30A, VGS=0V, dIF /dt=100A/us		26	50	nS
Reverse recovery charge	Qrr			10	20	nC

Note :

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 10 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

Fig. 1. On-state characteristics

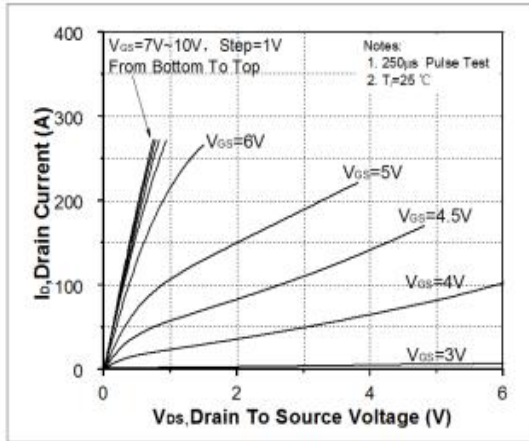


Fig. 2. Transfer Characteristics

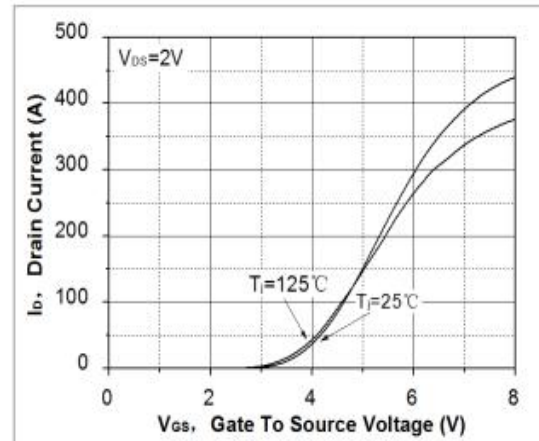


Fig. 3. On-resistance variation vs. drain current and gate voltage

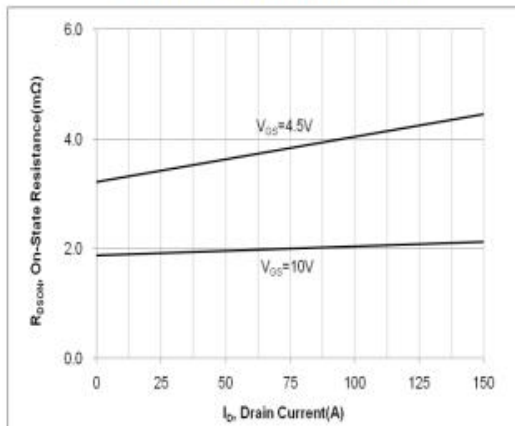


Fig. 4. On-state current vs. diode forward voltage

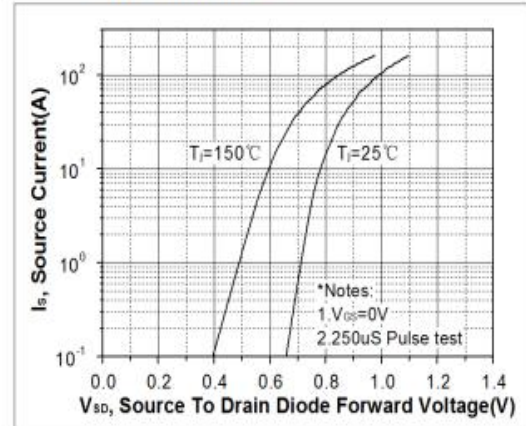


Fig 5. Breakdown voltage variation vs. junction temperature

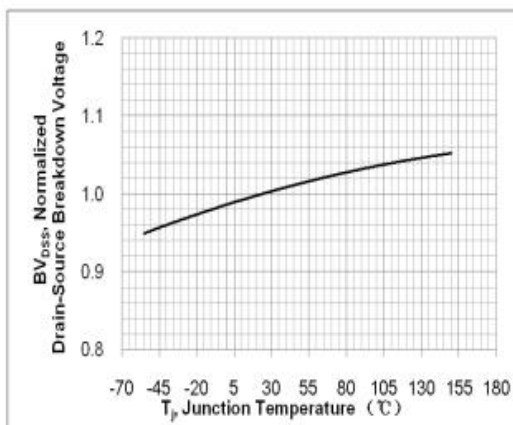
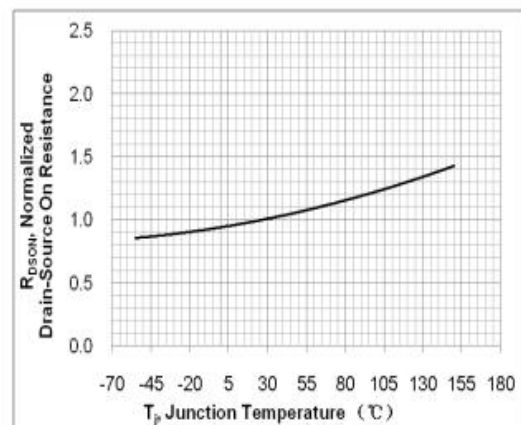


Fig. 6. On-resistance variation vs. junction temperature



Typical Electrical and Thermal Characteristics

Fig. 7. Gate charge characteristics

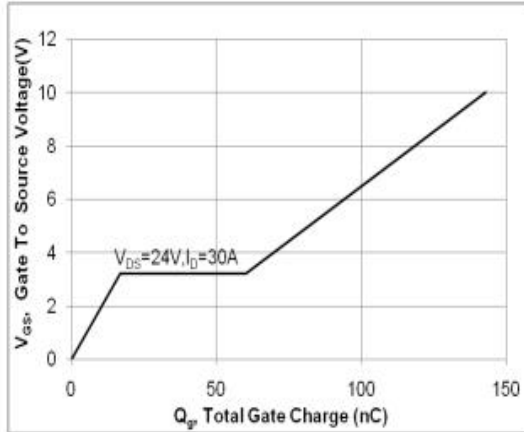


Fig. 8. Capacitance Characteristics

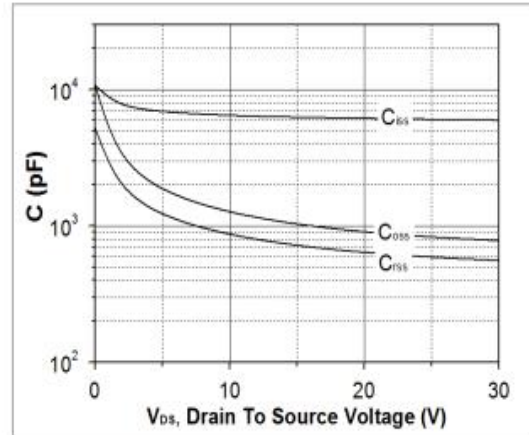


Fig. 9. Maximum safe operating area

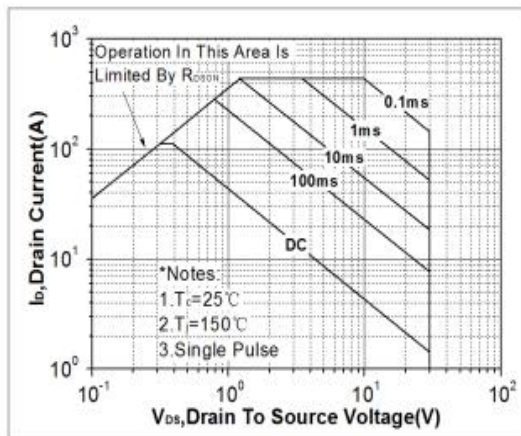


Fig. 10. Maximum drain current vs. case temperature

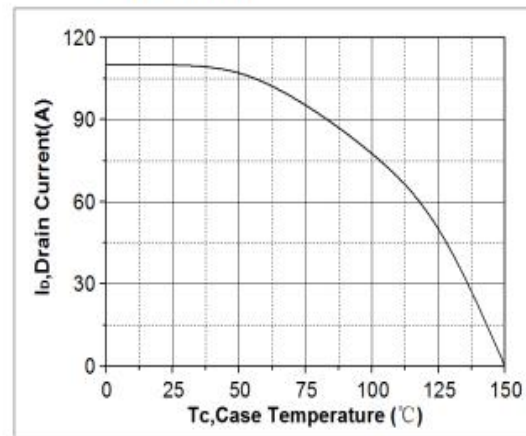
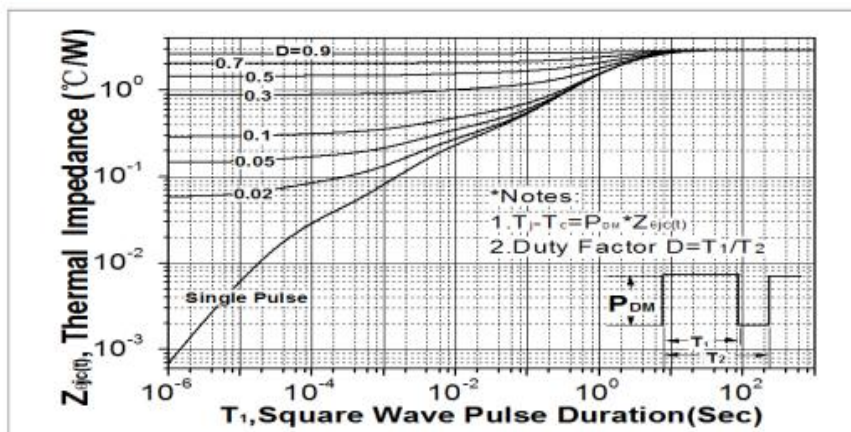


Fig. 11. Transient thermal response curve



Test Circuit

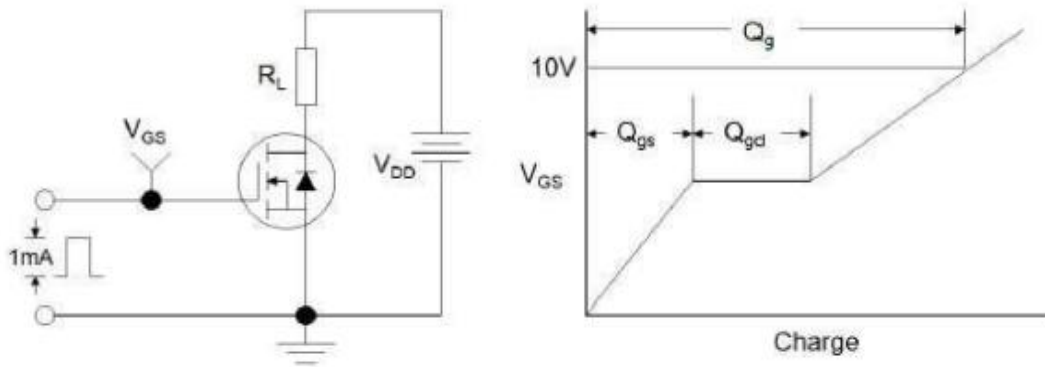


Figure1:Gate Charge Test Circuit & Waveform

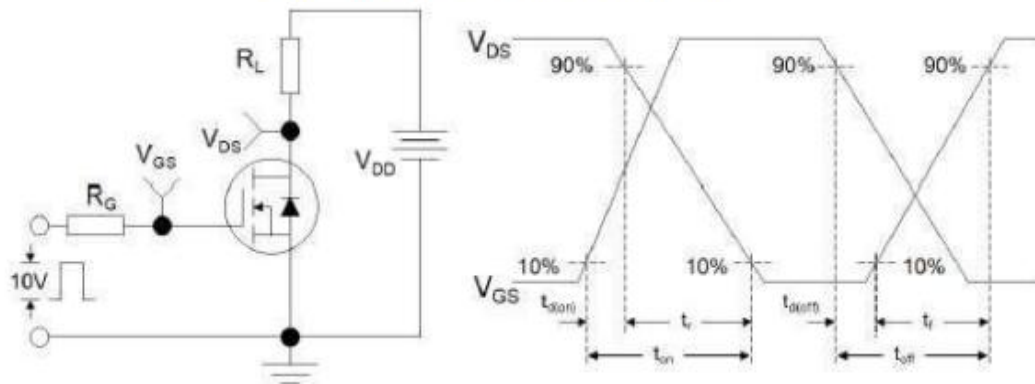


Figure 2: Resistive Switching Test Circuit & Waveforms

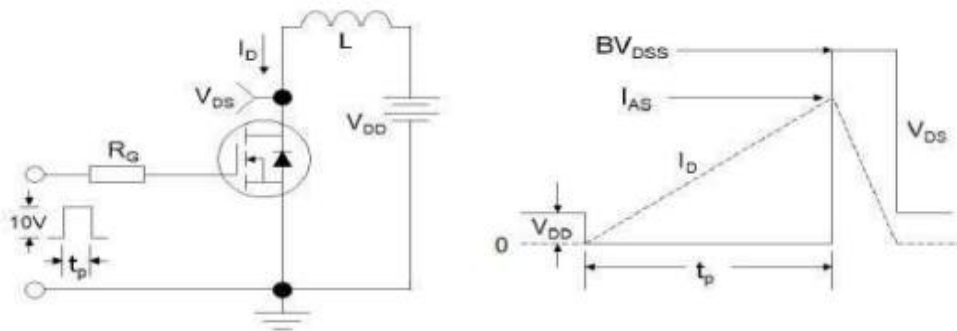
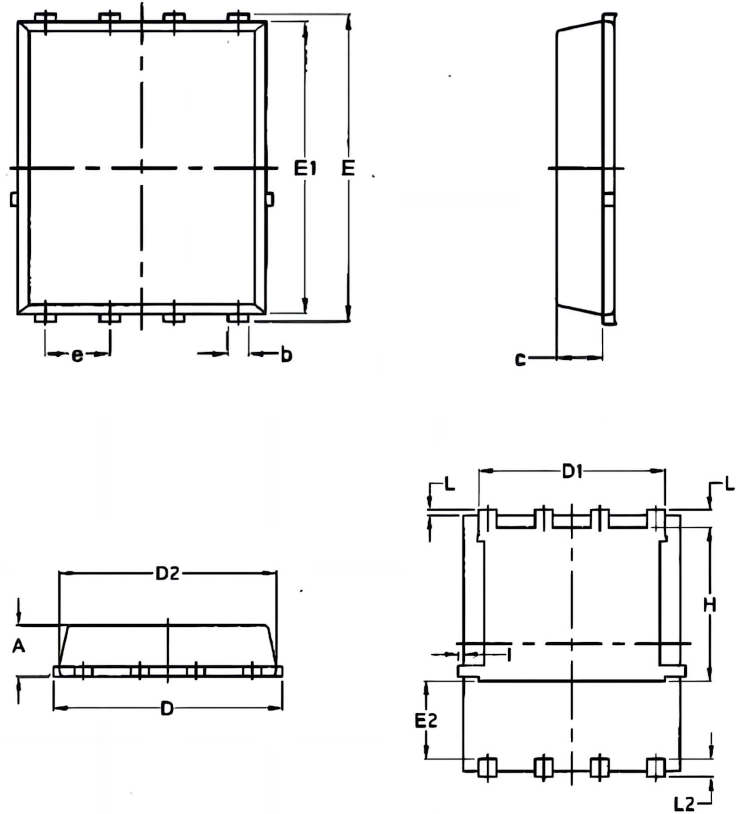


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

PDFN5X6 Package Outline Dimesions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070
I	/	0.18	/	0.0070