Features

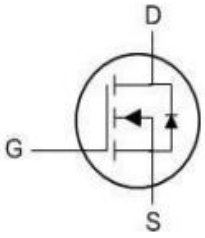
The TW120N03EF is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The TW120N03EF eet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary

BVDSS	RDSON	ID
30V	3.0mΩ	120A



PDFN5X6



Maximum Ratings(Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current, VGS @ 10V[1]	ID@TC =25℃	120	A
Continuous Drain Current, VGS @ 10V[1]	ID@TC=100℃	75	
Pulsed Drain Current ①	I_{DM}	280	
Single Pulse Avalanche Energy3	EAS	198	mJ
Avalanche Current	I_{AS}	53.8	A
Total Power Dissipation[4]	PD@TC=25℃	62.5	W
Total Power Dissipation[4]	PD@TA=25℃	2.24	W
Storage Temperature	T_{STG}	-55 to 175	℃
Operating Junction	T_J	-55 to 175	

Thermal Data

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-Ambient [1]	RθJA		62	℃/W
Thermal Resistance Junction-Ambient 1 (t ≤10s)	RθJA		25	℃/W
Thermal Resistance Junction-Case[1]	RθJC		2.4	℃/W

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

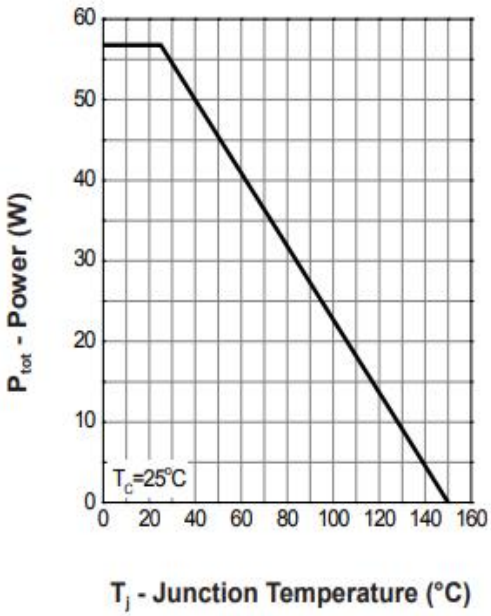
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS = 0V, ID = 250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	VDS = 24V, VGS =0V			1	μA
Gate-Body leakage Current	I_{GSS}	VDS =0V, VGS = ±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VDS =VGS, ID = 250μA	1.4	1.7	2.5	V
Static Drain-Source On-Resistance	RDS(on)	VGS = 10V, ID = 20A		3	3.8	mΩ
		VGS = 4.5V, ID = 15A		4	5.5	mΩ
Dynamic Parameters						
Input Capacitance	C_{iss}	VGS=0V, VDS=15V, Frequency=1.0MHz		2485		pF
Output Capacitance	C_{oss}			850		pF
Reverse Transfer Capacitance	C_{rss}			85		pF
Total Gate Charge	Q_g	VDS=15V, VGS=4.5V, IDS=20A		9.8		nC
Gate Source Charge	Q_{gs}			3.8		nC
Gate Drain Charge	Q_{gd}			3.7		nC
Switching Parameters						
Turn-On DelayTime	$t_{d(on)}$	VDD=15V, RL=15W, IDS=1A, VGEN=10V, RG=6Ω		12.4		ns
Turn-On Rise Time	tr			9.8		ns
Turn-Off DelayTime	td(off)			27.2		ns
Turn-Off Fall Time	tf			35.2		ns

Note :

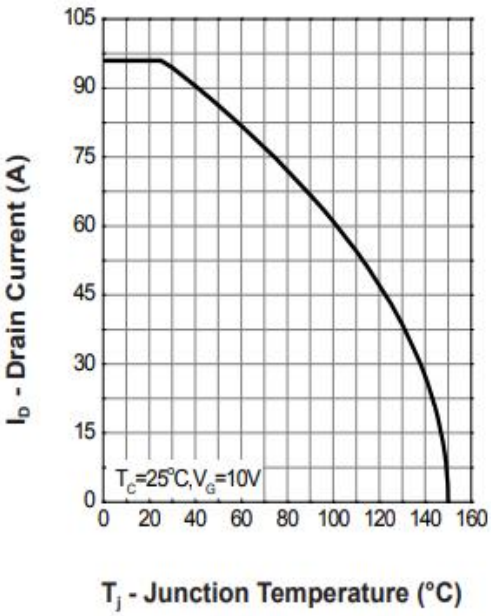
1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 10 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

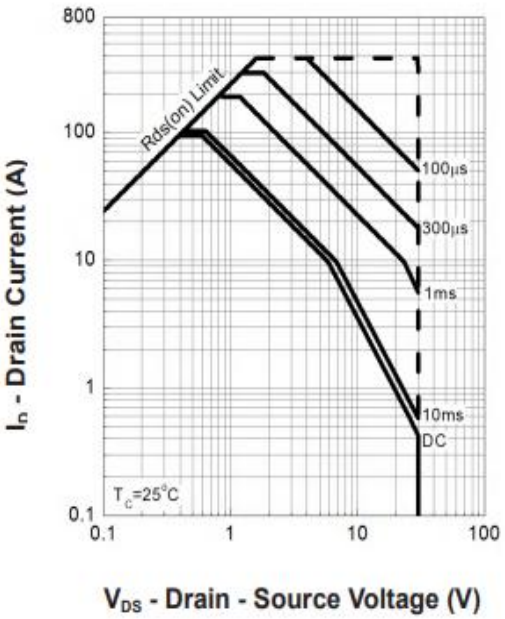
Power Dissipation



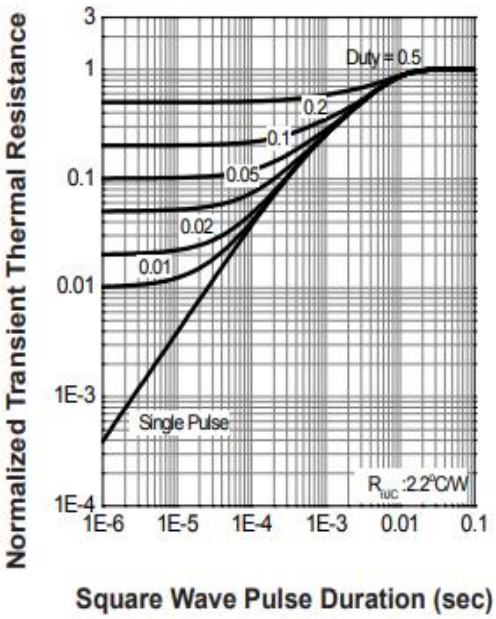
Drain Current



Safe Operation Area

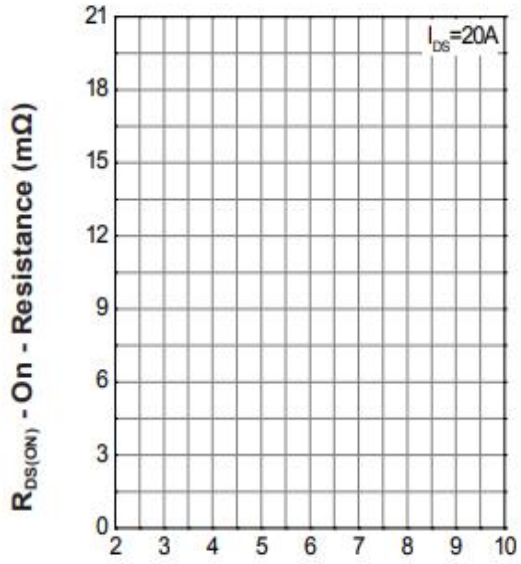


Thermal Transient Impedance

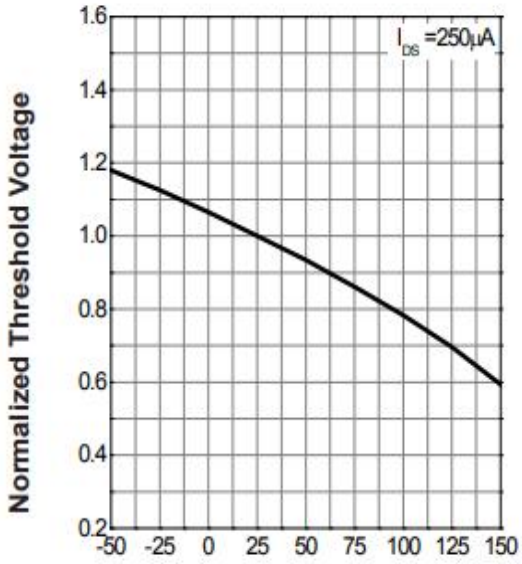


Typical Electrical and Thermal Characteristics

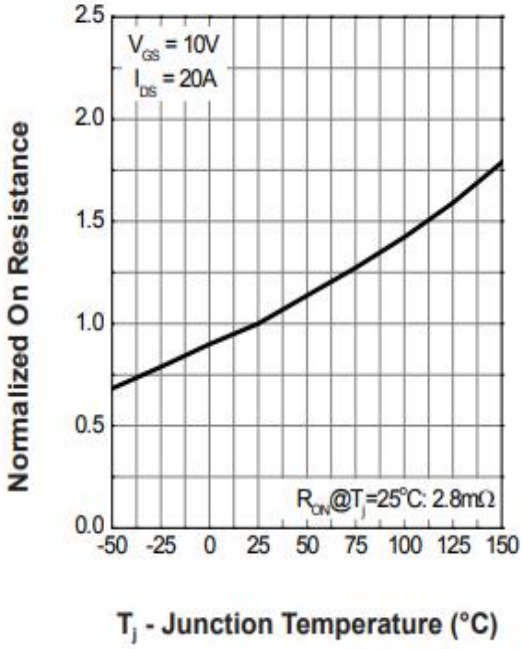
Gate-Source On Resistance



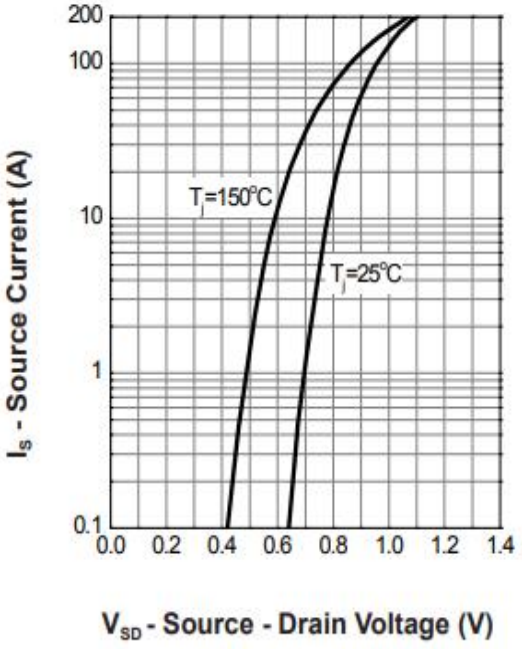
Gate Threshold Voltage



Drain-Source On Resistance

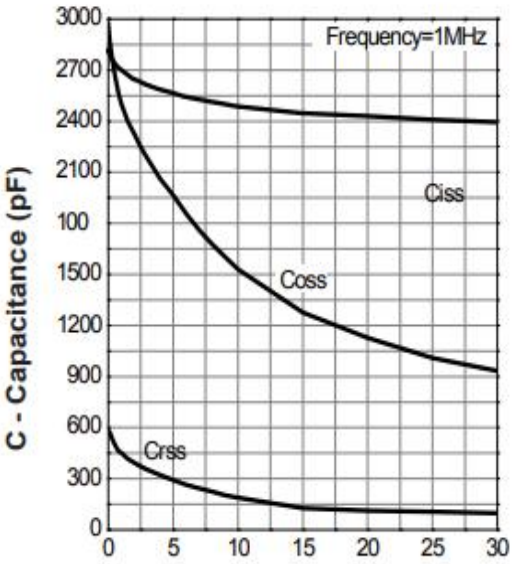


Source-Drain Diode Forward

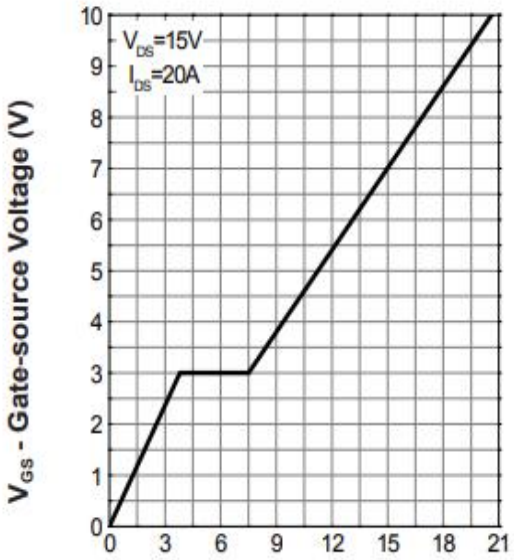


Typical Electrical and Thermal Characteristics

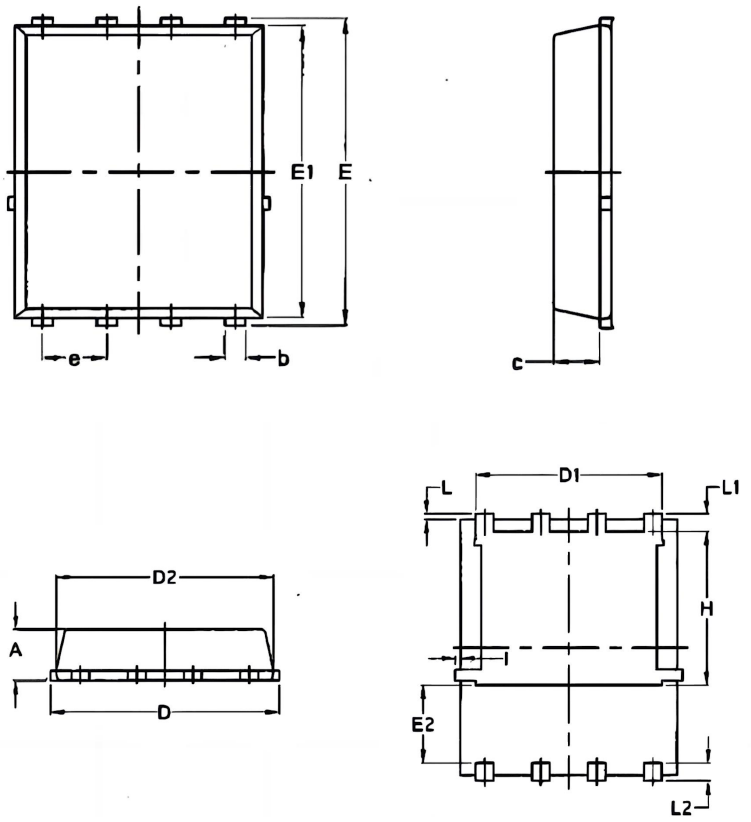
Capacitance



Gate Charge



PDFN5X6 Package Outline Dimesions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Mim	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