

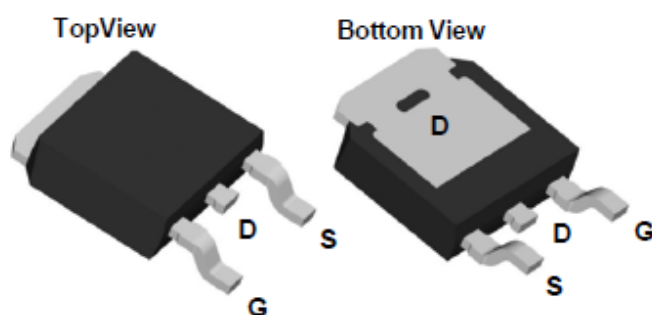
Features

The TW120N03D is the high cell density trench N ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

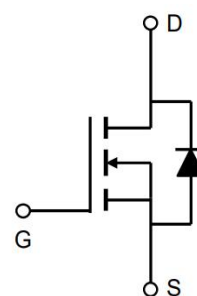
The TW120N03D meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary

BVDSS	RDSON	ID
30V	3.0mΩ	120A



TO-252



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current, V _{GS} @10V ¹	I _D @TC=25°C	120	A
Continuous Drain Current, V _{GS} @10V ¹	I _D @TC=100°C	75	
Pulsed Drain Current ①	I _{DM}	384	
Single Pulse Avalanche Energy	EAS	198	mJ
Avalanche Current	I _{AS}	53.8	A
Power Dissipation ②	PD@TC=25°C	62.5	W
Power Dissipation ②	PD@TA=25°C	2.42	W
Thermal Resistance Junction-Ambient	R _{θJA}	62	°C/W
Thermal Resistance Junction-Ambient ¹ (t ≤10s)	R _{θJA}	25	°C/W
Thermal Resistance Junction-Case	R _{θJC}	2.4	°C/W
Operating Junction	T _J	-55~+175	°C
Storage Temperature	T _{STG}	-55~+175	°C

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

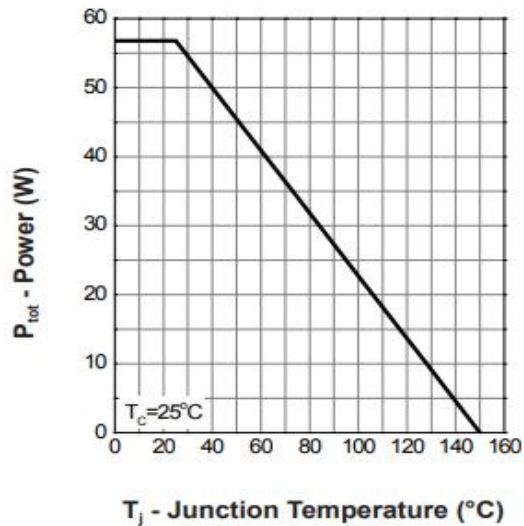
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D = 250μA	1.4	1.7	1.0	2.5
Gate-Body leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20V, V _{GS} =0V			1	μA
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 15A		3	3.8	mΩ
	R _{DS(on)}	V _{GS} = 4.5V, I _D = 10A		4.4	5.5	mΩ
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz		2485	2971	pF
Output Capacitance	C _{oss}			850		pF
Reverse Transfer Capacitance	C _{rss}			85		pF
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =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	td(on)	V _{DD} =15V, R _L =15W, I _{DS} =1A, V _{GEN} =10V, R _G =6W		12.4	23	ns
Turn-On Rise Time	tr			9.5	18	ns
Turn-Off DelayTime	td(off)			27.2	49	ns
Turn-Off Fall Time	tf			35.2	64	ns

Note :

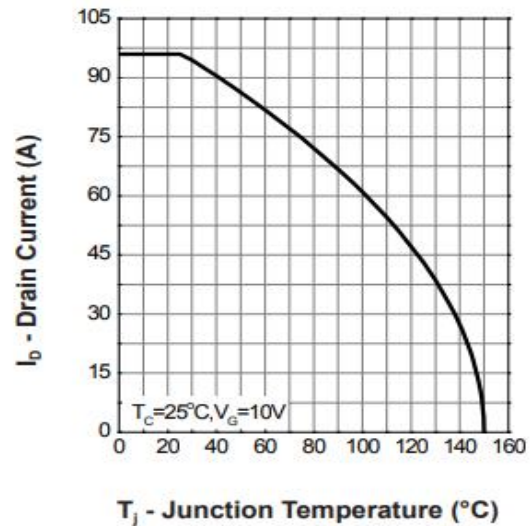
1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

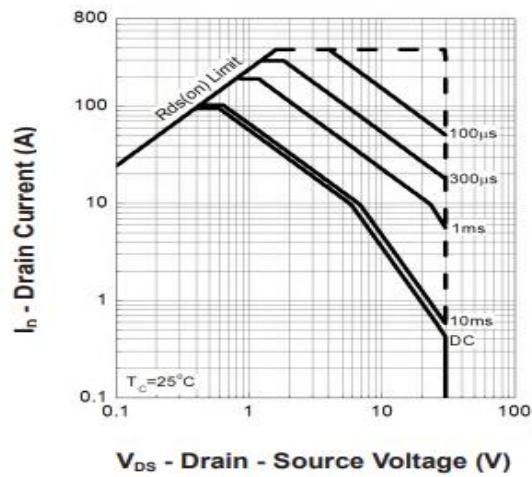
Power Dissipation



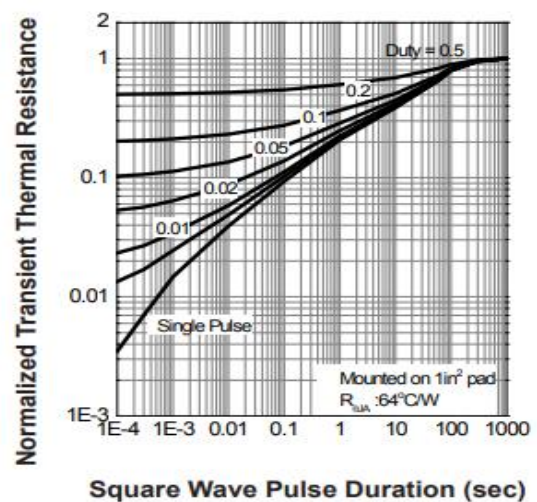
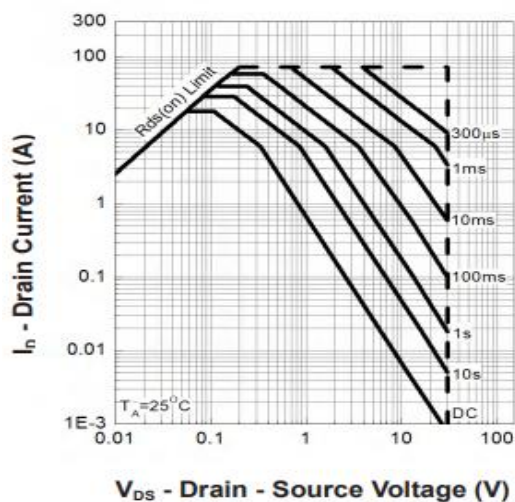
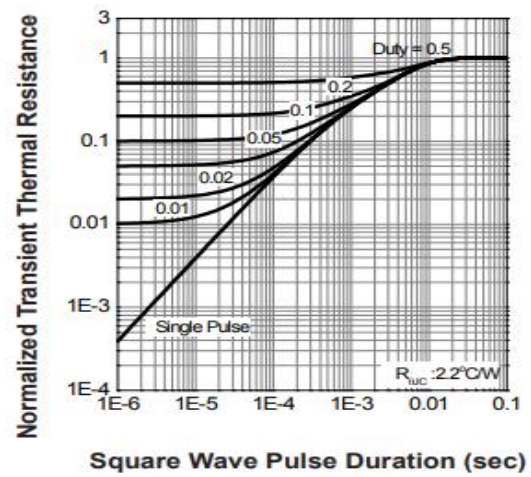
Drain Current



Safe Operation Area

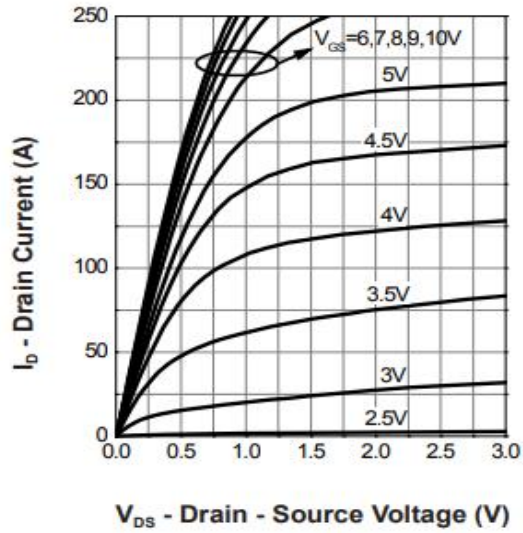


Thermal Transient Impedance

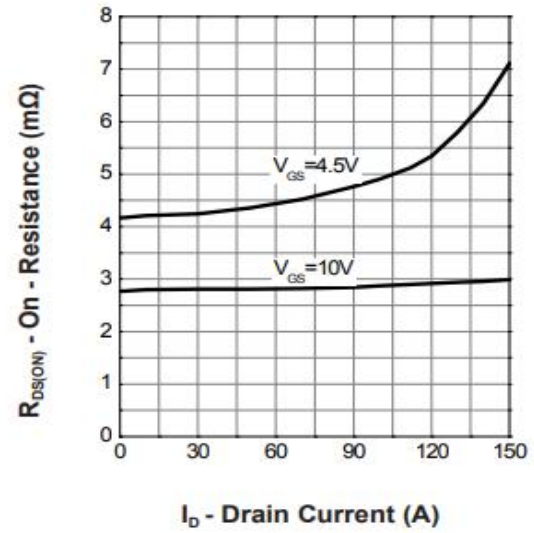


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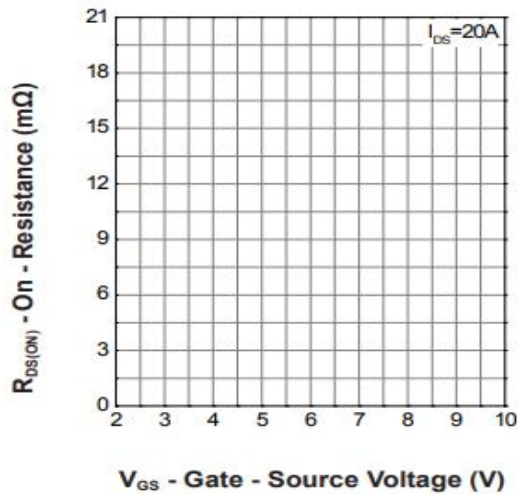
Output Characteristics



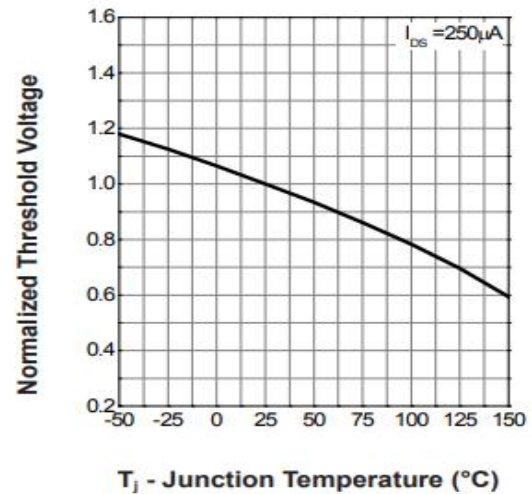
Drain-Source On Resistance



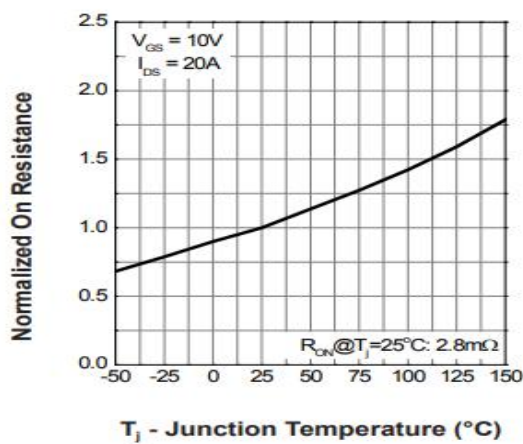
Gate-Source On Resistance



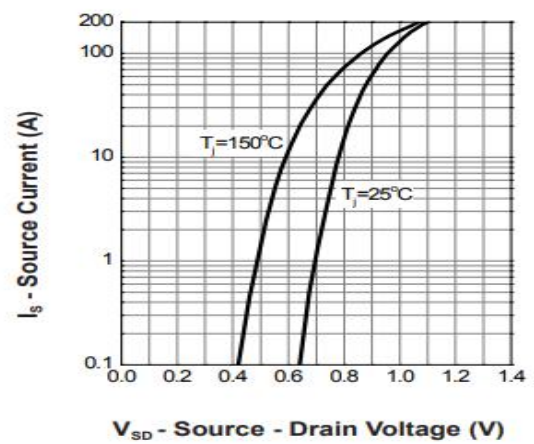
Gate Threshold Voltage



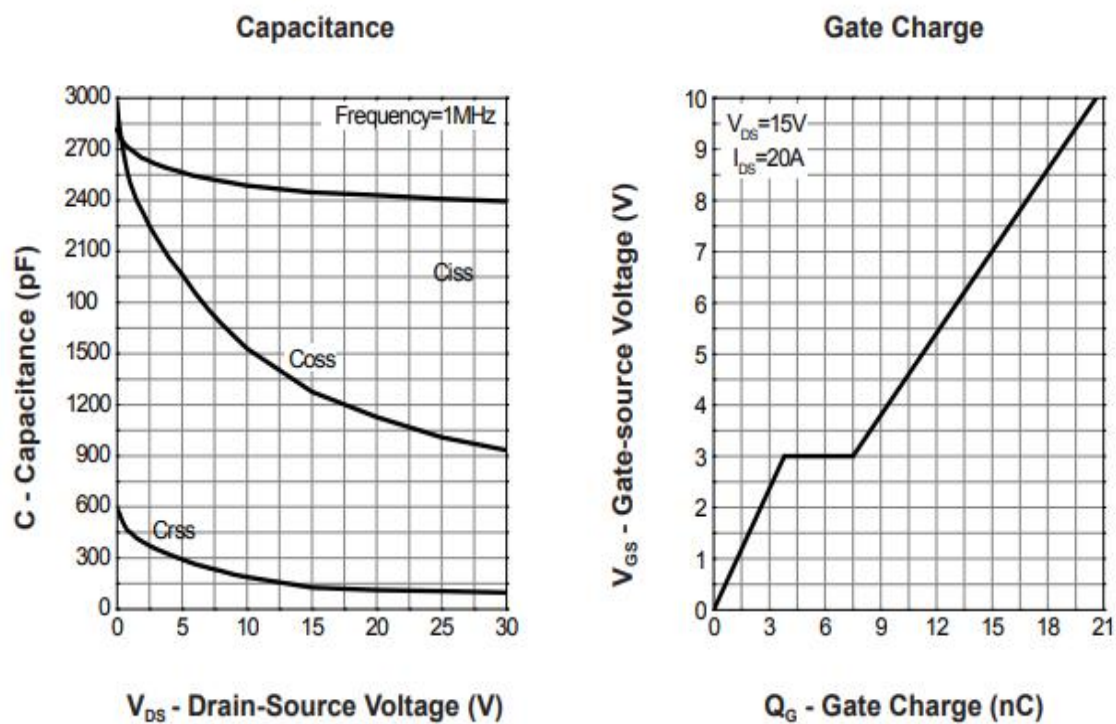
Drain-Source On Resistance



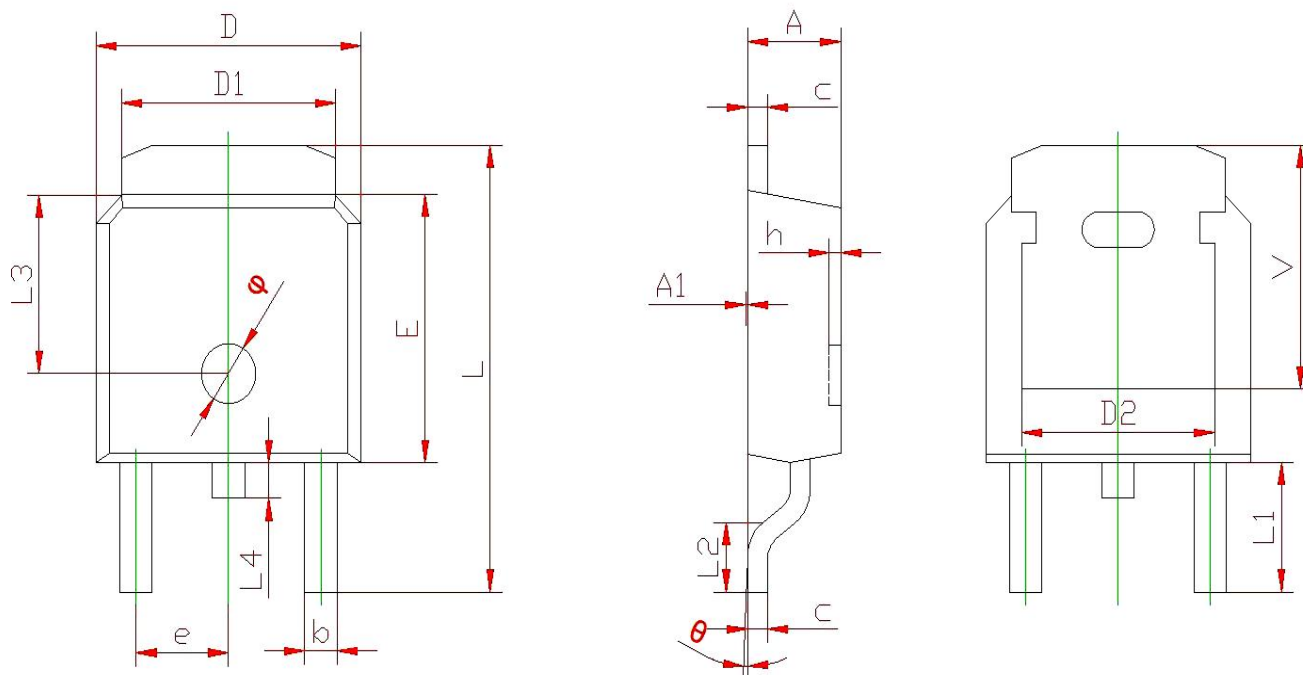
Source-Drain Diode Forward



Typical Electrical and Thermal Characteristics



TO-252 Package Outline Dimesions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.800 REF		0.189 REF	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF		0.114 REF	
L2	1.400	1.700	0.055	0.067
L3	4.000 REF		0.157 REF	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.5000 REF		0.217 REF	