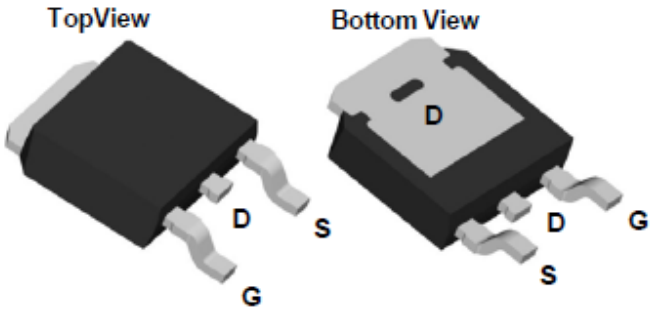
Features

The TW20N03D is the high cell density trenched N ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

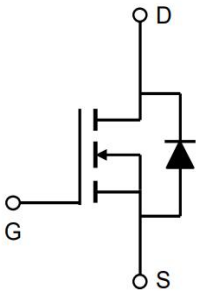
The TW20N03D meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability apprved.

Product Summary

BVDSS	RDSON	ID
30V	15mΩ	20A



TO-252



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℃	20	A
Continuous Drain Current,VGS @10V[1]	ID@TC=100℃	8	
Pulsed Drain Current ①	I_{DM}	38	
Single Pulse Avalanche Energy	EAS	28	mJ
Avalanche Current	I_{AS}	13.8	A
Power Dissipation ②	P_D	5.5	W
Thermal Resistance Junction-Case	$R_{\theta JC}$	36	℃/W
Operating Junction	TJ	-55~+175	℃
Storage Temperature	T_{STG}	-55~+175	℃

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
Gate Threshold Voltage	$V_{GS(th)}$	VDS =VGS, ID = 250μA	1.0	1.5	2.5	V
Gate-Body leakage Current	I_{GSS}	VDS =0V, VGS = ±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	VDS = 30V, VGS =0V			1	μA
Static Drain-Source On-Resistance	$R_{DS(on)}$	VGS = 10V, ID = 5A		15	20	mΩ
	$R_{DS(on)}$	VGS = 4.5V, ID = 3A		21	29	mΩ
Dynamic Parameters						
Input Capacitance	C_{iss}	VDS=15V, VGS=0V, f=1.0MHz		490		pF
Output Capacitance	C_{oss}			79		pF
Reverse Transfer Capacitance	C_{rss}			61		pF
Total Gate Charge	Q_g	VDS=15V, ID=5.8A, VGS=10		10		nC
Gate Source Charge	Q_{gs}			1.7		nC
Gate Drain Charge	Q_{gd}			2.5		nC
Switching Parameters						
Turn-On DelayTime	$t_{d(on)}$	VDS=15V, ID=3A, VGS=10V, RREN =3		6		ns
Turn-On Rise Time	tr			15		ns
Turn-Off DelayTime	$t_{d(off)}$			17		ns
Turn-Off Fall Time	tf			17		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current	Is				9	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{sM}				36	A
Drain to Source Diode Forward Voltage	VSD	VGS=0V, ISD=9A, TJ=25℃			1.2	V
Reverse Recovery Time	trr	IF=5A, dI/dt=100A/μs		7		ns
Reverse Recovery Charge	Qrr			2		nC

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

Figure1: Output Characteristics

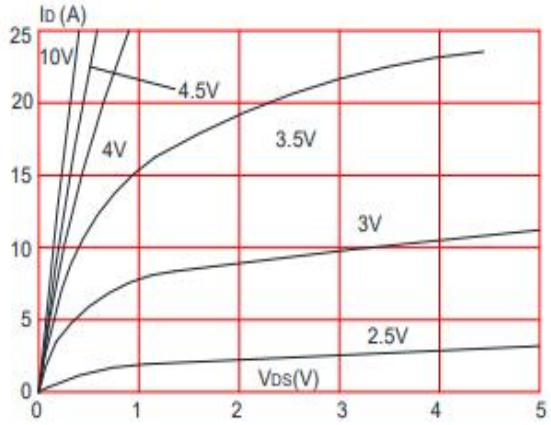


Figure 2: Typical Transfer Characteristics

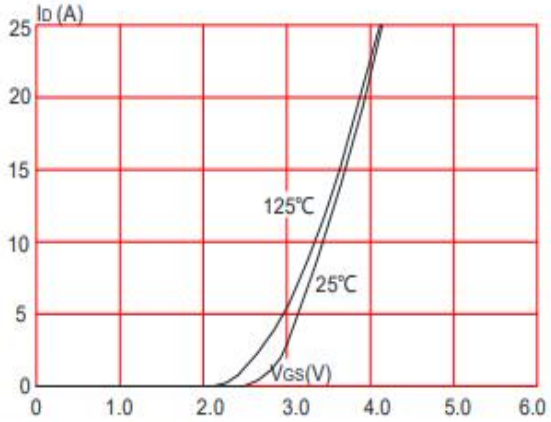


Figure 3: On-resistance vs. Drain Current

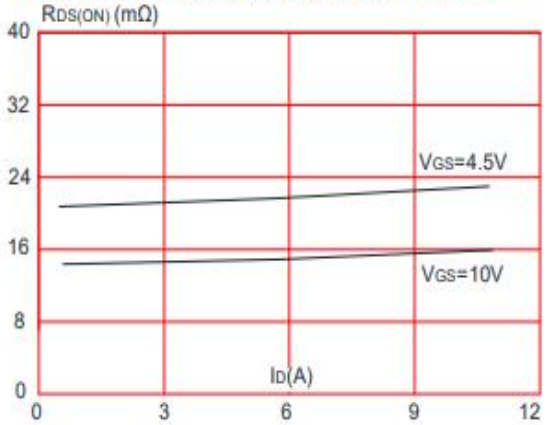


Figure 4: Body Diode Characteristics

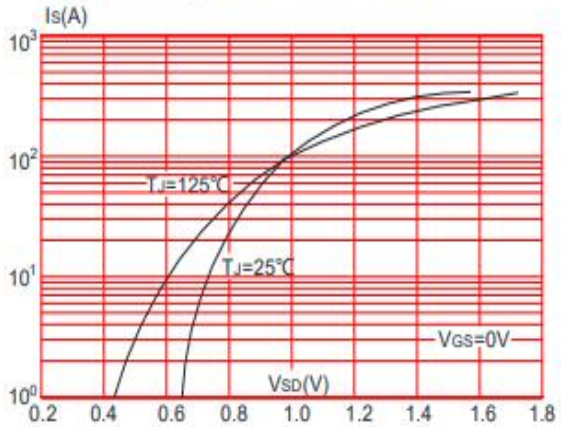


Figure 5: Gate Charge Characteristics

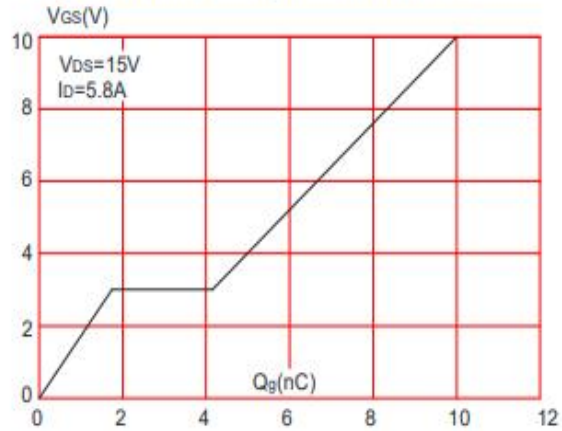
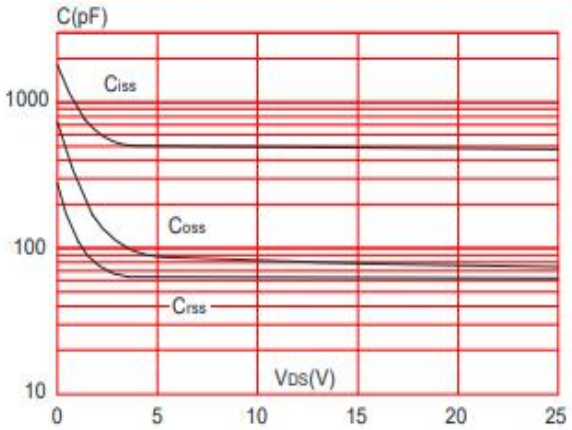


Figure 6: Capacitance Characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

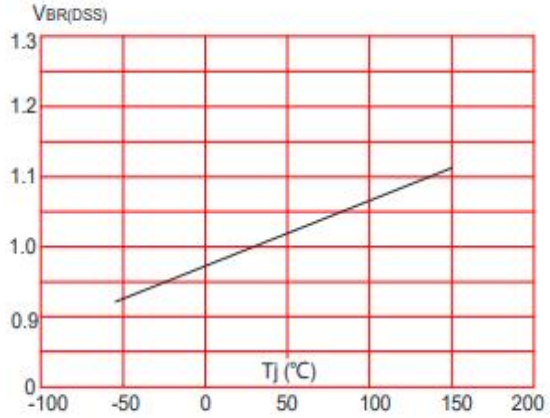


Figure 8: Normalized on Resistance vs. Junction Temperature

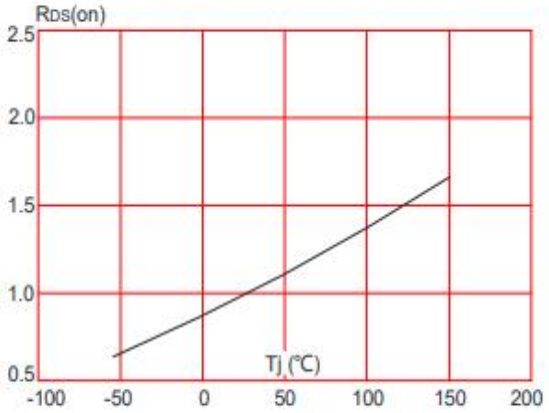


Figure 9: Maximum Safe Operating Area

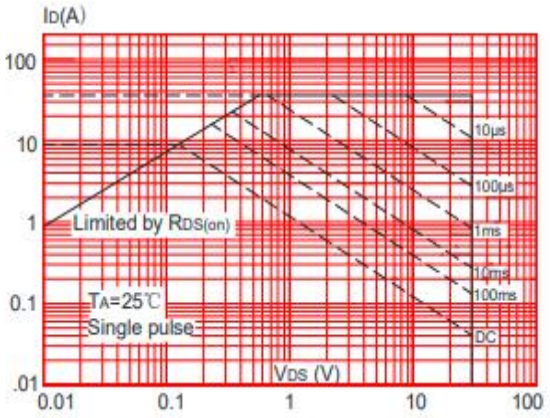


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

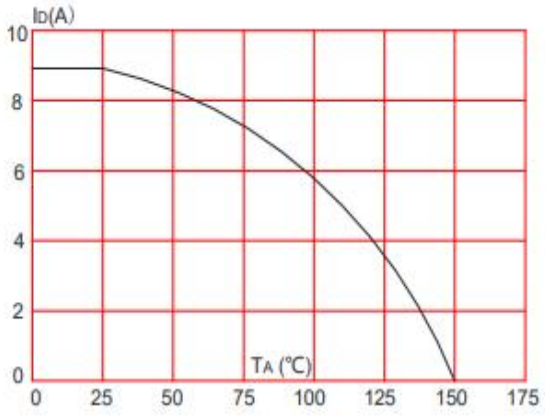
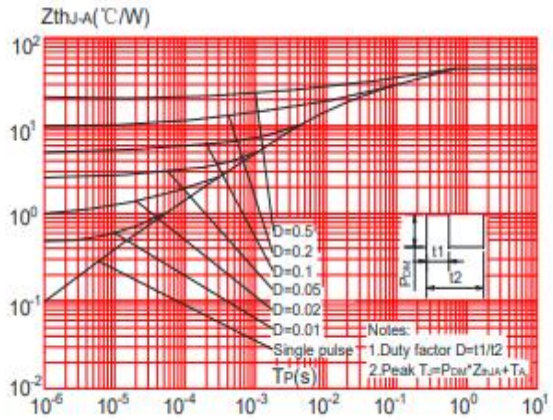


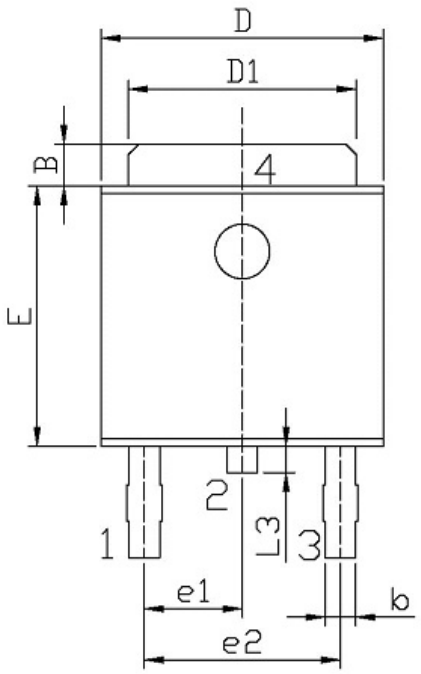
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

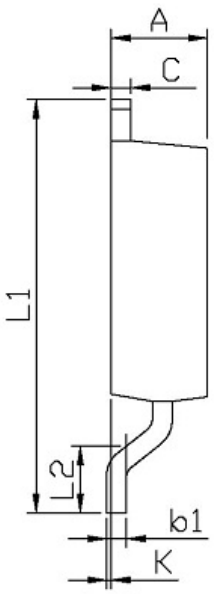


Package Mechanical Data

Unit ： mm

TO-252(DPAK)





单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.50	0.70	e2	4.43	4.73
b1	0.45	0.55	L1	9.45	9.95
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	K	0.00	0.10