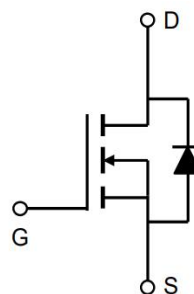
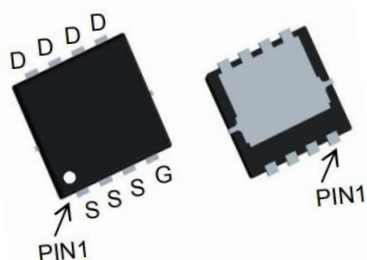


Features

The TW50N03CC is the high cell density trench N-chMOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The TW50N03CC meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary

V_{DS}	30V
I_D	50A
$R_{DS(ON)}$ (at $V_{GS} = 10V$)	< 8.5m Ω
$R_{DS(ON)}$ (at $V_{GS} = 4.5V$)	< 14m Ω



PDFN3X3

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, $V_{GS} @ 10V^1$	$I_{D@TC=25^\circ C}$	50	A
Continuous Drain Current, $V_{GS} @ 10V^1$	$I_{D@TC=100^\circ C}$	30	
Pulsed Drain Current ①	I_{DM}	120	
Single Pulse Avalanche Energy ³	EAS	39	mJ
Avalanche Current	IAS	50	A
Power Dissipation ②	PD	18	W
Storage Temperature	TSTG	-55~+150	°C
Operating Junction	TJ	-55~+151	°C

Thermal Data

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-Case ¹	R θ JC		4.8	°C/W
Thermal Resistance Junction-ambient	R θ JA		4.32	°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 = 24V, VGS =0V			1	μA
Gate-Body leakage Current	IGSS	VDS =0V, VGS = ±20V			±100	nA
Gate Threshold Voltage	VGS(th)	VDS =VGS, ID = 250μA	1.0		2.5	V
Static Drain-Source On-Resistance	RDS(on)	VGS = 10V, ID = 12A		7	8.5	mΩ
		VGS = 4.5V, ID = 10A		10	14	mΩ
Dynamic Parameters						
Input Capacitance	Ciss	VDS=15V , VGS=0V , f=1MHz		1200		pF
Output Capacitance	Coss			163		pF
Reverse Transfer Capacitance	Crss			131		pF
Total Gate Charge	Qg	VDS=20V , VGS=4.5, ID=12A		12.8		nC
Gate Source Charge	Qgs			3.3		nC
Gate Drain Charge	Qgd			4.5		nC
Switching Parameters						
Turn-On DelayTime	td(on)	VDD=12V , VGS=10V , RG=3.3Ω ID=5A		4.5		ns
Turn-On Rise Time	tr			10.8		ns
Turn-Off DelayTime	td(off)			25.5		ns
Turn-Off Fall Time	tf			9.6		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current		IS			50	A
Maximum Pulsed Drain to Source Diode Forward Current		ISM			120	A
Drain to Source Diode Forward Voltage	VSD	VGS=0V, IS=30A			1.2	V

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

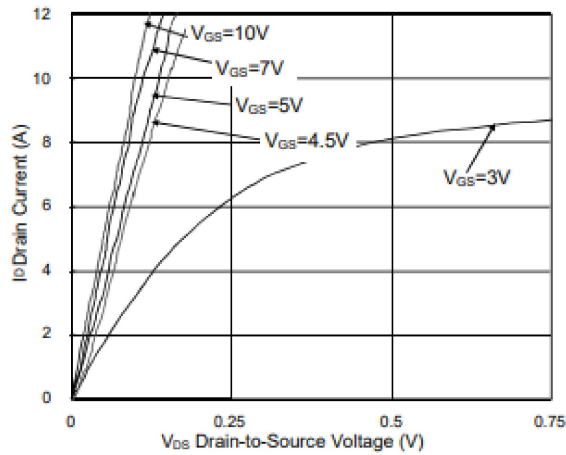


Fig.1 Typical Output Characteristics

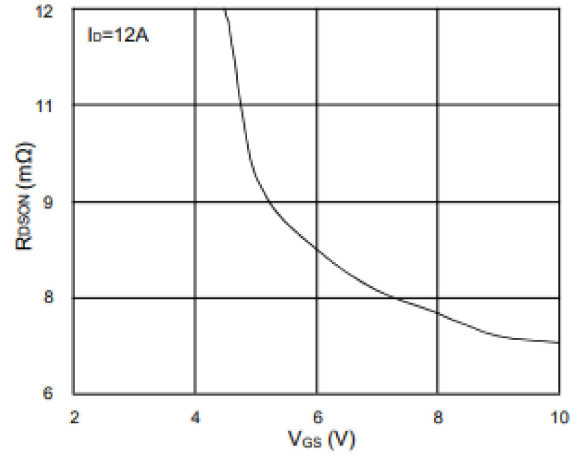


Fig.2 On-Resistance vs. G-S Voltage

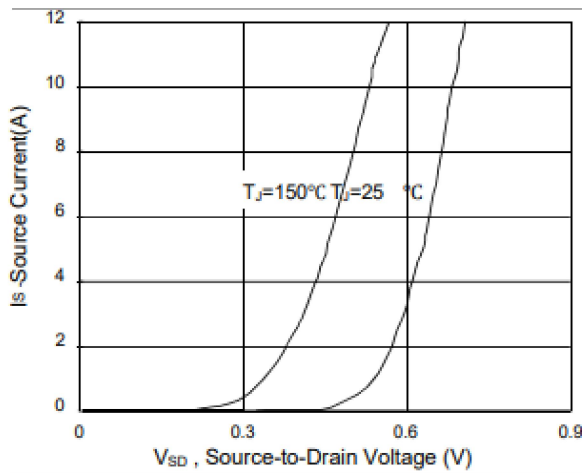


Fig.3 Forward Characteristics of Reverse

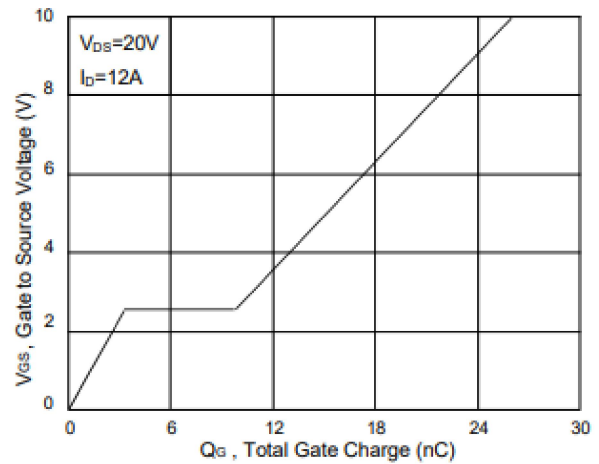


Fig.4 Gate-Charge Characteristics

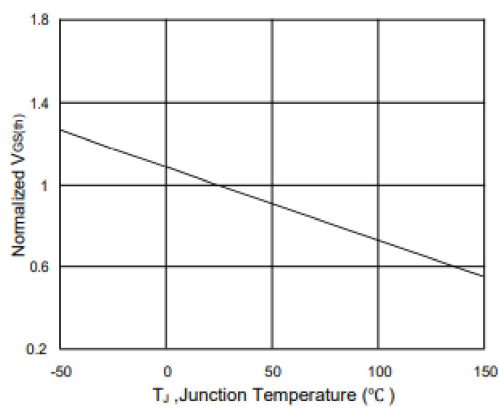


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

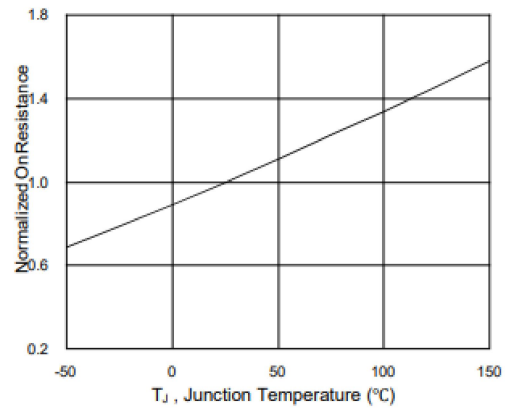
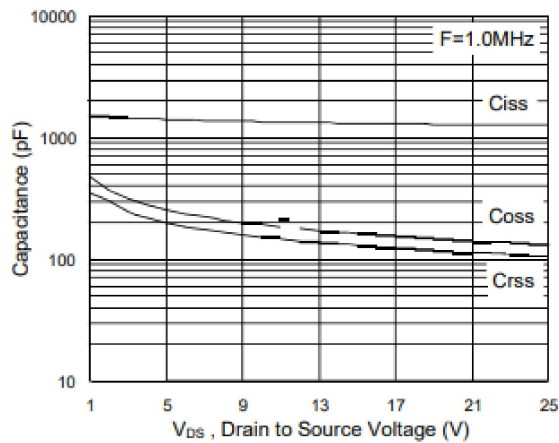
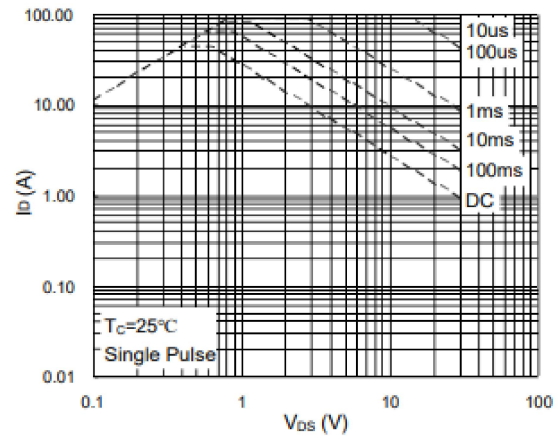
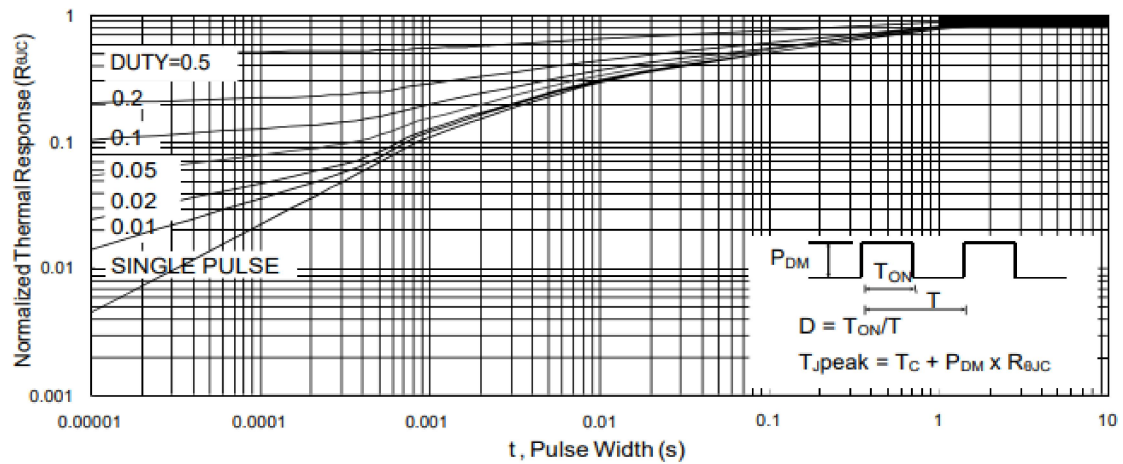
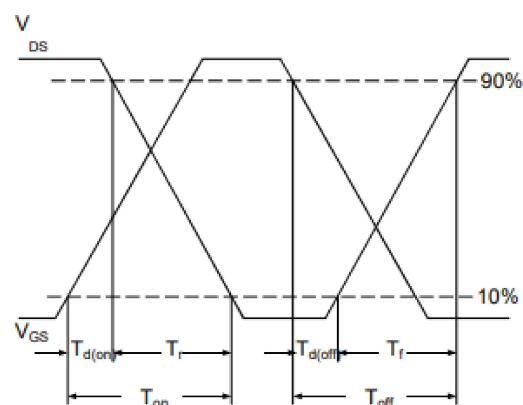
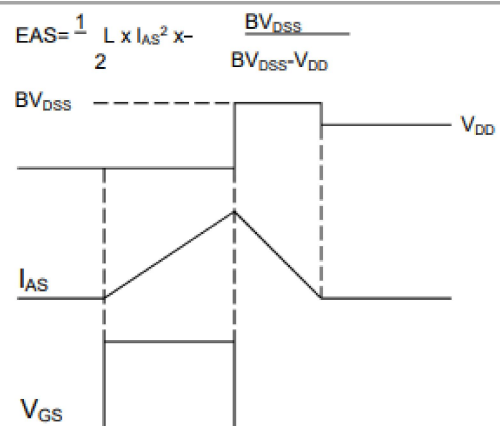


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Electrical and Thermal Characteristics


Fig.7 Capacitance

Fig.8 Safe Operating Area

Fig.9 Normalized Maximum Transient Thermal Impedance

Fig.10 Switching Time Waveform

Fig.11 Unclamped Inductive Switching Waveform

Package Information
