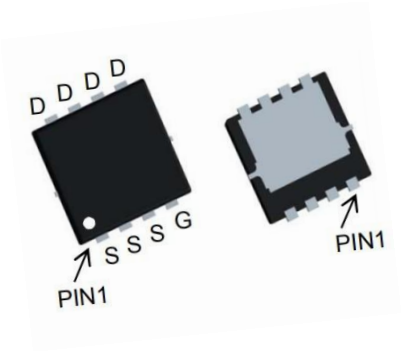
Features

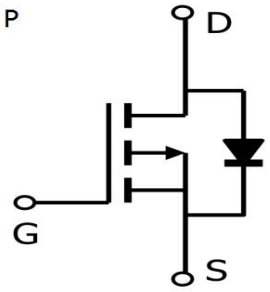
The TW30P02CC is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The TW30P02CC meet the RoHS and Green Product requirement with full function reliability approved.

Product Summary

V_{DS}	-20V
I_D	-30A
$R_{DS(ON)}$ (at V_{GS} =-4.5V)	< 15mΩ
$R_{DS(ON)}$ (at V_{GS} =-2.5V)	< 18mΩ



PDFN3X3



Maximum Ratings(Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	
Continuous Drain Current, VGS @ -4.5V	ID@TC =25℃	-30	A
Continuous Drain Current, VGS @ -4.5V	ID@TC=70℃	-18	
Pulsed Drain Current ①	I_{DM}	-68	
Total Power Dissipation	PD@TC=25℃	18	W
Total Power Dissipation	PD@TC=70℃	12	W
StorageTemperature Range	TSTG	55 to 150	℃
Operating Junction Temperature	TJ	55 to 150	℃

Thermal Data

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction-Ambie	RθJA	75	℃/W
Thermal Resistance Junction-Ambient 1 (t ≤10s)	RθJA	40	℃/W
Thermal Resistance Junction-Cas	RθJC	4.2	℃/W

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters ③						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS = 0V, ID = -250μA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	VDS=-15V , VGS=0V , TJ=25℃			1	μA
Gate-Body leakage Current	I_{GSS}	VGS=±12 V , VDS=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID=-250uA	-0.4	-0.7	-1.0	V
Static Drain-Source On-Resistance	RDS(on)	VGS =- 4.5V, ID = -10A		10	15	mΩ
		VGS =- 2.5V, ID = -8A		13	18	mΩ
Dynamic Parameters ④						
Input Capacitance	C_{iss}	VDS=-15V , VGS=0V , f=1MHz		2800		pF
Output Capacitance	C_{oss}			690		pF
Reverse Transfer Capacitance	C_{rss}			590		pF
Total Gate Charge	Q_g	VDS = -10V,VGS = -4.5V, ID = -10A		35		nC
Gate Source Charge	Q_{gs}			5.0		nC
Gate Drain Charge	Q_{gd}			10		nC
Switching Parameters ④						
Turn-On DelayTime	td(on)	VDD=-10V , VGS=-4.5V , RG=3.3Ω, ID=-10A		12		ns
Turn-On Rise Time	tr			40		ns
Turn-Off DelayTime	td(off)			30		ns
Turn-Off Fall Time	tf			10		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current		IS			-30	A
Maximum Pulsed Drain to Source Diode Forward Current		ISM				A
Drain to Source Diode Forward Voltage	VSD	VGS=0V , IS=-1A , TJ=25℃			-1.2	V
Body Diode Reverse Recovery Time	trr	IF=-10A , dI/dt=100A/μs , TJ =25℃		27		NS
Body Diode Reverse Recovery Charge	Qrr			17.8		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

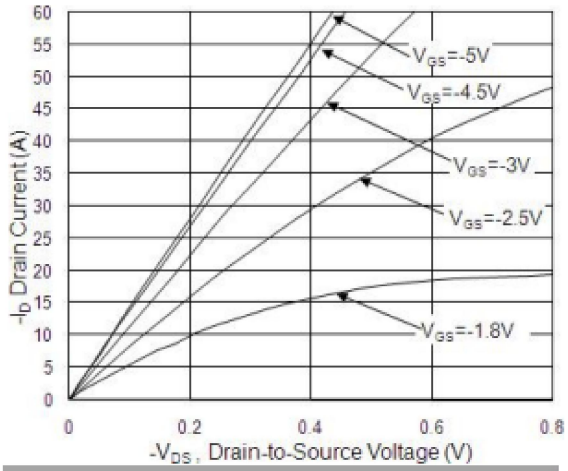


Fig.1 Typical Output Characteristics

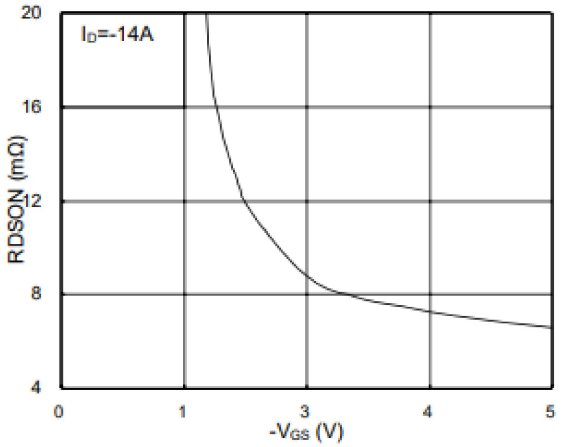


Fig.2 On-Resistance vs. G-S Voltage

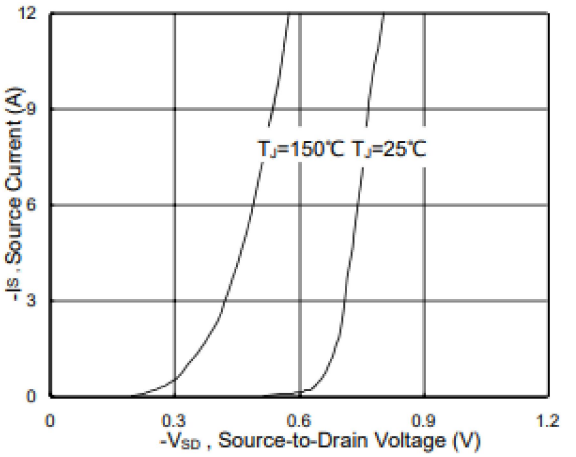


Fig.3 Forward Characteristics of Reverse

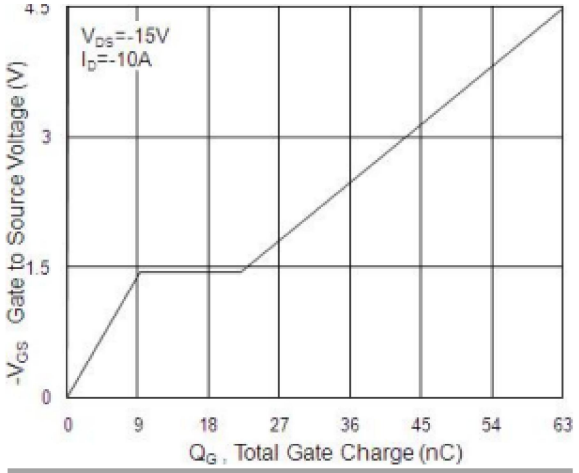


Fig.4 Gate-charge Characteristics

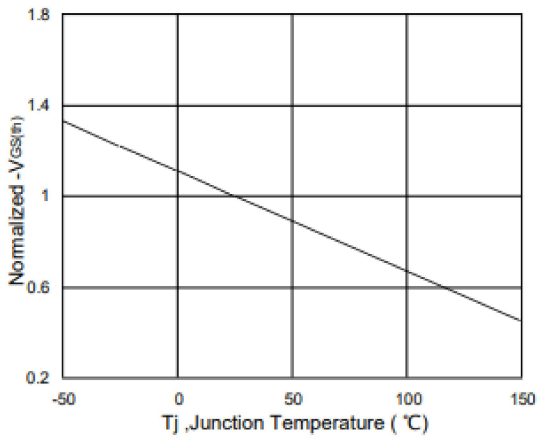


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

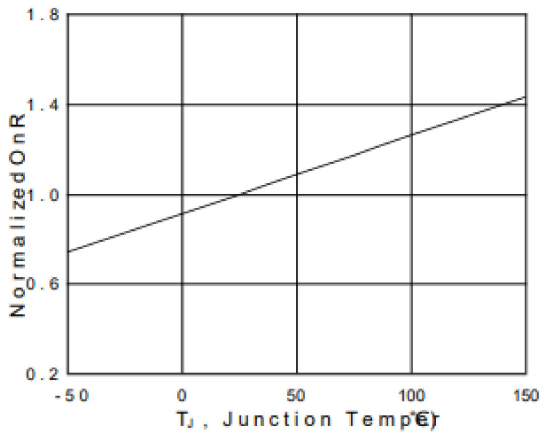


Fig.6 Normalized R_{DSON} vs. T_J

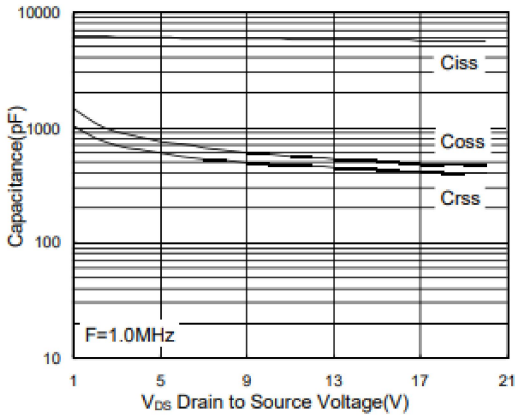


Fig.7 Capacitance

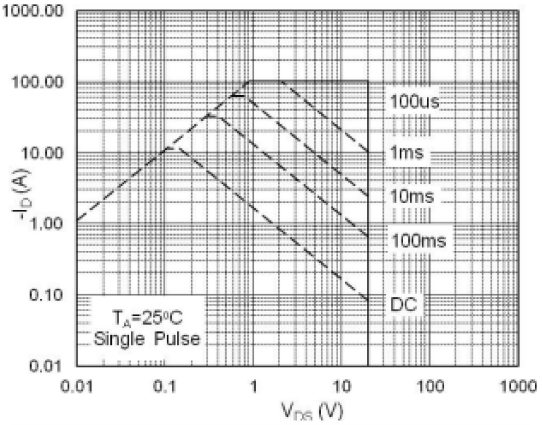


Fig.8 Safe Operating Area

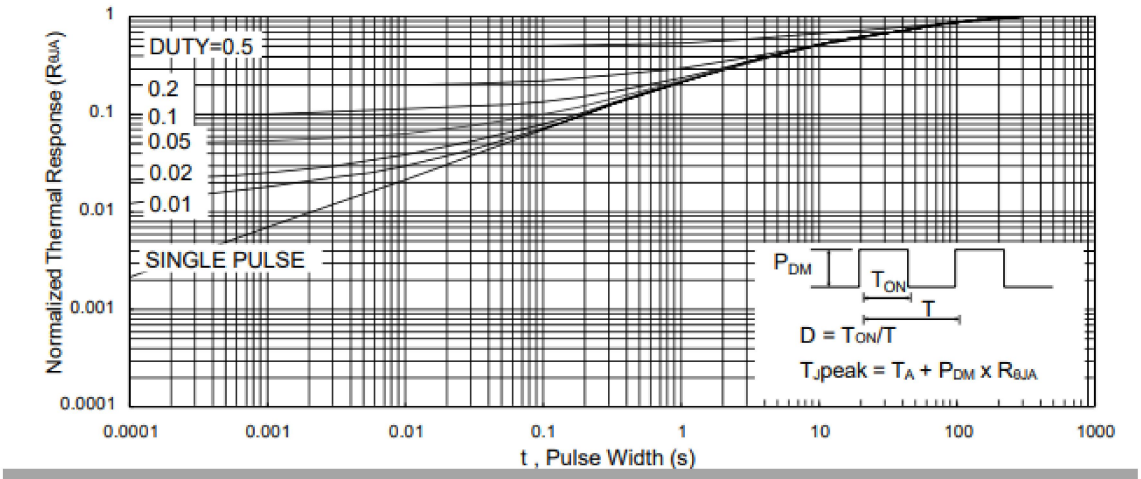


Fig.9 Normalized Maximum Transient Thermal Impedance

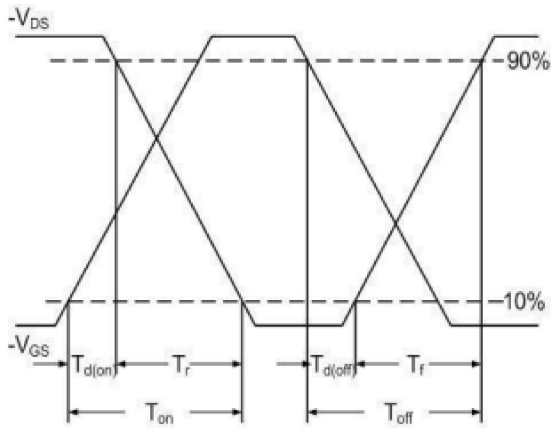


Fig.10 Switching Time Waveform

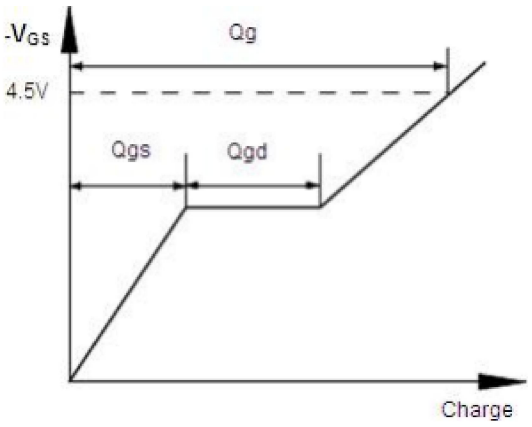
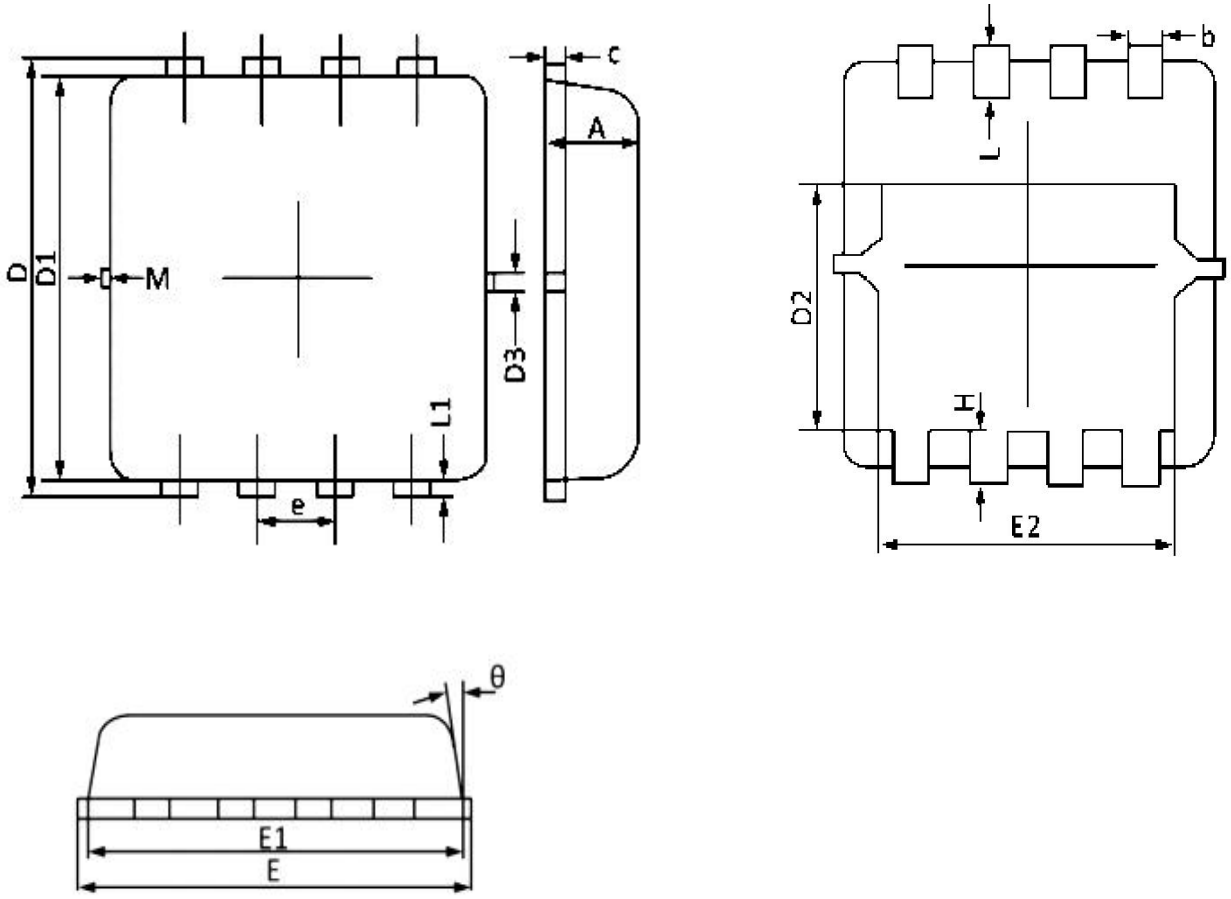


Fig.11 Gate Charge Waveform

PDFN3X3 Package Outline Dimesions



DIMENSIONS(unit:mm)

Symbol	Min	Typ	Max	Sybol	Min	Typ	Max
A	0.70	0.75	0.80	**b**	0.25	0.30	0.35
C	0.10	0.15	0.25	**D**	3.25	3.35	3.45
D1	3.00	3.10	3.20	**D2**	1.78	1.88	1.98
D3		0.13		**E**	3.20	3.30	3.40
E1	3.00	3.15	3.20	**E2**	2.39	2.49	2.59
e	0.65BSC			**H**	0.30	0.39	0.50
L	0.30	0.40	0.50	**L1**		0.13	
θ		10°	12°	**M**	★	★	0.15