

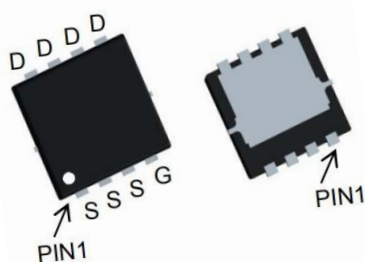
Features

The TWS60N04CC is the high cell density trench N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

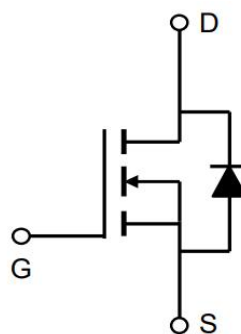
The TWS60N04CC meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary

VDS	40V
ID	60A
RDS(ON) (at VGS =10V)	< 8.5mΩ
RDS(ON) (at VGS =4.5V)	< 15mΩ



PDFN3X3



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	VDS	40	V
Gate-Source Voltage	VGS	±20	
Continuous Drain Current, VGS @ 10V ¹	ID@TC =25°C	60	A
Continuous Drain Current, VGS @ 10V ¹	ID@TC=100°C	35	
Pulsed Drain Current ①	IDM	130	
Single Pulse Avalanche Energy ³	EAS	48	mj
Avalanche Current	IAS	35	A
Power Dissipation ②	PD	39	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	RθJC		3.2	°C/W

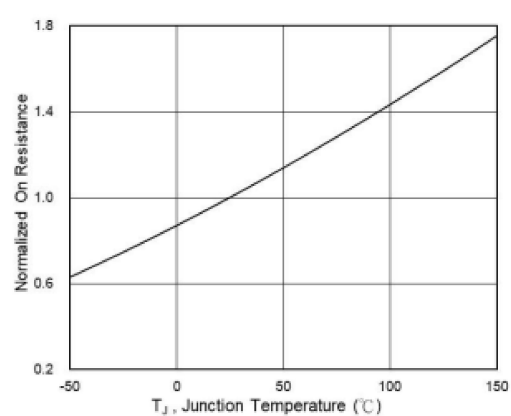
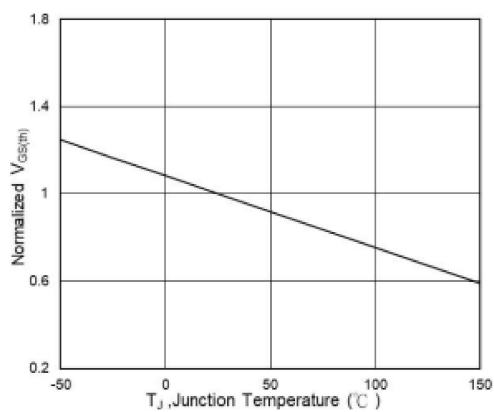
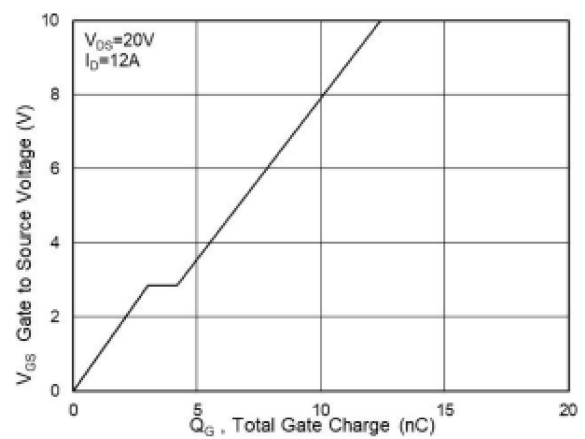
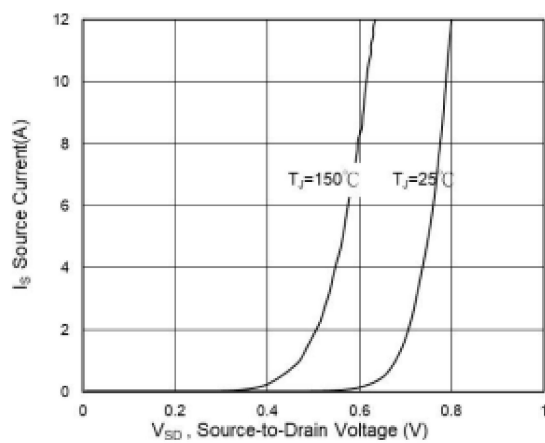
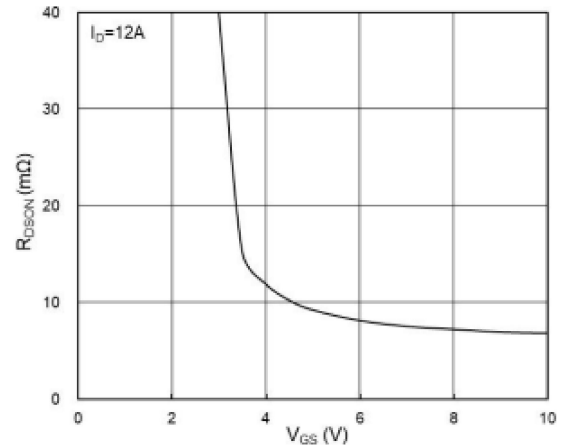
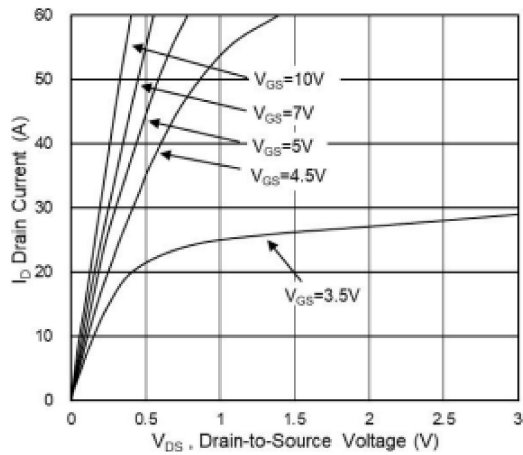
Electrical Characteristics(TJ=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BVDSS	VGS = 0V, ID = 250μA	40			V
Zero Gate Voltage Drain Current	IDSS	VDS = 32V, VGS =0V			1	μA
Gate-Body leakage Current	IGSS	VDS =0V, VGS = ±20V			±100	nA
Gate Threshold Voltage	VGS(th)	VDS =VGS, ID = 250μA	1.35		3	V
Static Drain-Source On-Resistance	RDS(on)	VGS = 10V, ID = 12A		6.9	8.5	mΩ
		VGS = 4.5V, ID = 10A		10.0	15	mΩ
Dynamic Parameters						
Input Capacitance	Ciss	VDS=15V , VGS=0		690		pF
Output Capacitance	Coss			193		pF
Reverse Transfer Capacitance	Crss			38		pF
Total Gate Charge	Qg	VDS=20V , VGS=4.5		5.8		nC
Gate Source Charge	Qgs			3		nC
Gate Drain Charge	Qgd			1.2		nC
Switching Parameters						
Turn-On DelayTime	td(on)	VDD=15V , VGS=10V , RG=3.3Ω ID=1A		14.3		ns
Turn-On Rise Time	tr			5.6		ns
Turn-Off DelayTime	td(off)			20		ns
Turn-Off Fall Time	tf			11		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current		IS			60	A
Drain to Source Diode Forward Voltage	VSD	VGS=0V, IS=30A			1	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



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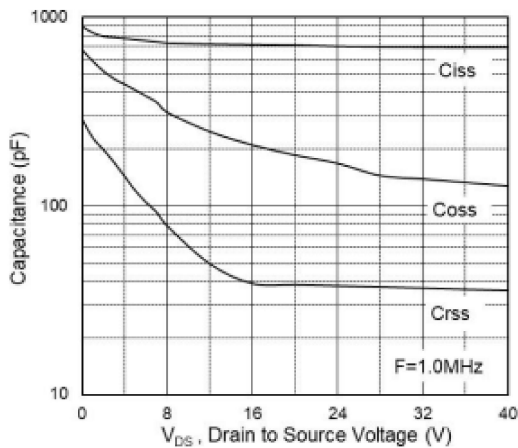


Fig.7 Capacitance

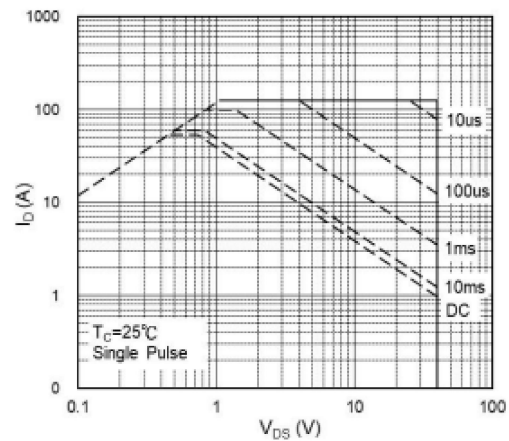


Fig.8 Safe Operating Area

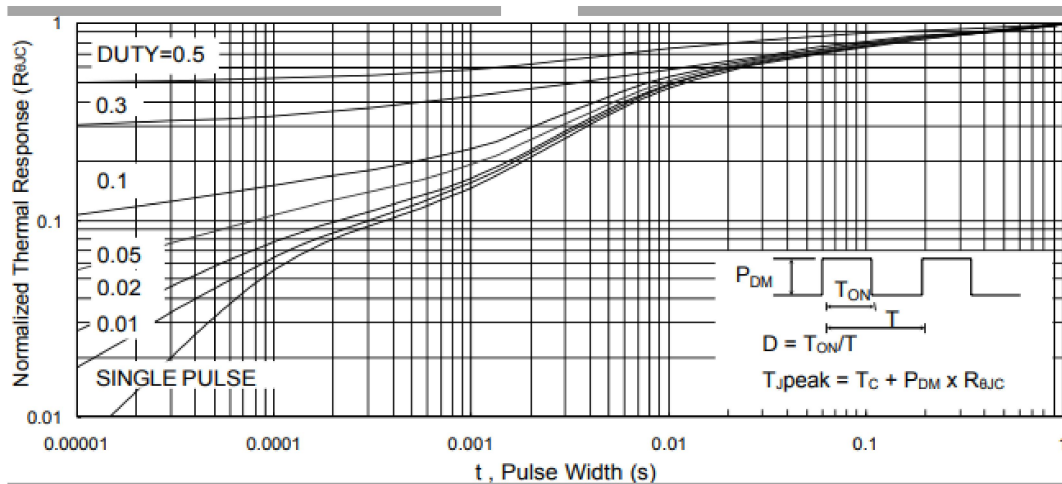


Fig.9 Normalized Maximum Transient Thermal Impedance

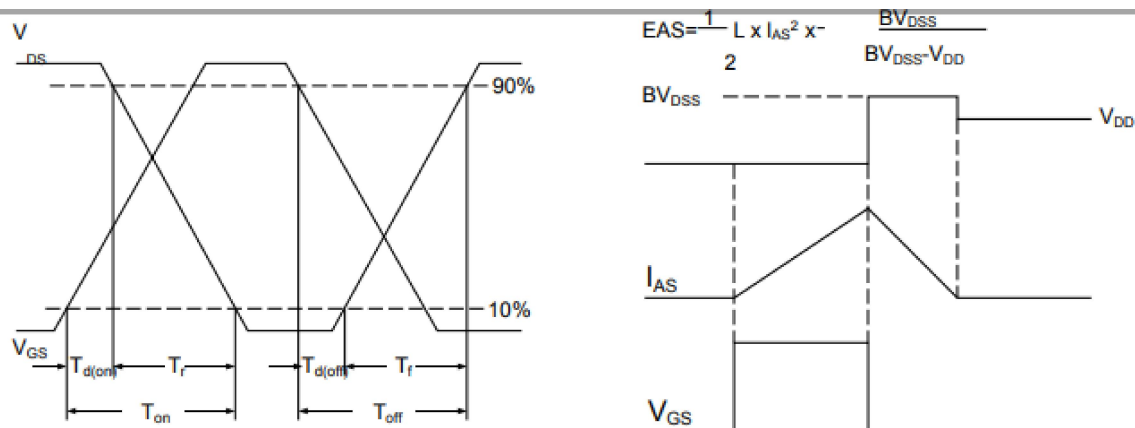


Fig.11 Unclamped Inductive Waveform

Package Information
