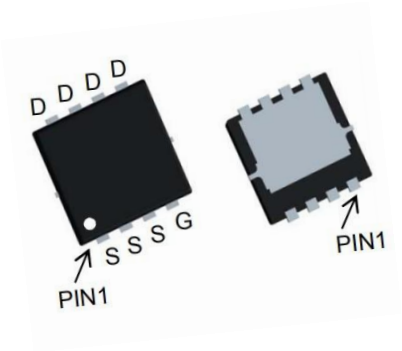
Features

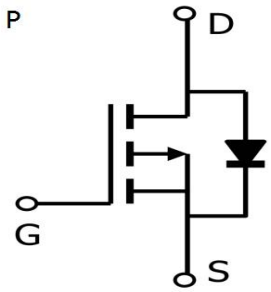
The TW50P03CC is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The TW50P03CC meet the RoHS and Green Product requirement with full function reliability approved.

Product Summary

V_{DS}	-30V
I_D	-50A
$R_{DS(ON)}$ (at V_{GS} =-10V)	< 14mΩ
$R_{DS(ON)}$ (at V_{GS} =-4.5V)	< 28mΩ



PDFN3X3



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	ID@TC =25℃	-50	A
Continuous Drain Current, VGS @ -10V	ID@TC=100℃	-32	
Pulsed Drain Current ①	I_{DM}	-100	
Single Pulse Avalanche Energy3	EAS	125	mJ
Avalanche Current	IAS	-50	A
Total Power Dissipation	PD@TC=25℃	2.0	W
StorageTemperature Range	TSTG	-55 to 150	℃
Operating Junction Temperature	TJ	-55 to 150	℃

Thermal Data

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction-Ambient	RθJA	62	℃/W

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
Zero Gate Voltage Drain Current	I_{DSS}	VDS= -30V, VGS=0V			-1	μA
Gate-Body leakage Current	I_{GSS}	VDS=0V, VGS= ±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID=-250uA	-1.0	-1.6	-2.5	V
Static Drain-Source On-Resistance	RDS(on)	VGS =- 10V, ID = -10A		8.7	14	mΩ
		VGS =- 4.5V, ID = -5A		17	24	mΩ
Dynamic Parameters						
Input Capacitance	C_{iss}	VDS=-15V , VGS=0V , f=1MHz		1770		pF
Output Capacitance	C_{oss}			233		pF
Reverse Transfer Capacitance	C_{rss}			206		pF
Total Gate Charge	Q_g	VDS= -15V, ID= -5A, VGS= -10		22		nC
Gate Source Charge	Q_{gs}			1.0		nC
Gate Drain Charge	Q_{gd}			1.8		nC
Switching Parameters						
Turn-On DelayTime	$t_{d(on)}$	VDD= -15V, ID= -10A, VGS=-10V		9		ns
Turn-On Rise Time	tr			13		ns
Turn-Off DelayTime	$t_{d(off)}$			48		ns
Turn-Off Fall Time	tf			20		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current		IS			-15	A
Maximum Pulsed Drain to Source Diode Forward Current		ISM			-60	A
Drain to Source Diode Forward Voltage	VSD	VGS=0V , IS=-1A , TJ=25℃		-0.8	-1.2	V
Body Diode Reverse Recovery Time	trr	IF=-10A , dI/dt=100A/μs , TJ =25℃		64		NS
Body Diode Reverse Recovery Charge	Qrr			25		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

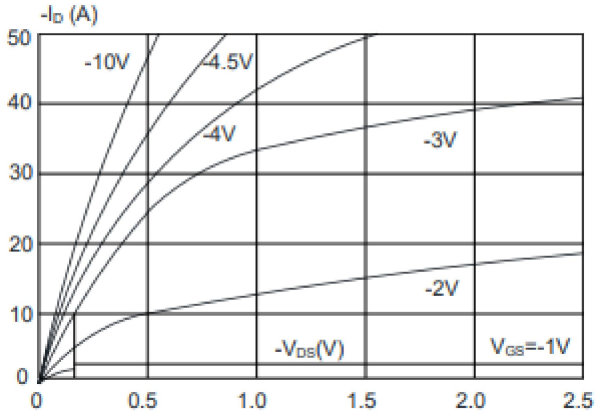


Figure 2: Typical Transfer Characteristics

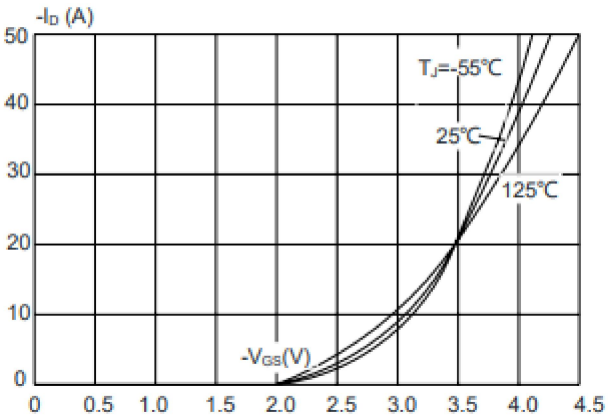


Figure 3: On-resistance vs. Drain Current

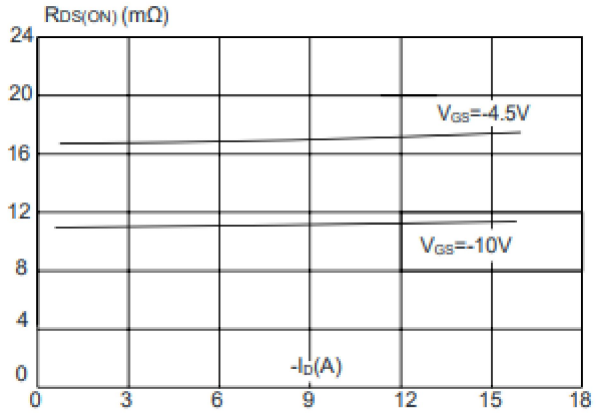


Figure 4: Body Diode Characteristics

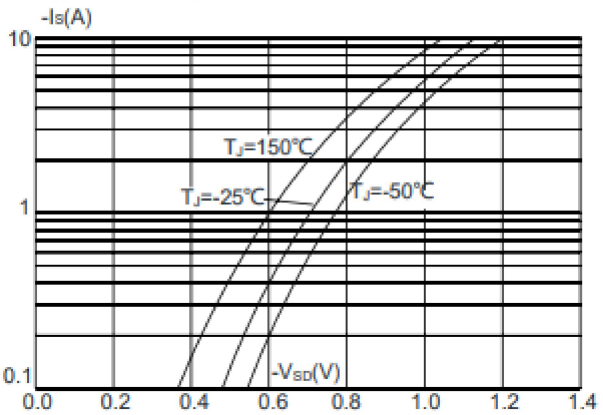


Figure 5: Gate Charge Characteristics

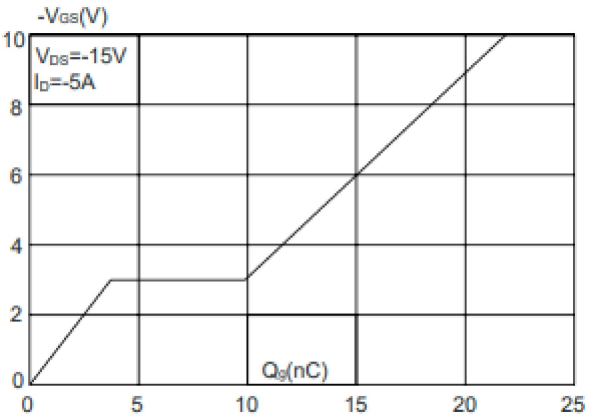
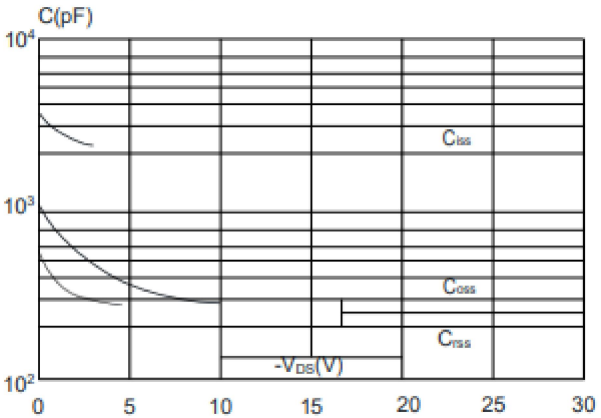


Figure 6: Capacitance Characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

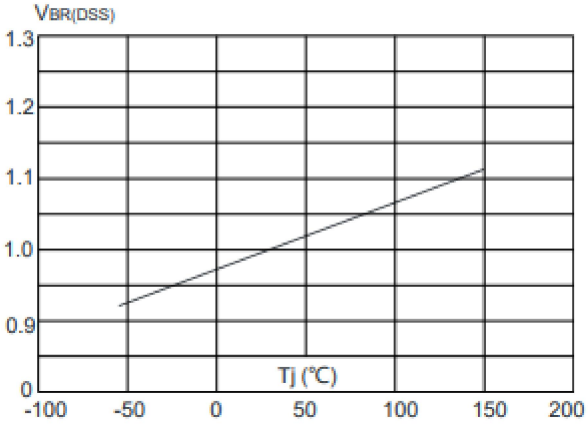


Figure 8: Normalized on Resistance vs. Junction Temperature

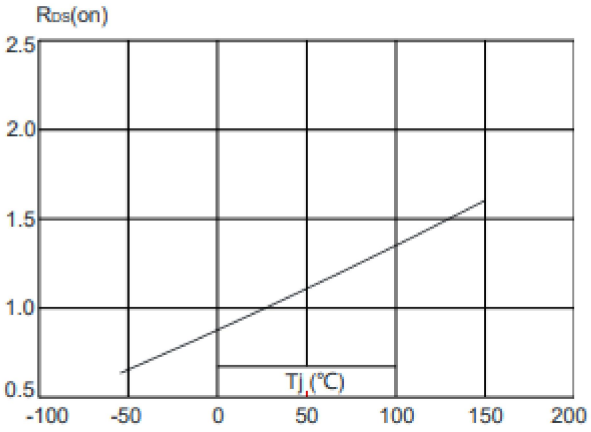


Figure 9: Maximum Safe Operating Area

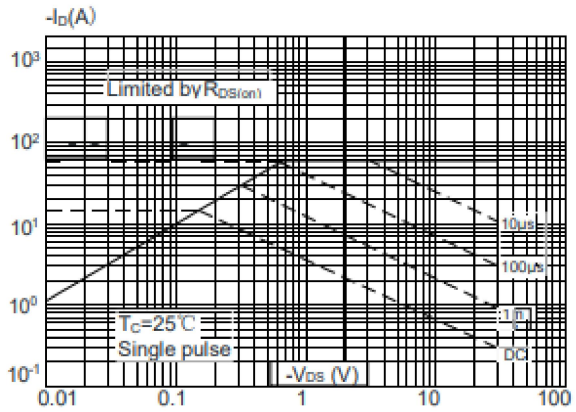


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

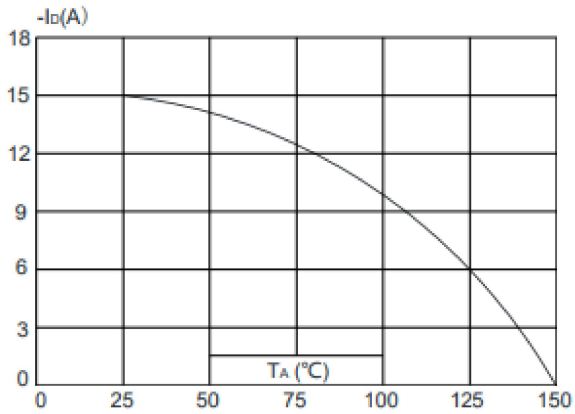
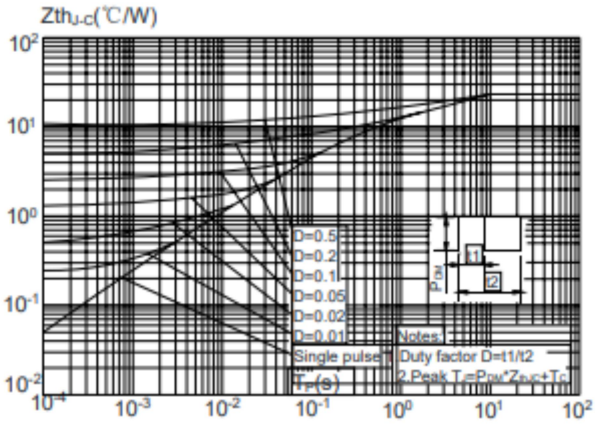
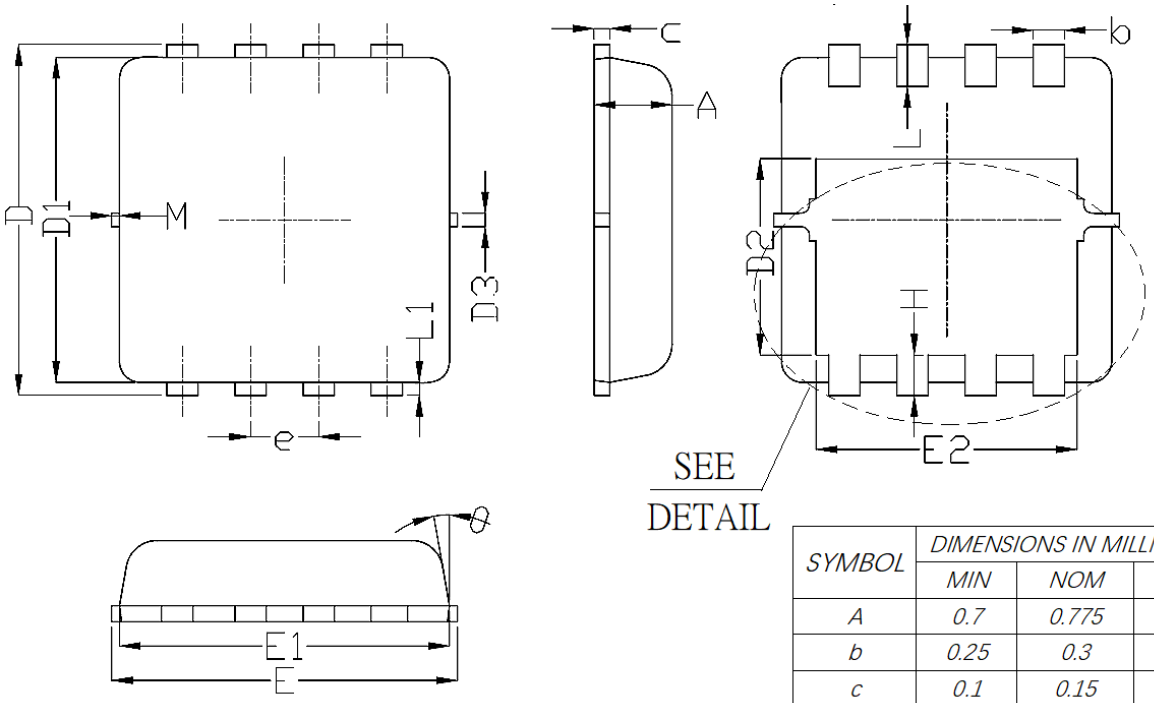
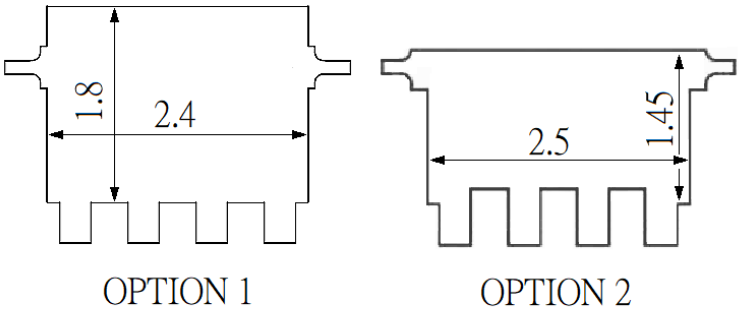


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Information





SYMBOL	DIMENSIONS IN MILLMETERS		
	MIN	NOM	MAX
A	0.7	0.775	0.85
b	0.25	0.3	0.35
c	0.1	0.15	0.25
D	3.15	3.3	3.4
D1	2.95	3.1	3.2
D2	1.7	1.8	1.93
D3		0.13	
E	3.05	3.25	3.35
E1	2.95	3.15	3.2
E2	2.3	2.4	2.55
e	0.65 BSC		
H	0.33	0.43	0.53
L	0.3	0.4	0.5
L1	0.08	0.13	0.18
θ	-	10°	12°
M	-	-	0.15