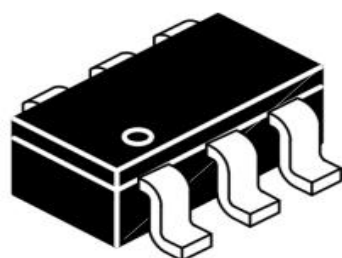


Features

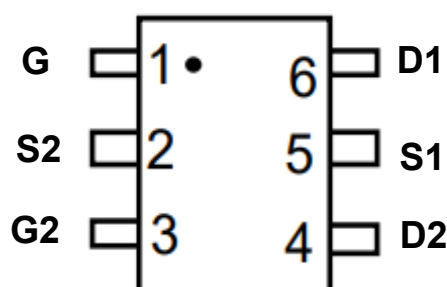
The TW4G02L is the highest performance trench N-ch and P-ch MOSFETs with extreme high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications . The TW4G02L meet the RoHS and Green Product requirement .

Product Summary

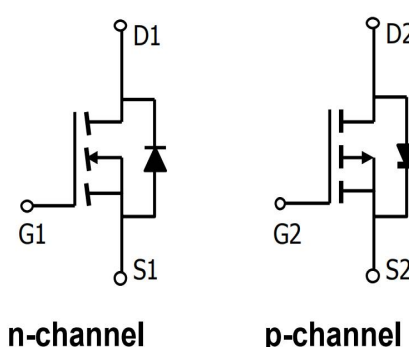
BVDSS	RDSON	ID
20V	40mΩ	3.4A
-20V	90mΩ	-2.5A



PIN1



SOT-23-6L



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

Parameter	Symbol	Max n-channel	Max P-channel	Unit
Drain-Source Voltage	VDS	20	-20	V
Gate-Source Voltage	VGS	±8	±8	
Continuous Drain Current ,VGS @ 10V ¹	ID@TC=25°C	3.4	-2.5	A
Continuous Drain Current ,VGS @ 10V ¹	ID@TC=100°C	3	-2	A
Pulsed Diode Current	IDM	13	-13	A
Single Pulse Avalanche Energy	EAS	50	40	mJ
Avalanche Current	IAS	15	-13	A
Power Dissipation	PD	1.1	1.1	W
Operating Junction	TJ	150	150	°C
Storage Temperature	TSTG	-55~+150	-55~+150	°C

Thermal Data

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-Ambient	RθJA		125	°C/W
Thermal Resistance Junction-Case	RθJC		80	°C/W

N-channel MOSFET Electrical Characteristics (Ta = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BVDSS	VGS = 0V, ID = 250μA	20			V
Gate Threshold Voltage	VGS(th)	VDS =VGS, ID = 250μA	0.4	0.7	1	V
Gate-Body leakage Current	IGSS	VDS =0V, VGS = ±12V			±100	nA
Zero Gate Voltage Drain Current	IDSS	VDS = 20V, VGS =0V			1	μA
Static Drain-Source On-Resistance	RDS(on)	VGS = 4.5V, ID = 2.8A		25	40	mΩ
		VGS = 2.5V, ID = 2A		37	50	mΩ
Diode Forward Voltage	VSD	IS= 4A,VGS=0V			1.2	V
Dynamic Parameters						
Input Capacitance	Ciss	VDS=10V, VGS=0V, f=1.0MHz		358		pF
Output Capacitance	Coss			69.3		pF
Reverse Transfer Capacitance	Crss			58.5		pF
Total Gate Charge	Qg	VDS=10V, ID=2A, VGS=4.5V		5.6		nC
Gate Source Charge	Qgs			0.8		nC
Gate Drain Charge	Qgd			1		nC
Switching Parameters						
Turn-On DelayTime	td(on)	VDS=10V, ID=4A, RGEN=3Ω, VGS=4.5V		5		ns
Turn-On Rise Time	tr			30		ns
Turn-Off DelayTime	td(off)			48		ns
Turn-Off Fall Time	tf			36		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward		IS			1.5	A
Maximum Pulsed Drain to Source Diode Forward Current		ISM			12	A

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.

N-channel Typical Electrical AND Thermal Characteristics:

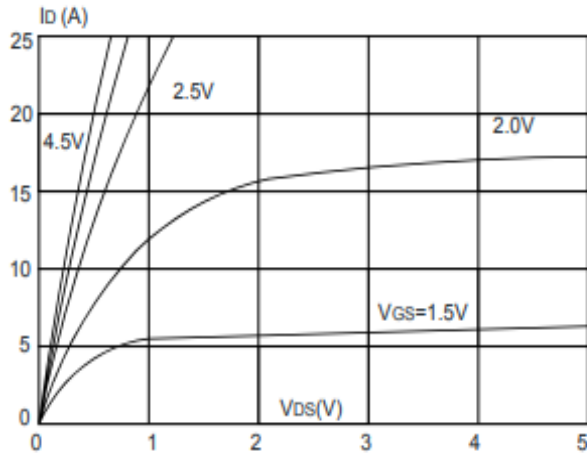


Figure 2: Typical Transfer Characteristics

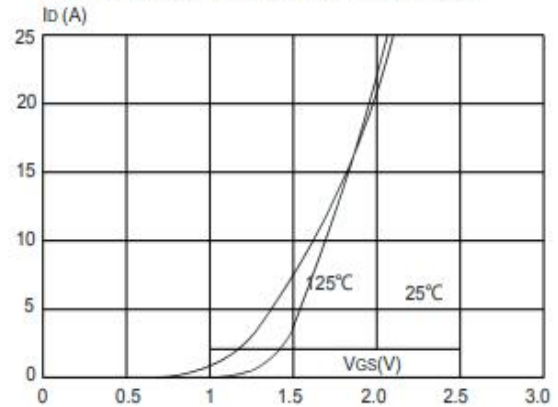


Figure 3: On-resistance vs. Drain Current

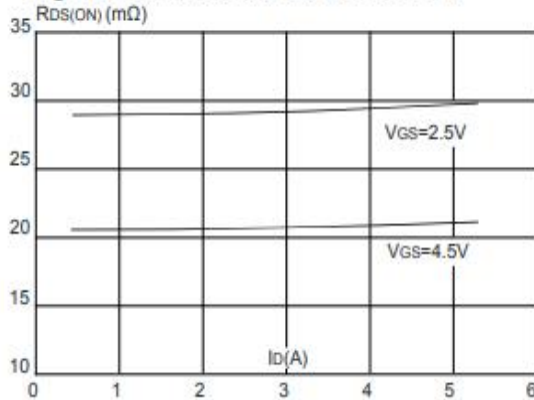


Figure 4: Body Diode Characteristics

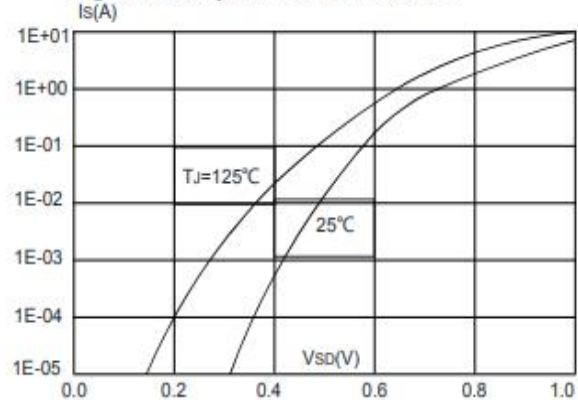


Figure 5: Gate Charge Characteristics

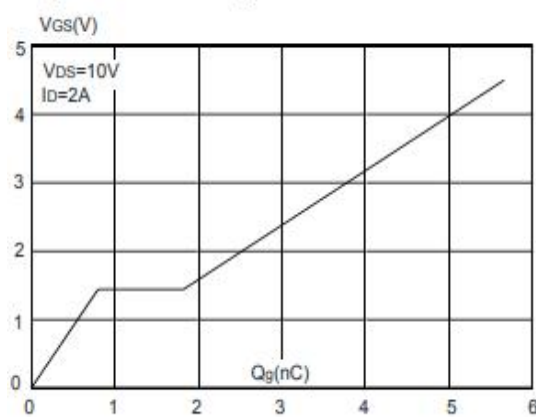
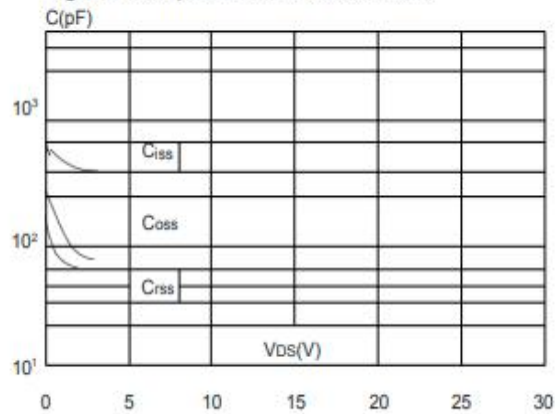


Figure 6: Capacitance Characteristics



P-channel MOSFET Electrical Characteristics (Ta = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	V(BR)DSS	VGS = 0V, ID = -250μA	-20			V
Gate Threshold Voltage	VGS(th)	VDS =VGS, ID = -250μA	-0.5	-0.7	-1.0	V
Gate-Body leakage Current	IGSS	VDS =0V, VGS = ±12V			±100	nA
Zero Gate Voltage Drain Current	IDSS	VDS = -20V, VGS =0V			-1	μA
Static Drain-Source On-Resistance	RDS(on)	VGS = -4.5V, ID = -2.8A		69	90	mΩ
		VGS = -2.5V, ID = -2A		93	115	mΩ
Diode Forward Voltage	VSD	IS= -3A,VGS=0V			-1.2	V
Dynamic Parameters						
Input Capacitance	Ciss	VDS= -10V, VGS=0V, f=1.0MHz		5.3		pF
Output Capacitance	Coss			67		pF
Reverse Transfer Capacitance	Crss			58		pF
Total Gate Charge	Qg	VDS= -10V, ID= -2A, VGS= -4.5V		4.1		nC
Gate Source Charge	Qgs			0.8		nC
Gate Drain Charge	Qgd			1.1		nC
Switching Parameters						
Turn-On DelayTime	td(on)	VDD= -10V, ID= -3A, RG=1Ω, VGEN= -4.5V, RL=1.2		11		ns
Turn-On Rise Time	tr			52		ns
Turn-Off DelayTime	td(off)			16		ns
Turn-Off Fall Time	tf			10		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current		IS			-1.5	A
Maximum Pulsed Drain to Source Diode Forward Curren		ISM			-10	A

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.

P-channel Typical Electrical AND Thermal Characteristics:

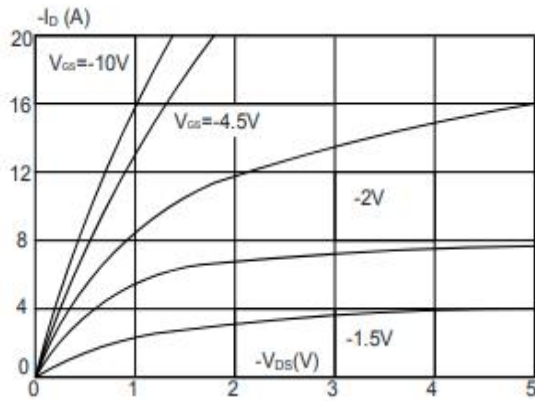


Figure 3: On-resistance vs. Drain Current

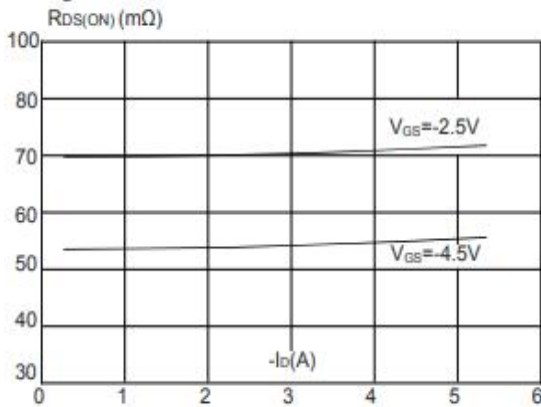


Figure 5: Gate Charge Characteristics

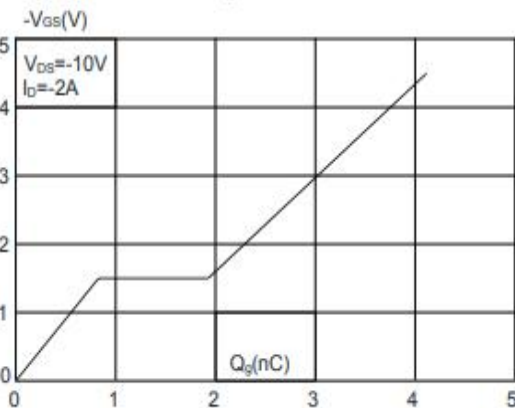


Figure 2: Typical Transfer Characteristics

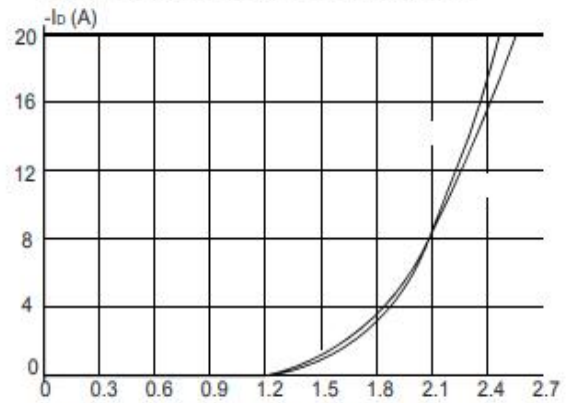


Figure 4: Body Diode Characteristics

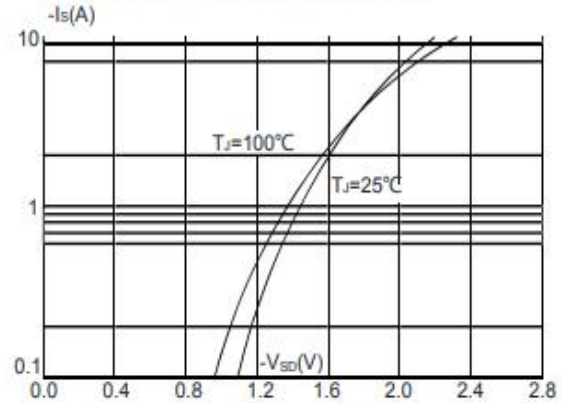
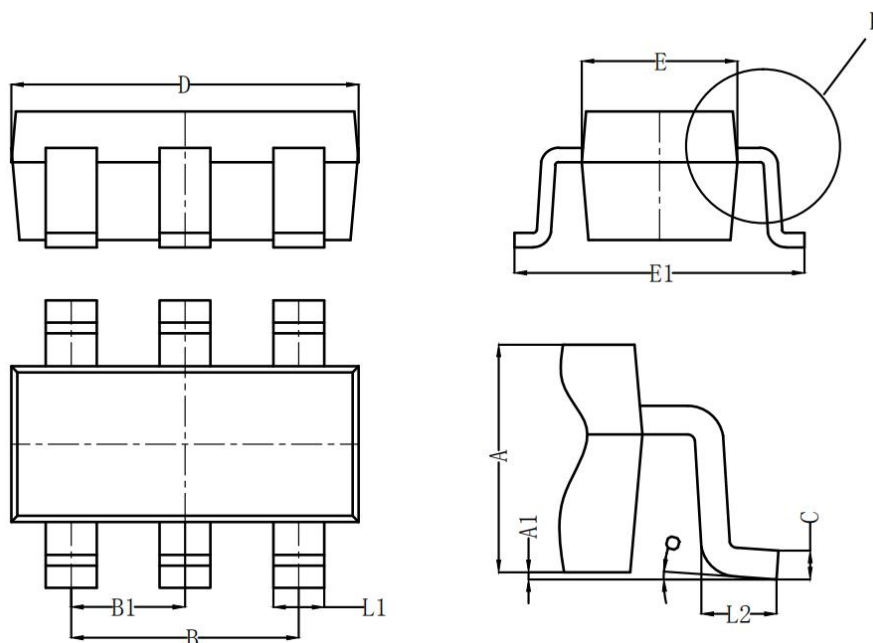


Figure 6: Capacitance Characteristics

SOT23-6L Package outline



Symbol	Dimensions (mm)		
	Min	Typ	Max
A	1.050	1.100	1.150
A1	0.000	0.050	0.100
L1	0.300	0.400	0.500
C	0.100	0.150	0.200
D	2.820	2.920	3.020
E	1.500	1.600	1.700
E1	2.650	2.800	2.950
B	1.800	1.900	2.000
B1	0.950 Typ		
L2	0.300	0.450	0.600
O	0°	4°	8°