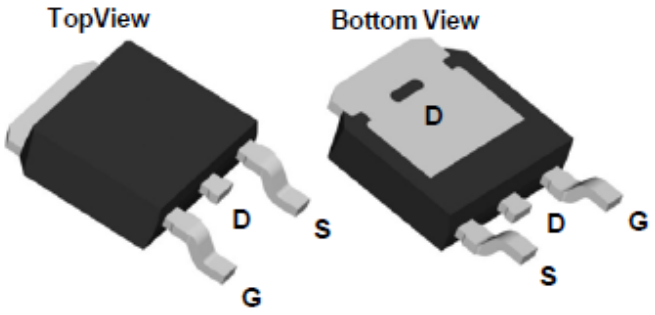
Features

The TW50P06D is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications

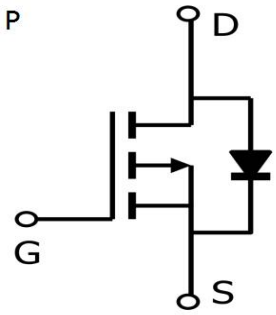
The TW50P06D meet the RoHS and GreeProduct requirement 100% EAS guaranteed with full function reliability approved.

Product Summary

BVDSS	RDSON	ID
-60V	23mΩ	-50A



TO-252-2L



Maximum Ratings(Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	VDS	-60	V
Gate-Source Voltage	VGS	±20	
Continuous Drain Current, -VGS@ -10V[1]	ID@TC=25℃	-50	A
Continuous Drain Current, -VGS@ -10V[1]	ID@TC =100℃	-27	
Pulsed Drain Current [2]	IDM	-150	
Single Pulse Avalanche Energy	EAS	113	mJ
Avalanche Current	IAS	47.6	A
Total Power Dissipation	PD@TA=25℃	52.1	W
Storage Temperature Range	TSTG	-55 to 150	℃
Operating Junction Temperature Range	TJ	-55 to 150	
Thermal Data			
Parameter	**Symbol**	**Max.**	**Unit**
Thermal Resistance Junction-ambient	RθJA	62	℃/W
Thermal Resistance Junction-Case	RθJC	2.4	

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	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	VDS =VGS, ID = -250μA	-1	-1.6	-2.5	V
Gate-Body leakage Current	I_{GSS}	VDS =0V, VGS = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	VDS=-48V , VGS=0V , TJ=25℃			1	μA
Static Drain-Source On-Resistance	$R_{DS(on)}$	VGS = -10V, ID = -18A		23	27	mΩ
		VGS = -4.5V, ID = -12A		26	33	mΩ
Dynamic Parameters						
Input Capacitance	C_{iss}	VDS=-15V , VGS=0V , f=1MHz		3635		pF
Output Capacitance	C_{oss}			224		pF
Reverse Transfer Capacitance	C_{rss}			141		pF
Total Gate Charge	Q_g	VDS=-20V , VGS=-4.5V , ID=-12A		25		nC
Gate Source Charge	Q_{gs}			6.7		nC
Gate Drain Charge	Q_{gd}			5.5		nC
Switching Parameters						
Turn-On DelayTime	$t_{d(on)}$	VDD=-15V , VGS=-10V , RG=3.3Ω, ID=-1A		38		ns
Turn-On Rise Time	tr			23.6		ns
Turn-Off DelayTime	td(off)			100		ns
Turn-Off Fall Time	tf			6.8		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current[1,4]	IS	VG=VD=0V , Force Current			-50	A
Pulsed Source Current[2,4]	ISM				-150	
Diode Forward Voltage[2]	VSD	VGS=0V , IS=-1A , TJ=25℃			-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

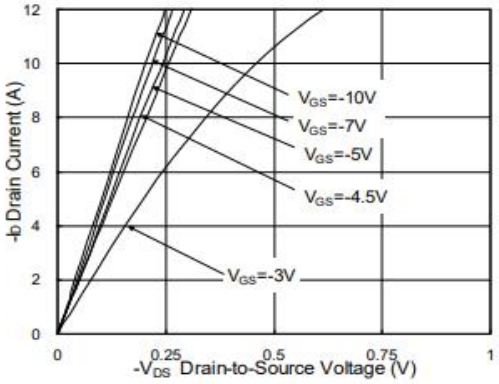


Fig.1 Typical Output Characteristics

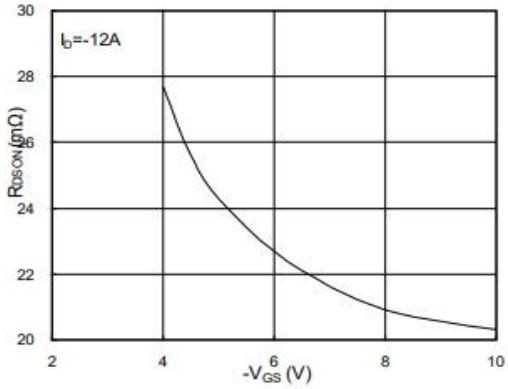


Fig.2 On-Resistance v.s Gate-Source

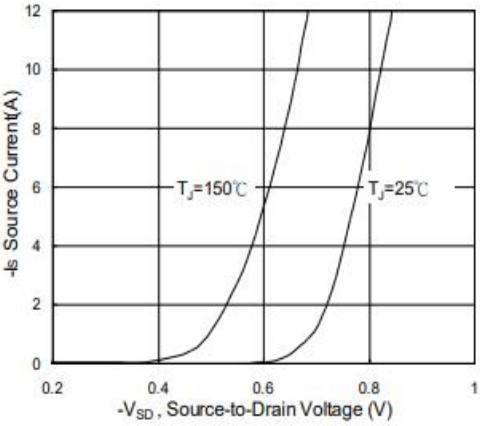


Fig.3 Forward Characteristics Of Reverse

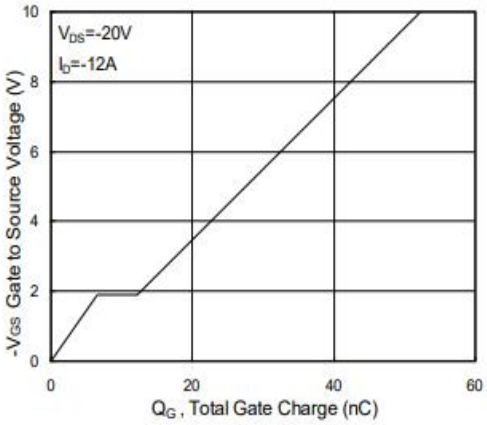


Fig.4 Gate-Charge Characteristics

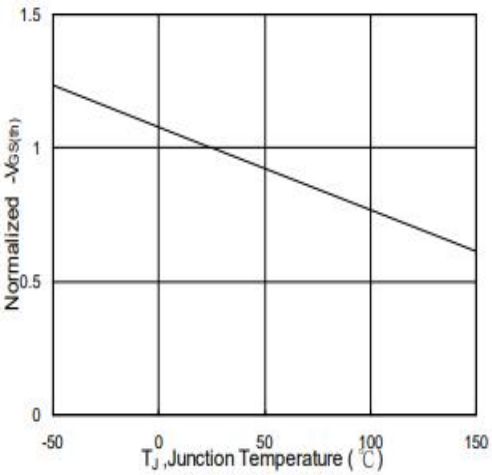


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

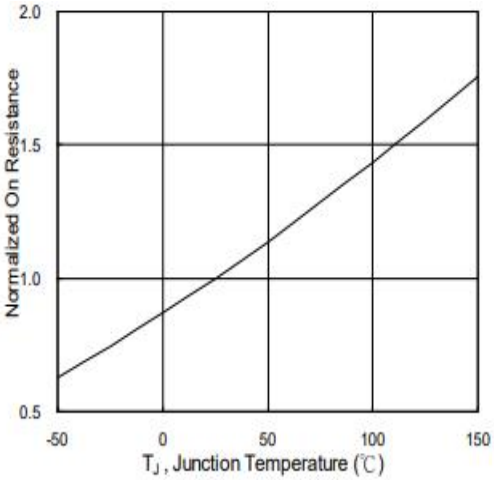


Fig.6 Normalized R_{DSON} v.s T_J

Typical Electrical and Thermal Characteristics

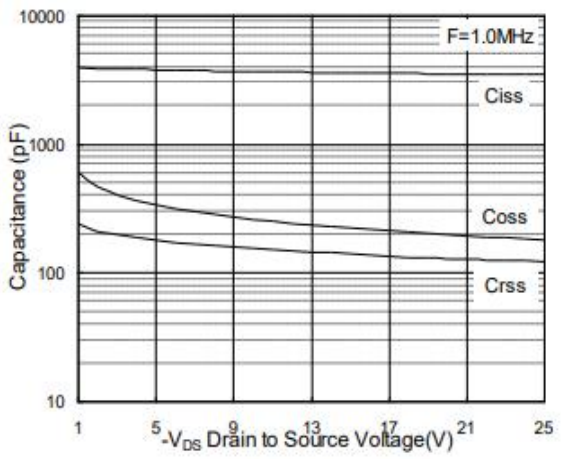


Fig.7 Capacitance

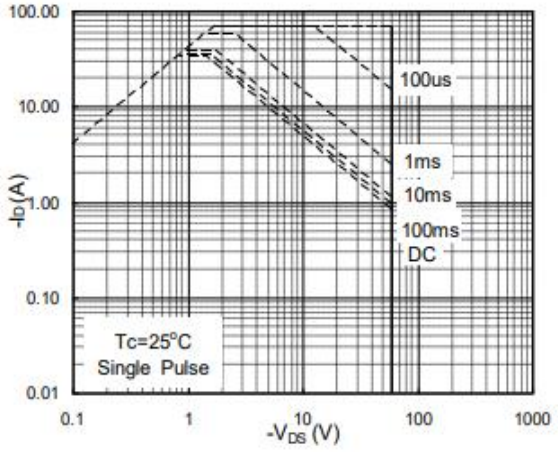


Fig.8 Safe Operating Area

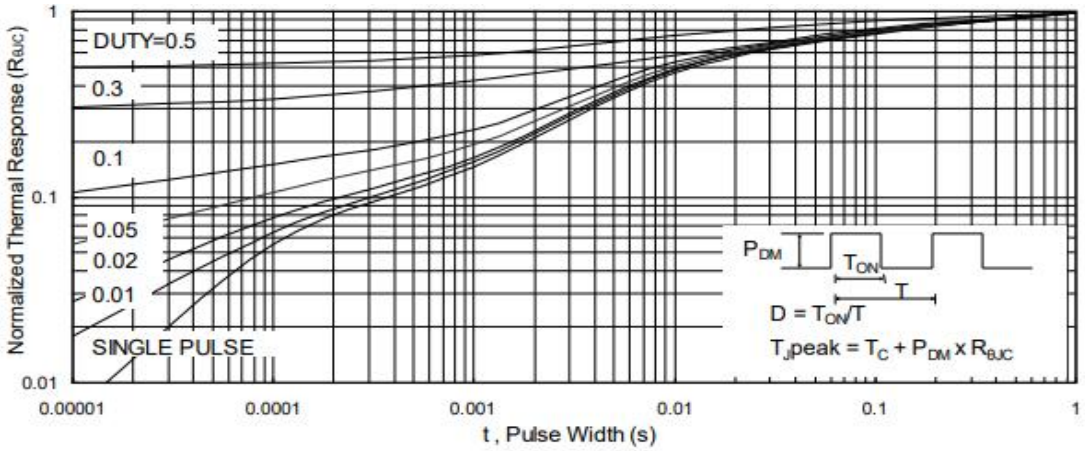


Fig.9 Normalized Maximum Transient Thermal Impedance

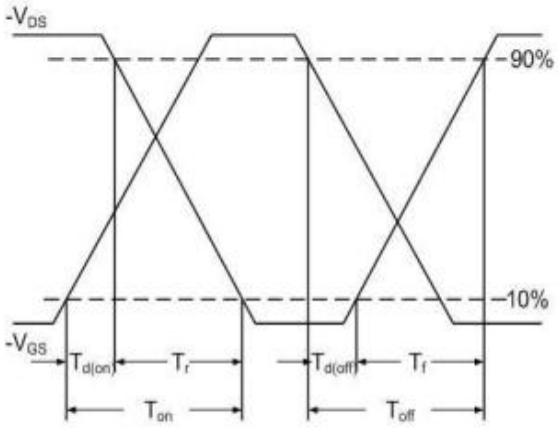


Fig.10 Switching Time Waveform

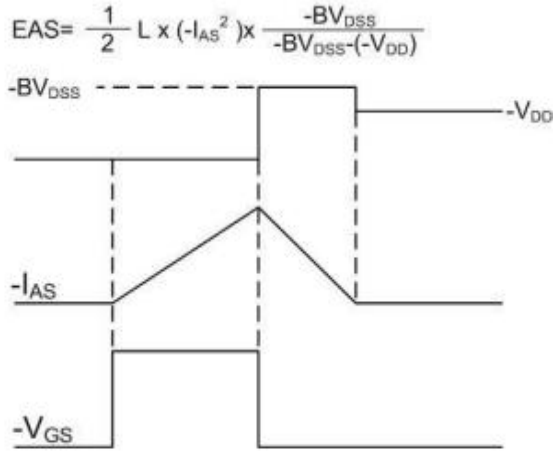
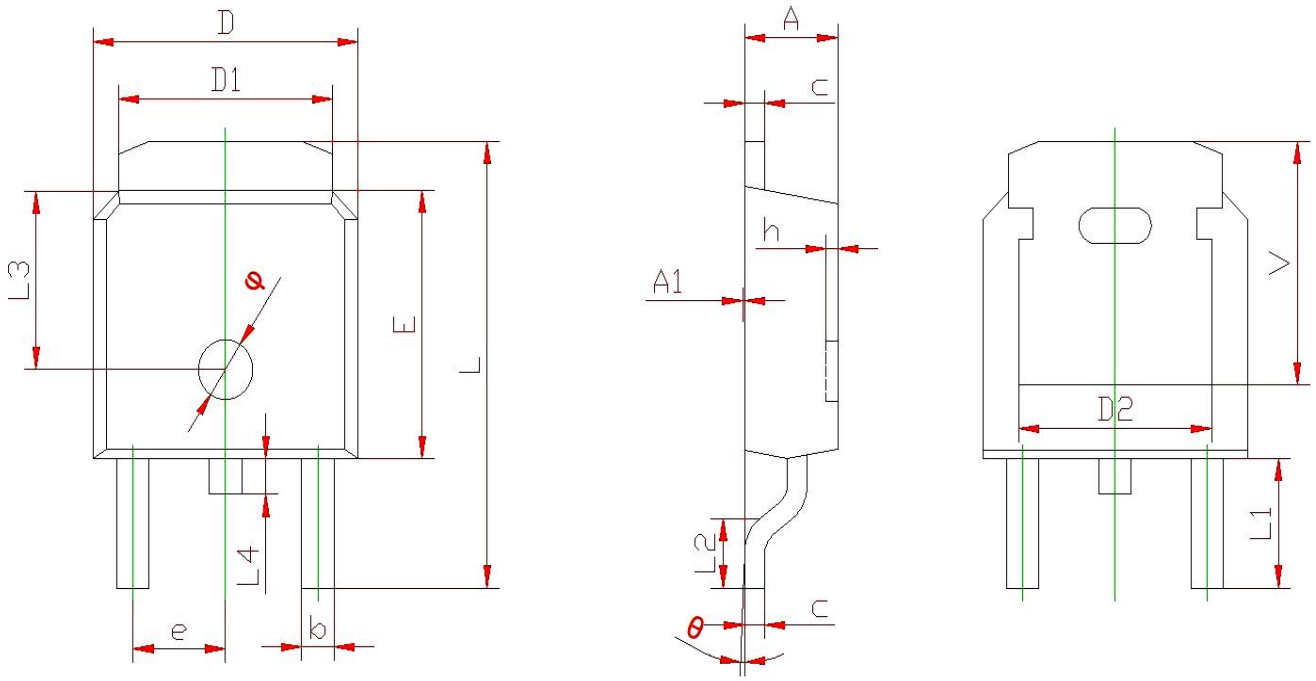


Fig.11 Unclamped Inductive Waveform

TO-252 Package Outline Dimesions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.800 REF		0.189 REF	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF		0.114 REF	
L2	1.400	1.700	0.055	0.067
L3	4.000REF		0.157 REF	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.0.43	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.5000REF		0.217 REF	