

## General Description

The WSF40P06 is the highest performance trench P-ch MOSFETs with extreme high cell density, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

The WSF40P06 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

## Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

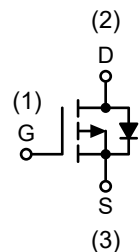
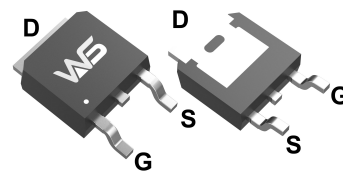
## Product Summary

BVDSS	RDS(on)	ID
-60V	55mΩ	-17A

## Applications

- Brushless motor
- Load switch
- Uninterruptible power supply

## TO-252-2L Pin Configuration



## ABSOLUTE MAXIMUM RATINGS (Tc = 25 °C Unless Otherwise Noted)

SYMBOL	PARAMETERS/TEST CONDITIONS		LIMITS	UNIT
VDS	Drain - Source Voltage		-60	V
VGS	Gate-Source Voltage		±20	
ID	Continuous Drain Current	Tc = 25 °C	-17	A
		Tc = 100 °C	-11	
IDM	Pulsed Drain Current <sup>1</sup>		-60	
IAS	Avalanche Current		-12	
EAS	Avalanche Energy	L = 0.1mH	7.2	mJ
EAR	Repetitive Avalanche Energy <sup>2</sup>	L = 0.05mH	3.6	
PD	Power Dissipation	Tc = 25 °C	27	W
		Tc = 100 °C	8	
Tj, Tstg	Operating Junction & Storage Temperature Range		-55 to 150	°C

## THERMAL RESISTANCE RATINGS

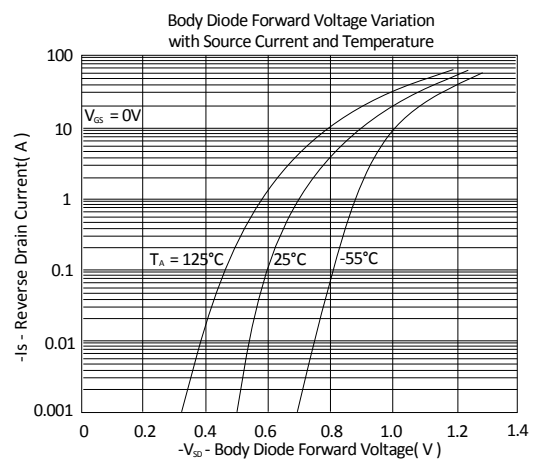
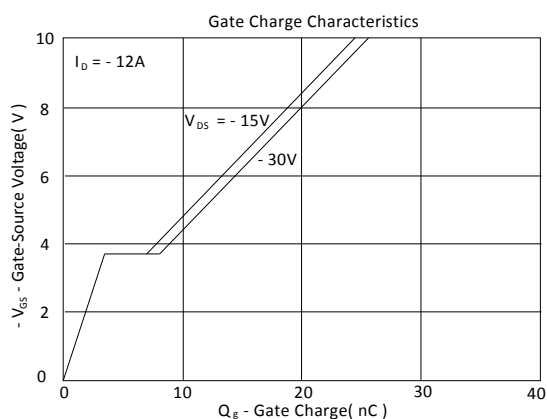
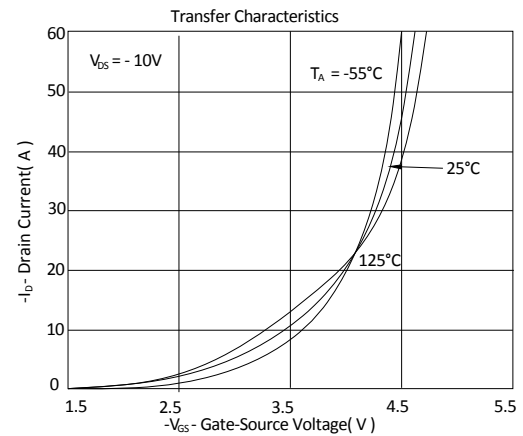
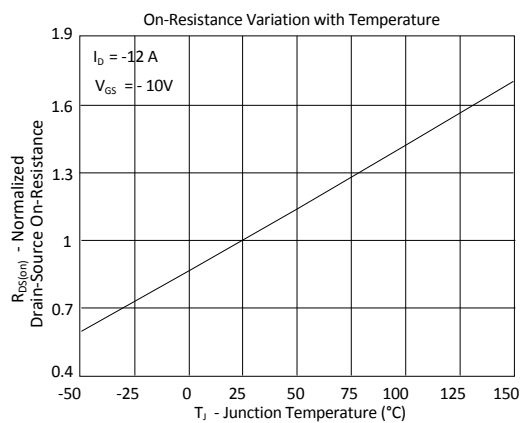
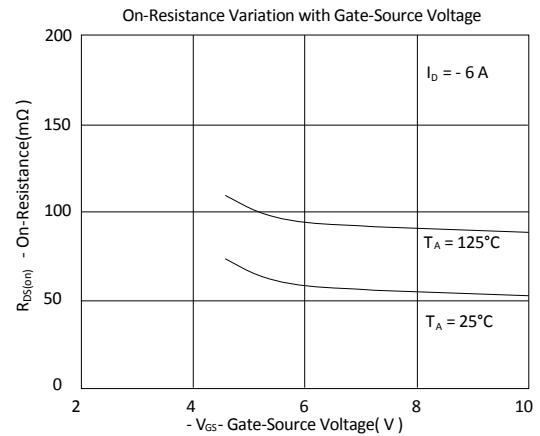
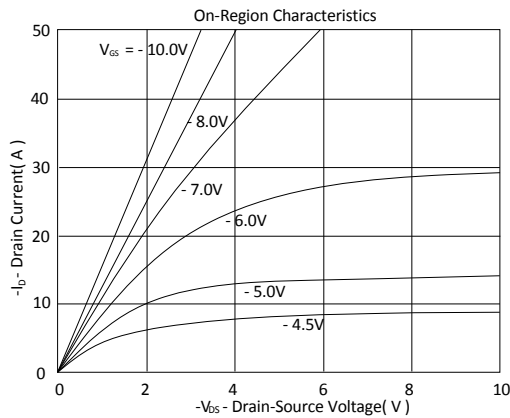
SYMBOL	THERMAL RESISTANCE	MAXIMUM	UNIT
RθJC	Junction-to-Case	4.5	°C / W
RθJA	Junction-to-Ambient	85	

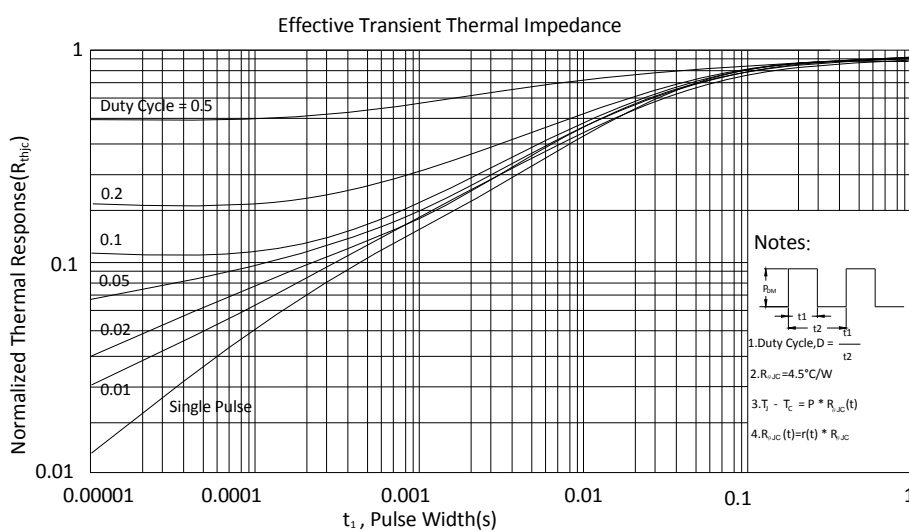
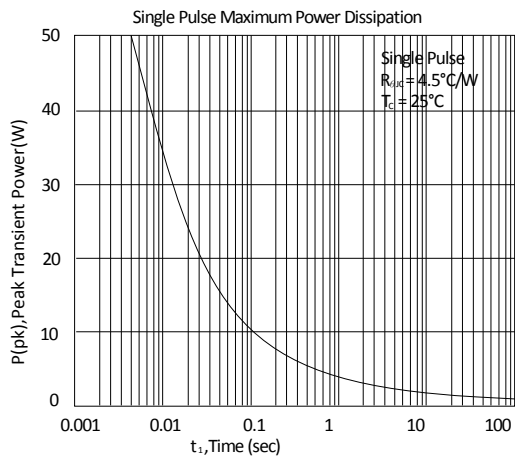
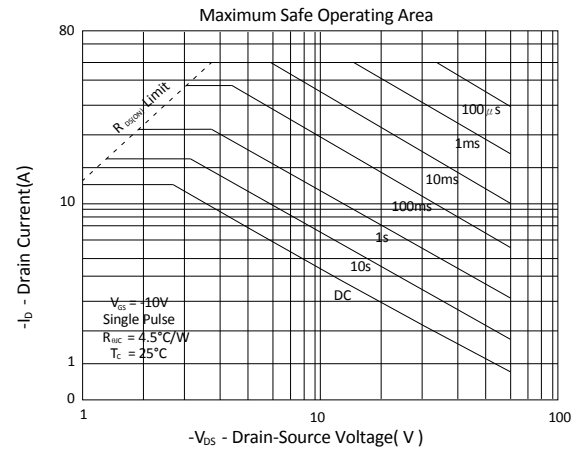
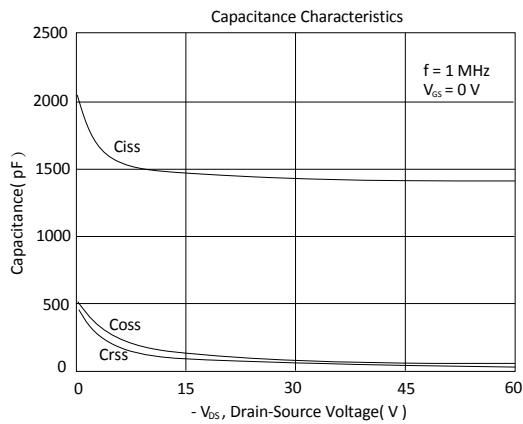
**P-Channel Electrical Characteristics ( $T_J=25\text{ }^{\circ}\text{C}$ , unless otherwise noted)**

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = - 250μA	-60	---	---	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = - 250μA	-1.0	-1.8	-3.0	
I <sub>GSS</sub>	Gate-Body Leakage	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	---	---	±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = -48V, V <sub>GS</sub> = 0V	---	---	-1	μA
		V <sub>DS</sub> = - 40V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125 °C	---	---	-25	
I <sub>D(ON)</sub>	On-State Drain Current 1	V <sub>DS</sub> = -5V, V <sub>GS</sub> = -4.5V	-17	---	---	A
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance1	V <sub>GS</sub> = -10V, I <sub>D</sub> = -15A	---	55	62	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -7A	---	75	90	
g <sub>fs</sub>	Forward Transconductance1	V <sub>DS</sub> = -5V, I <sub>D</sub> = -15A	---	12	---	S
DYNAMIC						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = -25V, f = 1MHz	---	1485	---	pF
C <sub>oss</sub>	Output Capacitance		---	93	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	81	---	
R <sub>g</sub>	Gate Resistance	V <sub>GS</sub> = 15mV, V <sub>DS</sub> = 0V, f = 1MHz	---	7.0	---	Ω
Q <sub>g</sub>	Total Gate Charge1,2	V <sub>DS</sub> = -30V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A	---	25.3	---	nC
Q <sub>gs</sub>	Gate-Source Charge1,2		---	3.2	---	
Q <sub>gd</sub>	Gate-Drain Charge1,2		---	4	---	
t <sub>d(on)</sub>	Turn-On Delay Time1,2	V <sub>DS</sub> = -10V, I <sub>D</sub> = -1A, V <sub>GS</sub> = -10V, R <sub>GS</sub> = 6Ω	---	12	---	nS
t <sub>r</sub>	Rise Time1,2		---	24	---	
t <sub>d(off)</sub>	Turn-Off Delay Time1,2		---	45	---	
t <sub>f</sub>	Fall Time1,2		---	60	---	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T <sub>c</sub> = 25 °C)						
I <sub>S</sub>	Continuous Current		---	---	-17	A
I <sub>SM</sub>	Pulsed Current3		---	---	-60	
V <sub>SD</sub>	Forward Voltage1	I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0V	---	---	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> = - 5A, dI <sub>F</sub> /dt = 100A/μS	---	12	---	nS
Q <sub>rr</sub>	Reverse Recovery Charge		---	9	---	nC

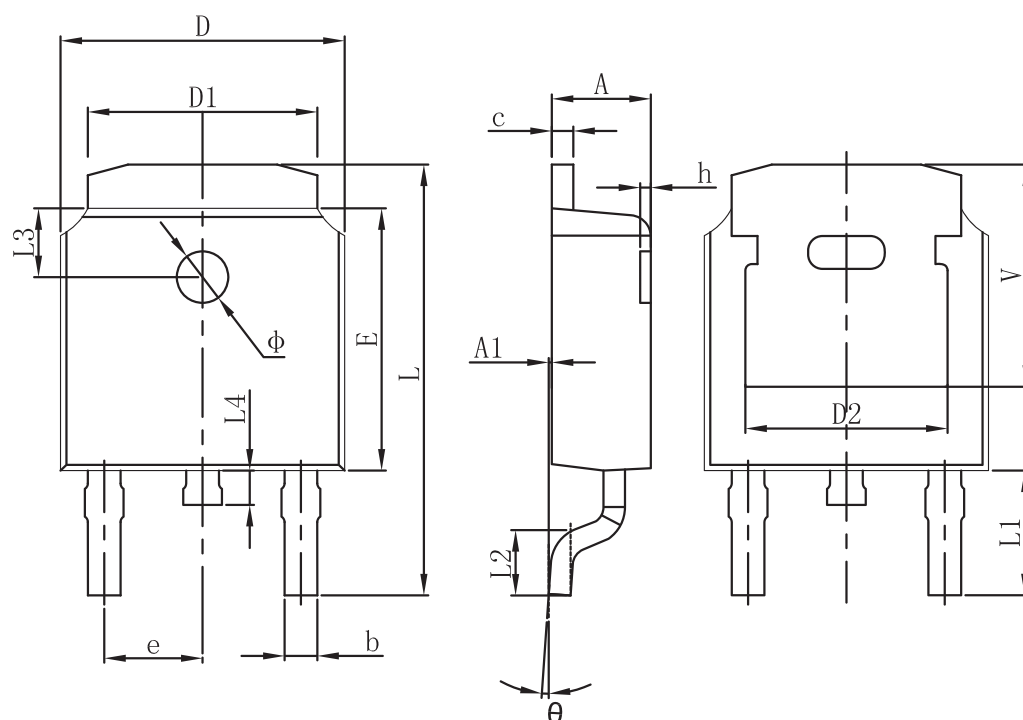
1. Pulse test : Pulse Width  $\leq 300\mu sec$ , Duty Cycle  $\leq 2\%$ .

2. Independent of operating temperature.

**TYPICAL CHARACTERISTICS**




# Packaging information



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	0.635	0.770	0.025	0.030
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	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

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