

General Description

The WSP6044 is the highest performance trench N-ch MOSFETs with extreme high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

Features

Reliable and Rugged

Lead Free and Green Devices Available

(RoHS Compliant)

Product Summary

BVDSS	RDSON	ID
60V	18mΩ	10A

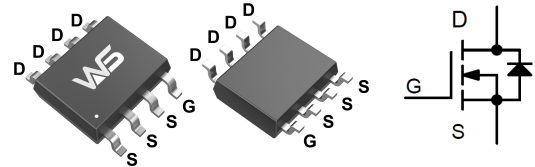
Applications

SMPS Synchronous Rectification.

DC-DC Conversion.

Load Switch.

SOP-8 Pin Configuration



Absolute Maximum Ratings (T= 25°C Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit	
V _{DSS}	Drain-Source Voltage	60	V	
V _{GSS}	Gate-Source Voltage	±20		
T _J	Maximum Junction Temperature	150	°C	
T _{STG}	Storage Temperature Range	-55 to 150		
I _S	Diode Continuous Forward Current	T _A =25°C	5	A
I _D	Continuous Drain Current	T _A =25°C	10	
		T _A =70°C	8	
I _{DM} ^a	Pulsed Drain Current	T _A =25°C	38	
P _D	Maximum Power Dissipation	T _A =25°C	3.5	W
		T _A =70°C	2.2	
RJA ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	35	°C/W
		Steady-State	70	
IAS ^b	Avalanche Current, Single pulse	L=0.1mH	27	A
EAS ^b	Avalanche Energy, Single pulse	L=0.1mH	36	mJ

Note a : Pulse width limited by max. junction temperature.

Note b : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_J=25°C).

Note c: Surface Mounted on 1in2 pad area.

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

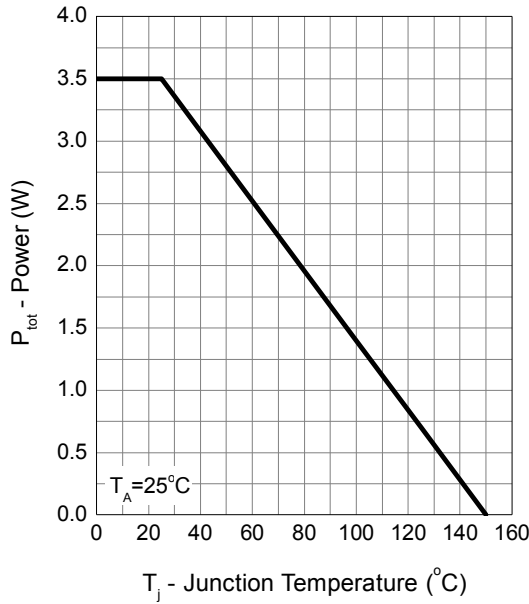
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\text{ A}$	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=48V, V_{GS}=0V$	-	-	1	A
		$T_J=85^\circ\text{C}$	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\text{ A}$	1.4	-	2.4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
$R_{DS(ON)}^d$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=10A$	-	18	25	m Ω
		$V_{GS}=4.5V, I_{DS}=7A$	-	20	30	
V_{SD}^d	Diode Forward Voltage	$I_{SD}=10A, V_{GS}=0V$	-	0.8	1.3	V
t_{rr}	Reverse Recovery Time	$I_{SD}=10A,$ $di_{SD}/dt=100A/\mu s$	-	21	-	ns
Q_{rr}	Reverse Recovery Charge		-	22	-	nC
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$	-	2.5	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=30V,$ $F=1.0\text{MHz}$	-	2370	2780	pF
C_{oss}	Output Capacitance		-	135	-	
C_{rss}	Reverse Transfer Capacitance		-	60	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=30V,$ $R_L=30,$ $I_{DS}=1A,$ $V_{GEN}=10V,$ $R_G=6R$	-	14	26	ns
t_r	Turn-on Rise Time		-	8	15	
$t_{d(OFF)}$	Turn-off Delay Time		-	38	69	
t_f	Turn-off Fall Time		-	12	22	
Q_g	Total Gate Charge	$V_{DS}=30V,$ $V_{GS}=4.5V,$ $I_{DS}=10A.$	-	12	-	nC
Q_g	Total Gate Charge	$V_{DS}=30V,$ $V_{GS}=10V,$ $I_{DS}=10A.$	-	26	37	
Q_{gs}	Gate-Source Charge		-	5	-	
Q_{gd}	Gate-Drain Charge		-	5	-	

Note d : Pulse test ; pulse width 300us, duty cycle $\leq 2\%$.

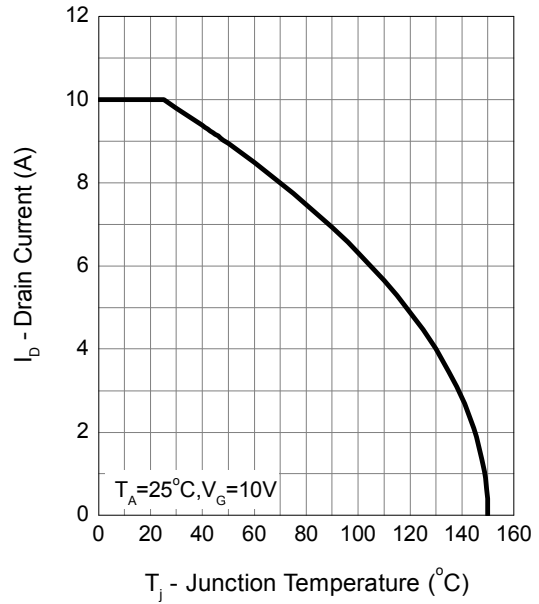
Note e : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

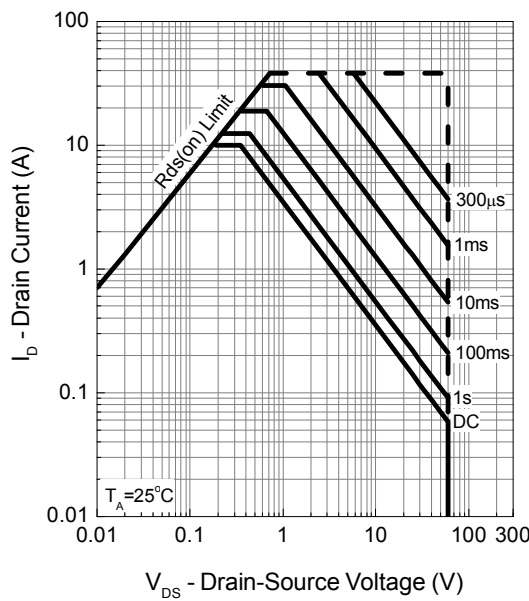
Power Dissipation



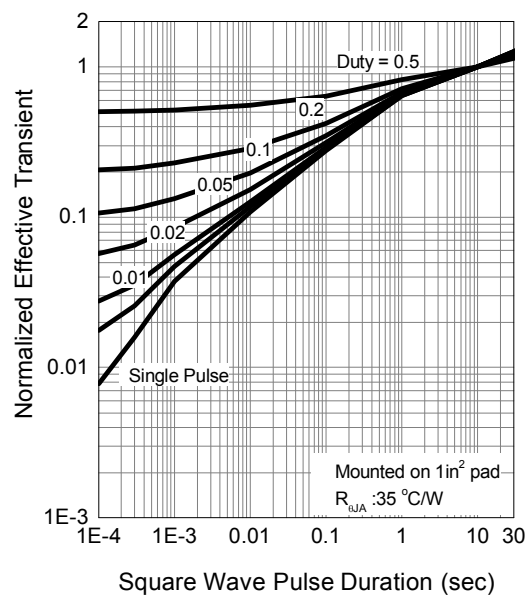
Drain Current



Safe Operation Area

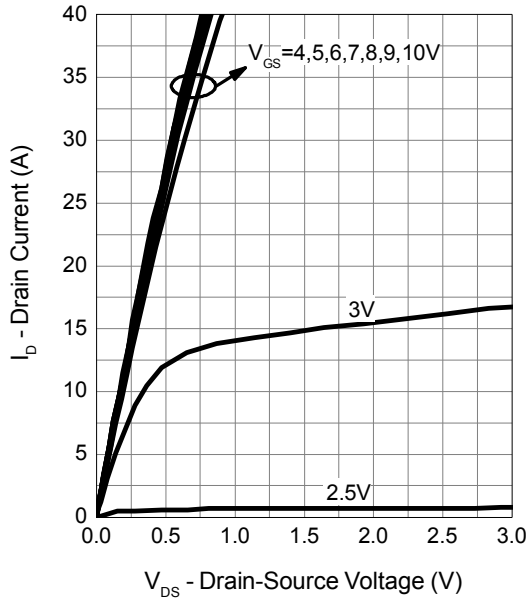


Thermal Transient Impedance

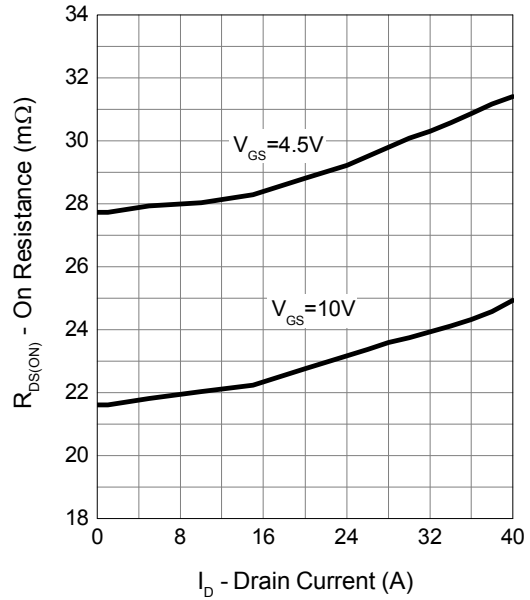


Typical Operating Characteristics (Cont.)

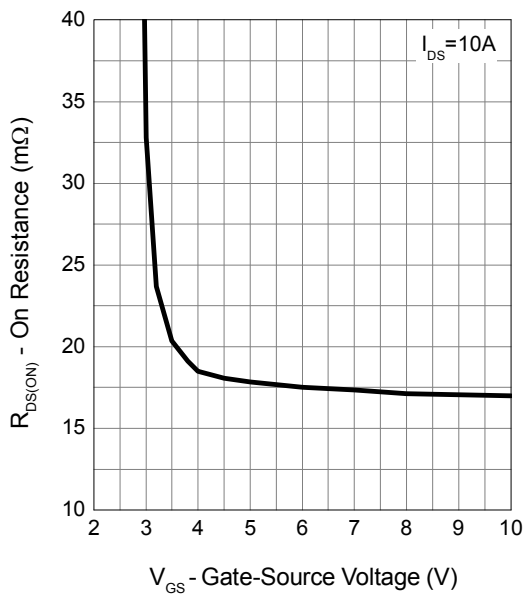
Output Characteristics



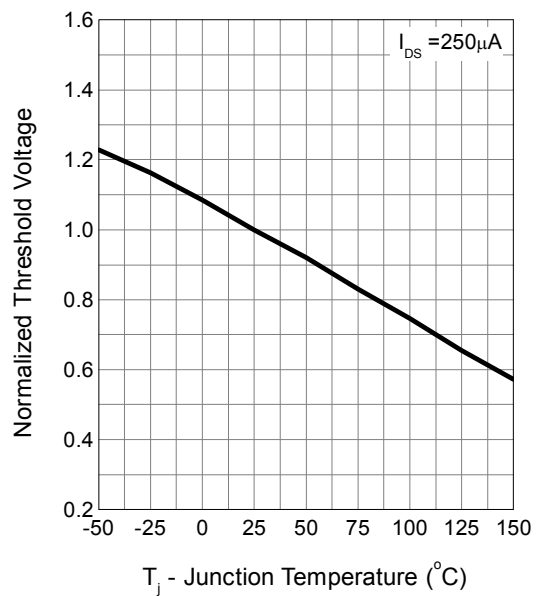
Drain-Source On Resistance



Gate-Source On Resistance

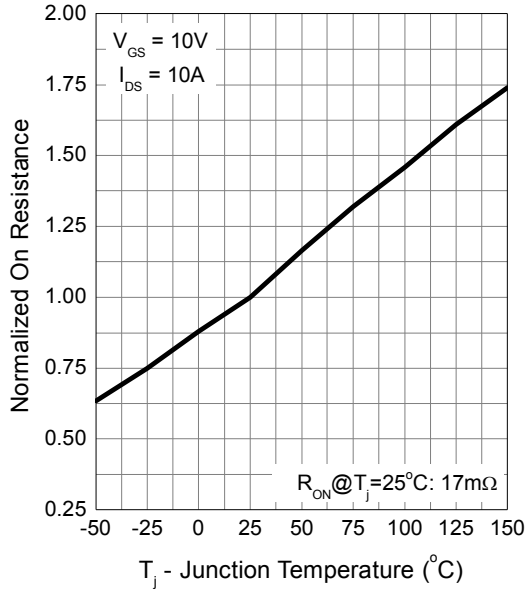


Gate Threshold Voltage

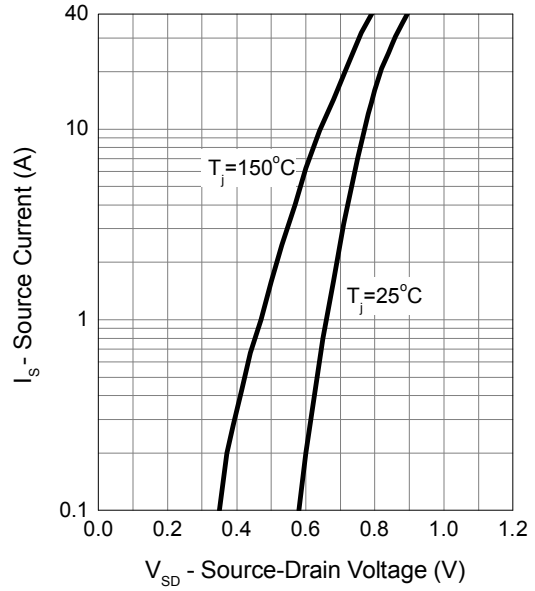


Typical Operating Characteristics (Cont.)

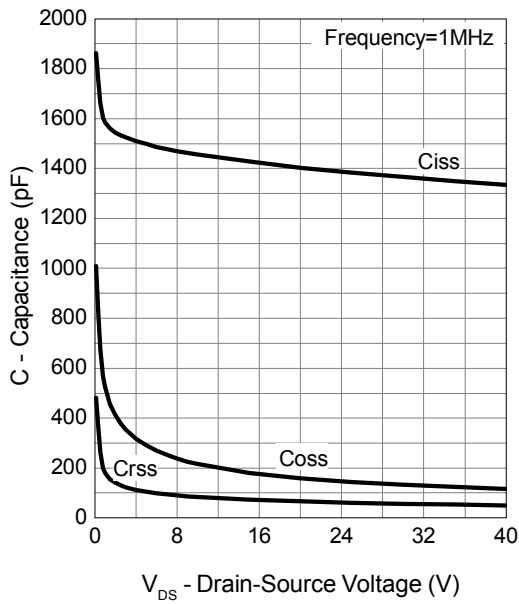
Drain-Source On Resistance



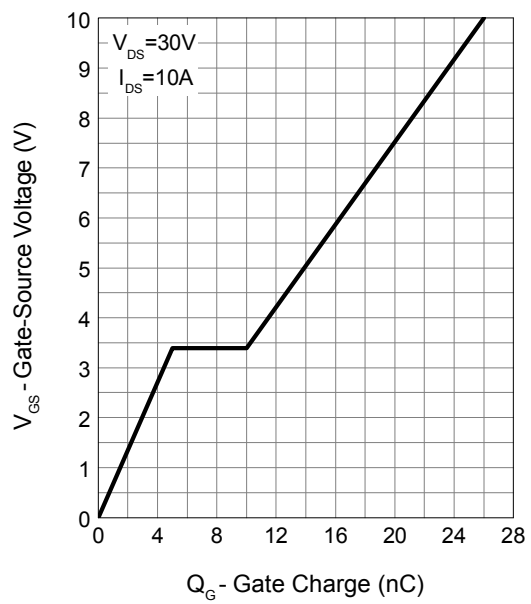
Source-Drain Diode Forward



Capacitance



Gate Charge



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