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 Summery

BVDSS	RDSON	ID
60V	18mΩ	10A

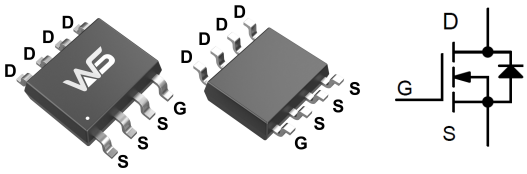
Applications

SMPS Synchronous Rectification.

DC-DC Conversion.

Load Switch.

SOP-8 Pin Configuration



Absolute Maximum Ratings (T= 25℃ 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℃ (initial temperature Tj=25℃).

Note c：Surface Mounted on 1in2 pad area.

Electrical Characteristics (T= 25℃ unless otherwise noted)

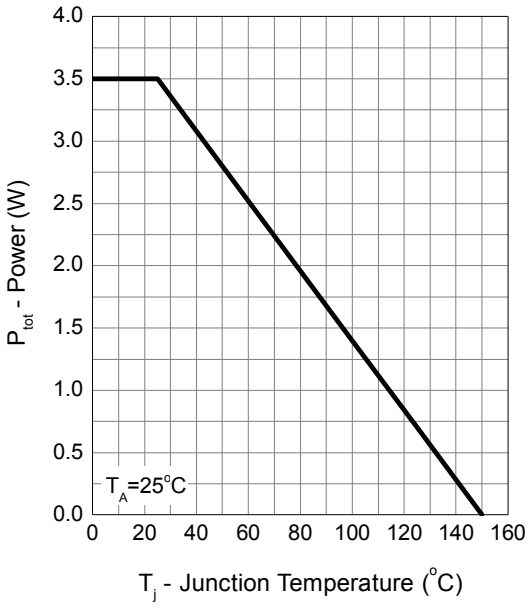
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250 A	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =48V, V_{GS}=0V	-	-	1	A
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS}, I_{DS}=250 A	1.4	-	2.4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$[d]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=10A	-	18	25	mΩ
		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/us	-	21	-	ns
Q_{rr}	Reverse Recovery Charge		-	22	-	nC
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,f=1MHz	-	2.5	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS} =30V, F=1.0MHz	-	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≤2%.

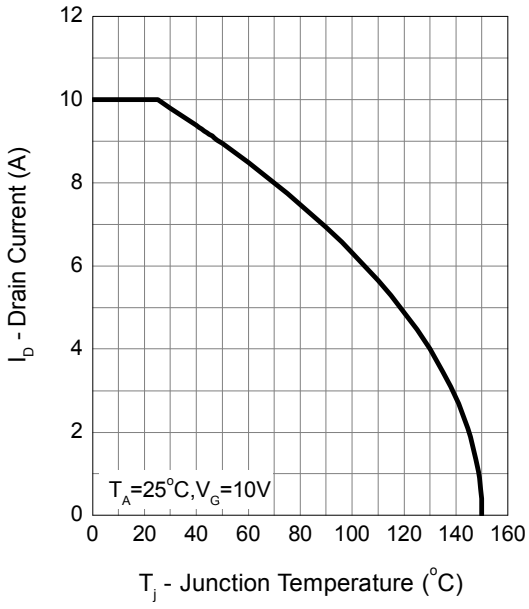
Note e：Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

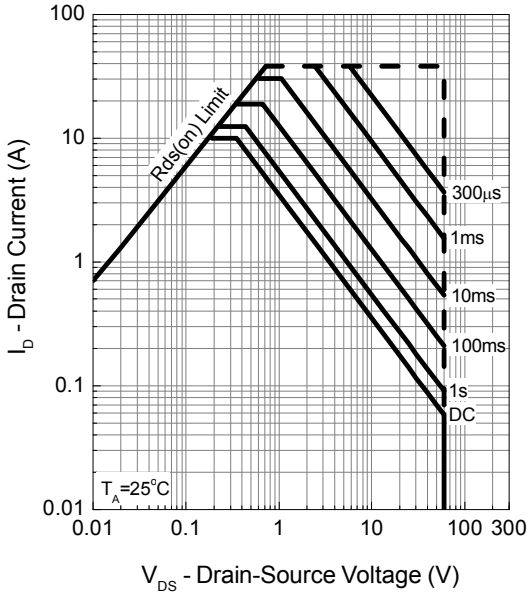
Power Dissipation



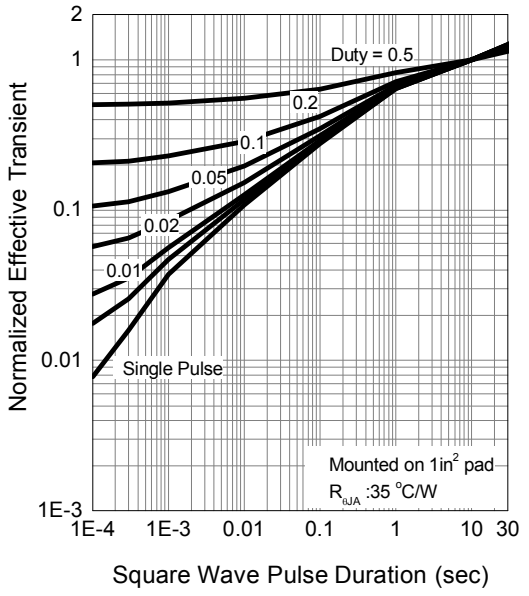
Drain Current



Safe Operation Area

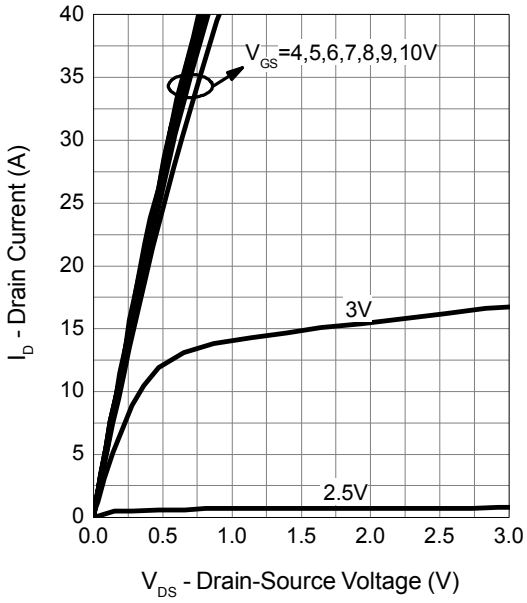


Thermal Transient Impedance

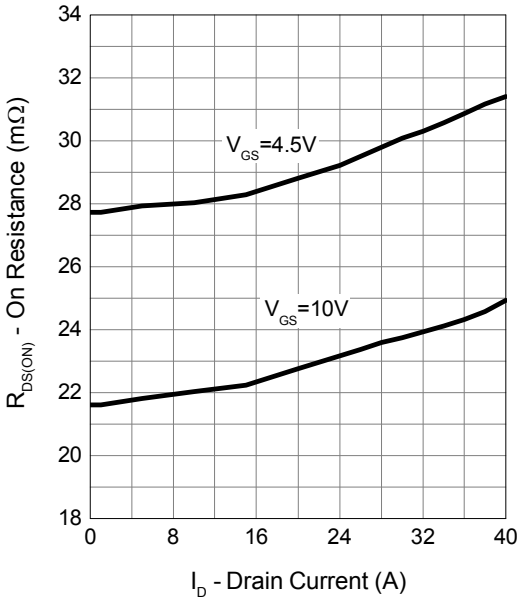


Typical Operating Characteristics (Cont.)

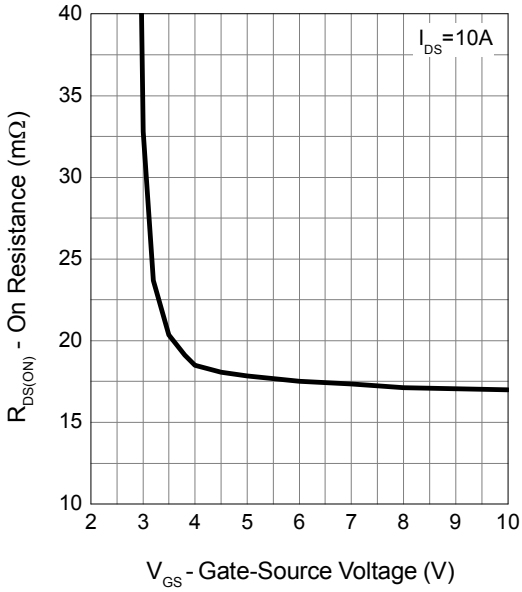
Output Characteristics



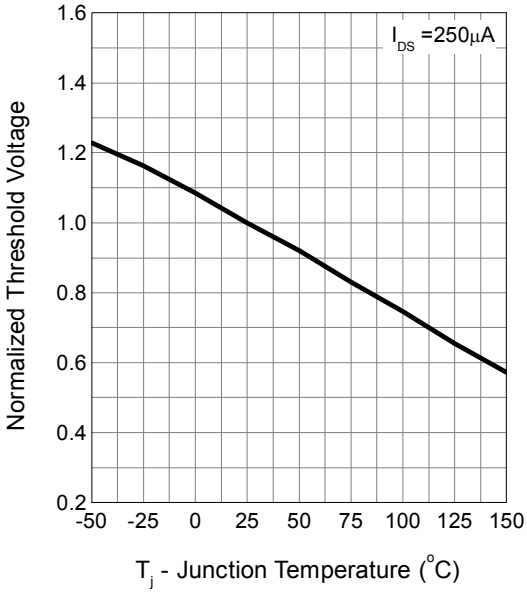
Drain-Source On Resistance



Gate-Source On Resistance

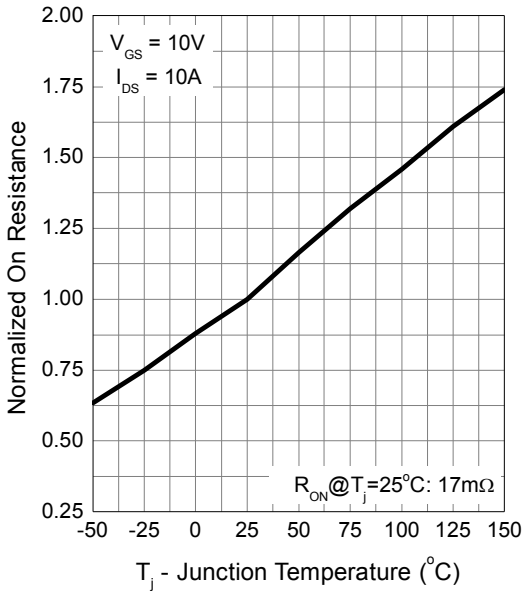


Gate Threshold Voltage

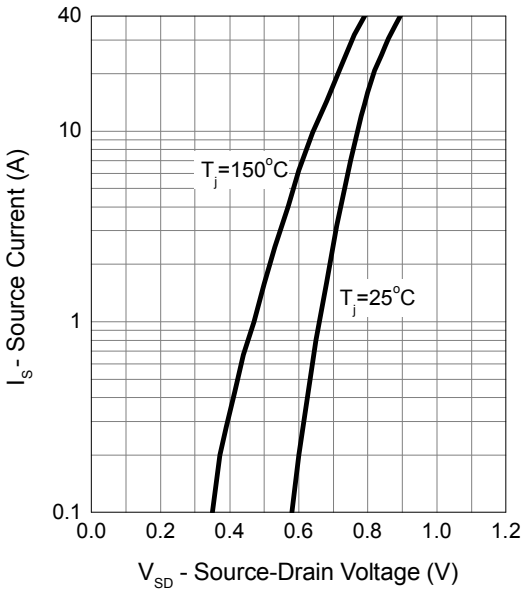


Typical Operating Characteristics (Cont.)

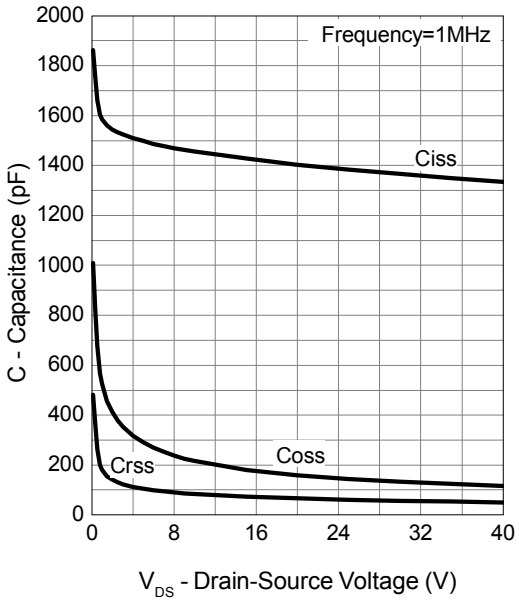
Drain-Source On Resistance



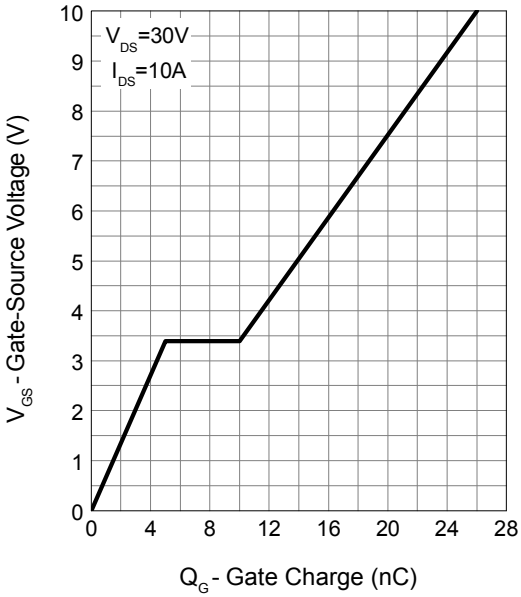
Source-Drain Diode Forward



Capacitance



Gate Charge



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