

General Description

The WSP6044 is the highest performance trench N-ch MOSFETs with extreme high cell density , which provide excellent $R_{DS(on)}$ 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

BV_{DSS}	$R_{DS(on)}$	I_D
60V	18m Ω	10A

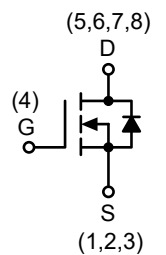
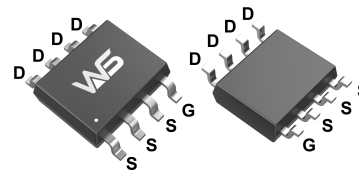
Applications

SMPS Synchronous Rectification.

DC-DC Conversion.

Load Switch.

SOP-8L 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	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	
I_S	Diode Continuous Forward Current	$T_A=25^{\circ}\text{C}$	5	A
I_D	Continuous Drain Current	$T_A=25^{\circ}\text{C}$	10	
		$T_A=70^{\circ}\text{C}$	8	
I_{DM}^a	Pulsed Drain Current	$T_A=25^{\circ}\text{C}$	38	
P_D	Maximum Power Dissipation	$T_A=25^{\circ}\text{C}$	3.5	W
		$T_A=70^{\circ}\text{C}$	2.2	
RJA^c	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	35	$^{\circ}\text{C/W}$
		Steady-State	70	
I_{AS}^b	Avalanche Current, Single pulse	$L=0.1\text{mH}$	27	A
E_{AS}^b	Avalanche Energy, Single pulse	$L=0.1\text{mH}$	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 $T_J=25^{\circ}\text{C}$).

Note c: Surface Mounted on 1in2 pad area.

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

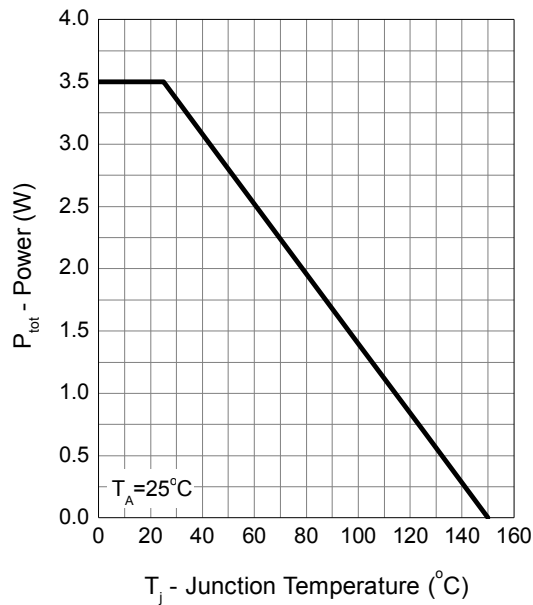
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250 A	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =48V, V _{GS} =0V	-	-	1	uA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 A	1.4	-	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	-	8	15	ns
t _r	Turn-on Rise Time		-	14	26	
t _{d(OFF)}	Turn-off Delay Time		-	12	22	
t _f	Turn-off Fall Time		-	38	69	
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%.

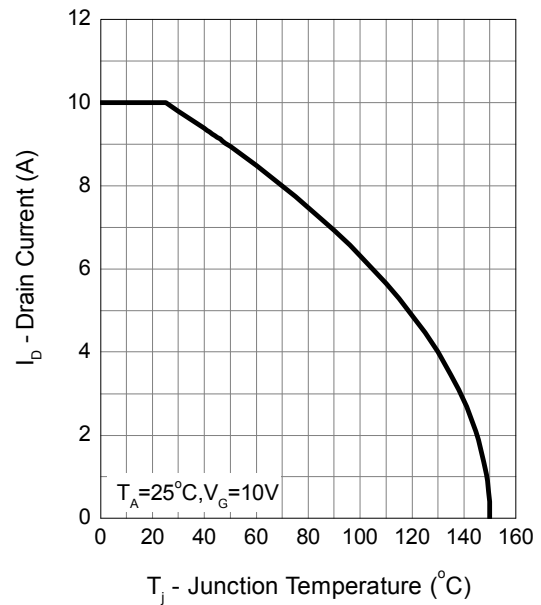
Note e : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

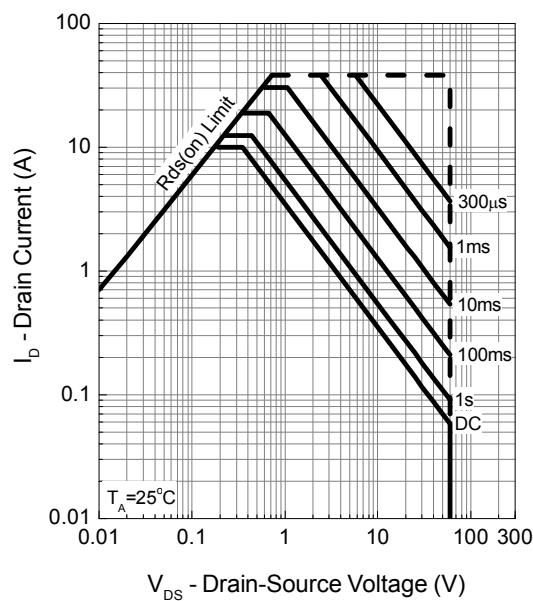
Power Dissipation



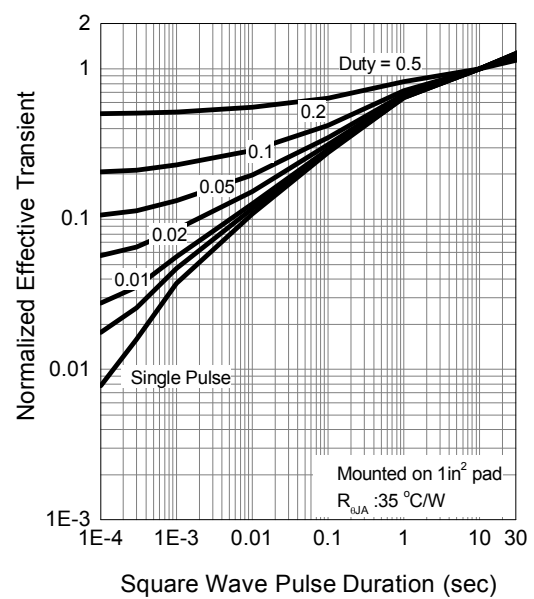
Drain Current



Safe Operation Area

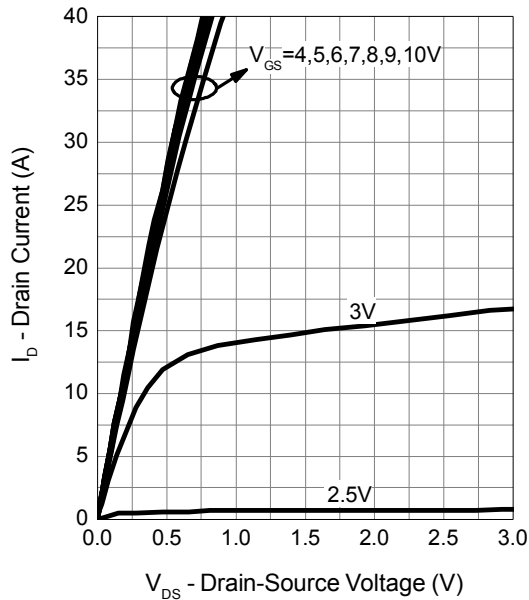


Thermal Transient Impedance

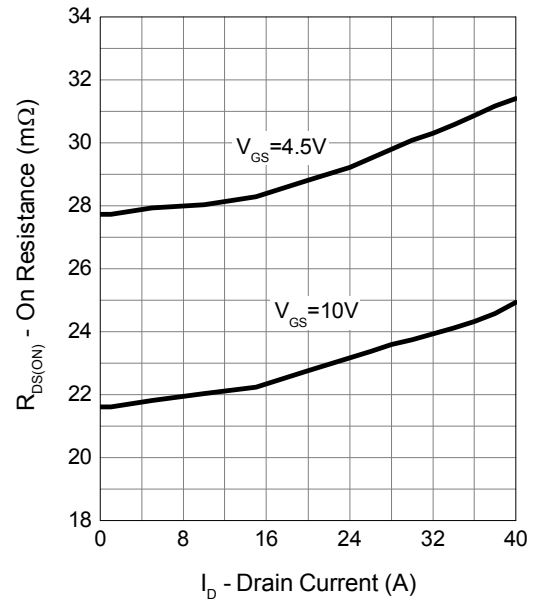


Typical Operating Characteristics (Cont.)

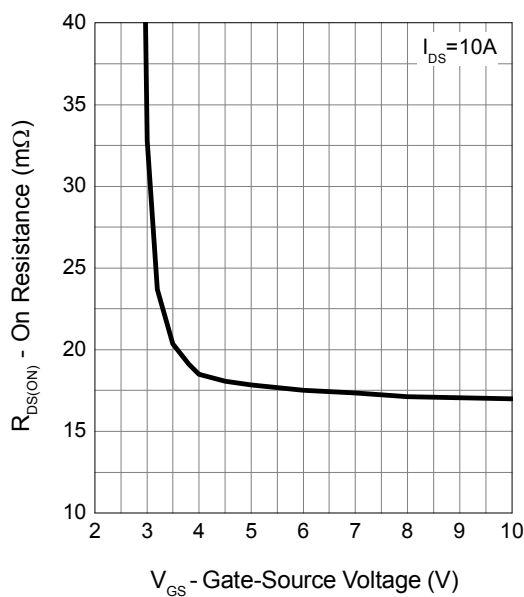
Output Characteristics



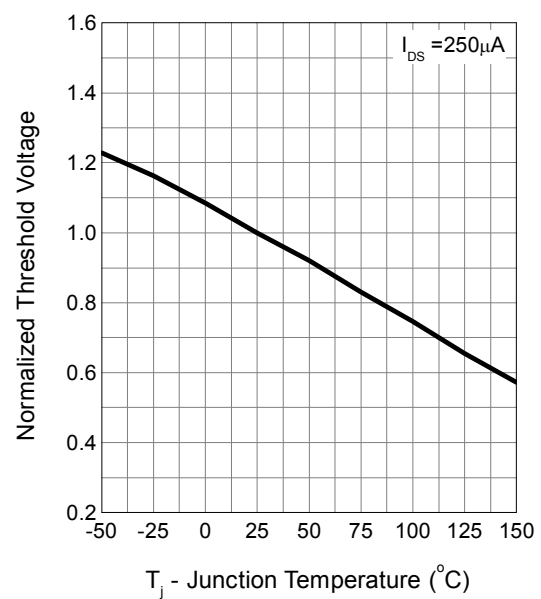
Drain-Source On Resistance



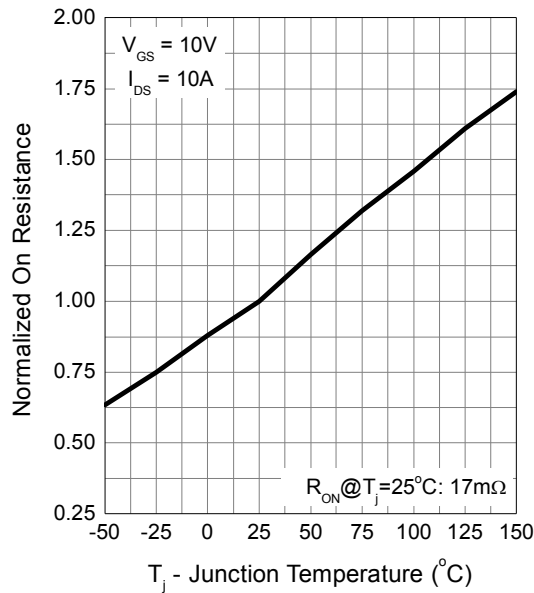
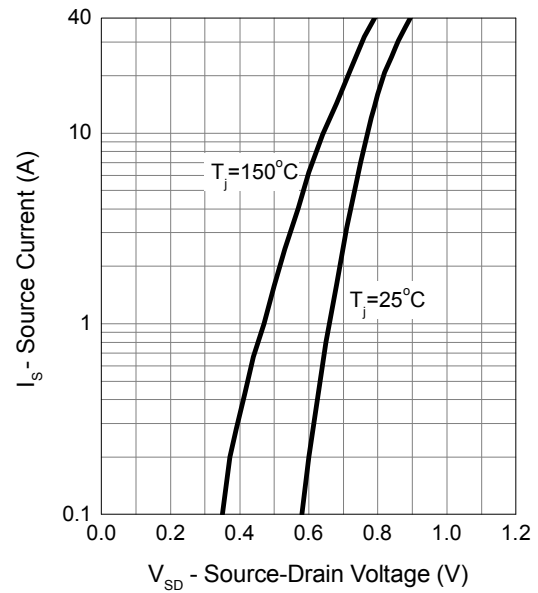
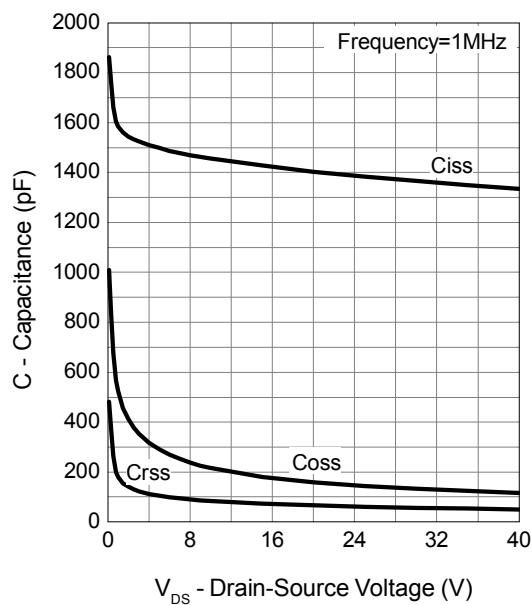
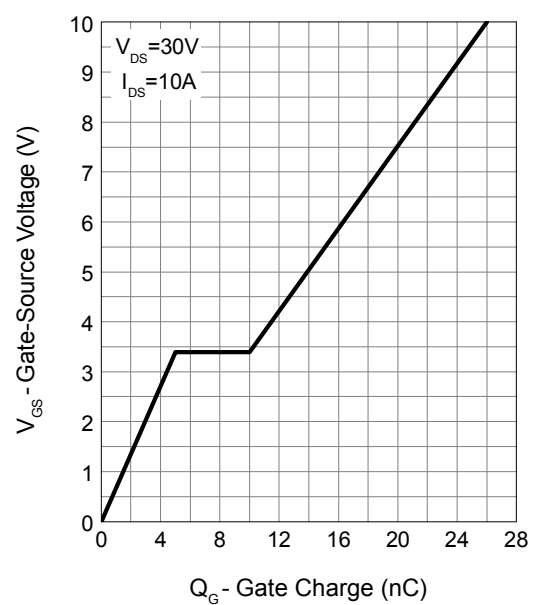
Gate-Source On Resistance



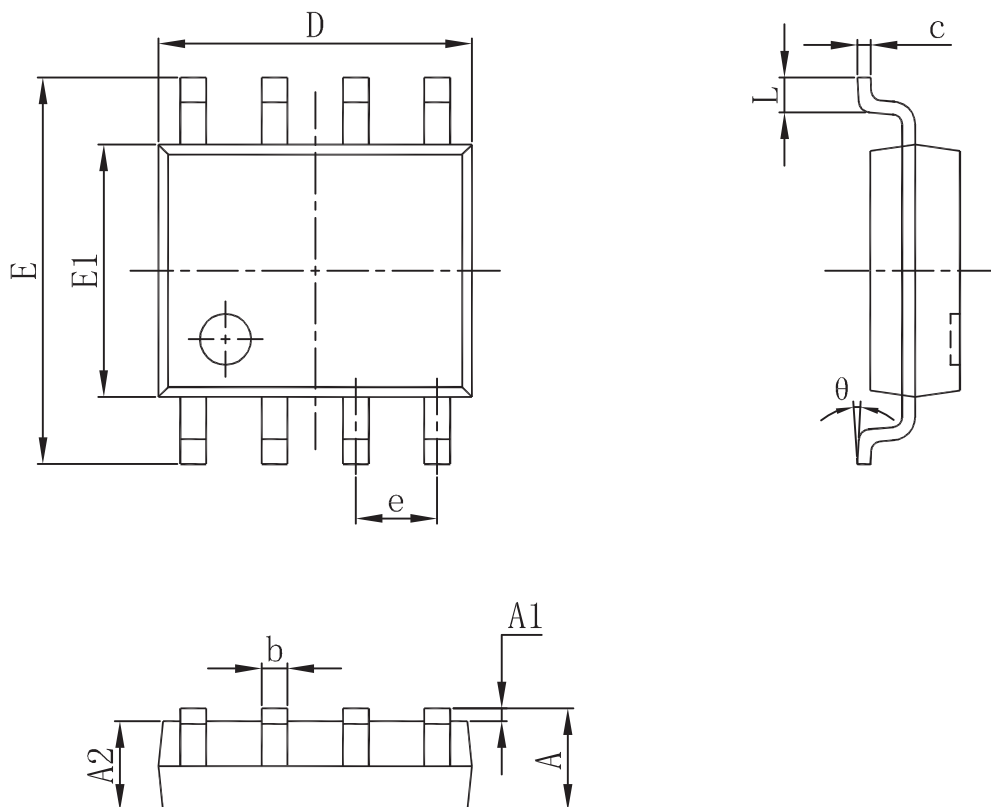
Gate Threshold Voltage



Typical Operating Characteristics (Cont.)

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


Packaging information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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