

General Description

The WSP6024 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 .

The WSP6024 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

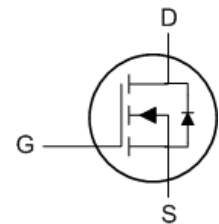
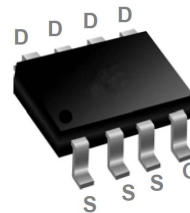
Product Summary

BVDSS	RDSON	ID
60V	8mΩ	15A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

SOP-8 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V ¹	15	A
I _D @T _C =70°C	Continuous Drain Current, V _{GS} @ 10V ¹	9.6	A
I _{DM} ^a	Pulsed Drain Current ²	43	A
EAS ^b	Single Pulse Avalanche Energy ³	81	mJ
I _{AS} ^b	Avalanche Current	16	A
P _D @T _A =25°C	Total Power Dissipation ⁴	1.78	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA} ^c	Thermal Resistance Junction-ambient ¹	---	72	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	1.2	°C/W

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_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	60	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.044	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =13A	---	8	10	mΩ
		V _{GS} =4.5V, I _D =8A	---	11	13.7	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	2.0	3.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4.6	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =60V, V _{GS} =0V, T _J =55°C	---	---	100	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Q _g	Total Gate Charge (10V)	V _{DS} =30V, V _{GS} =10V, I _D =6A	---	25.4	---	nC
Q _{gs}	Gate-Source Charge		---	4.6	---	
Q _{gd}	Gate-Drain Charge		---	3.8	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =30V, V _{GEN} =10V, R _G =6Ω, I _D =1A, R _L =30Ω	---	15	---	ns
T _r	Rise Time		---	7	---	
T _{d(off)}	Turn-Off Delay Time		---	34	---	
T _f	Fall Time		---	30	---	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	---	1500	---	pF
C _{oss}	Output Capacitance		---	280	---	
C _{rss}	Reverse Transfer Capacitance		---	40	---	

Diode Characteristics

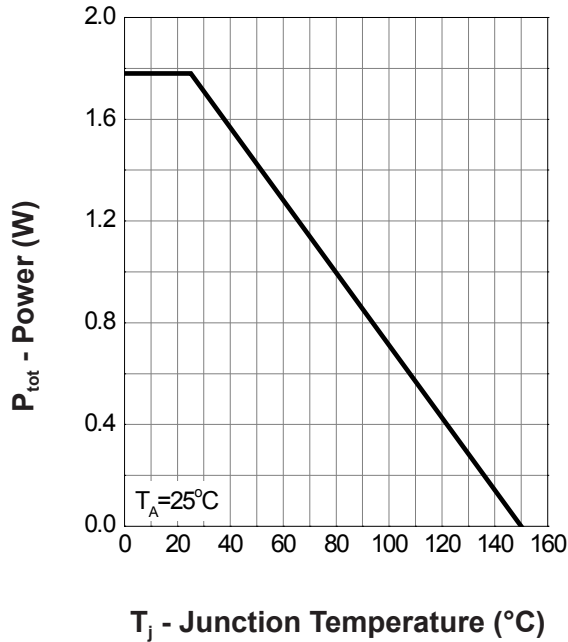
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.3	V
t _{rr}	Reverse Recovery Time	I _F =6.0A, dI/dt=100A/μs, T _J =25°C	---	30	---	nS
Q _{rr}	Reverse Recovery Charge		---	29	---	nC

Note d : Pulse test ; pulse width≤300ms, duty cycle≤2%.

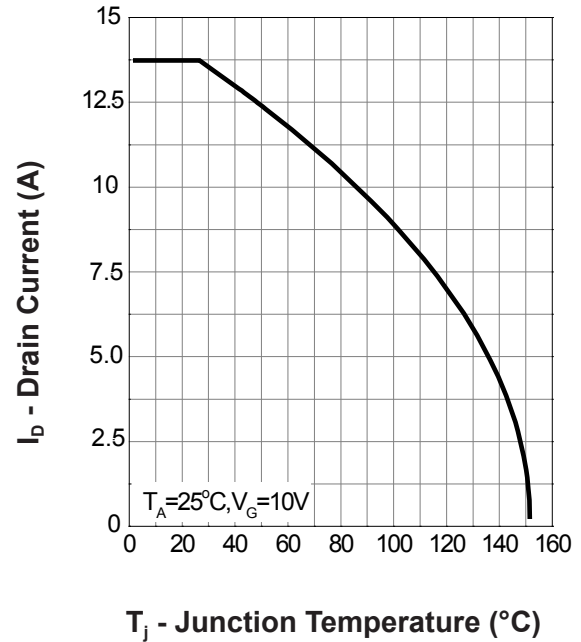
Note e : Guaranteed by design, not subject to production testing.

Typical Characteristics

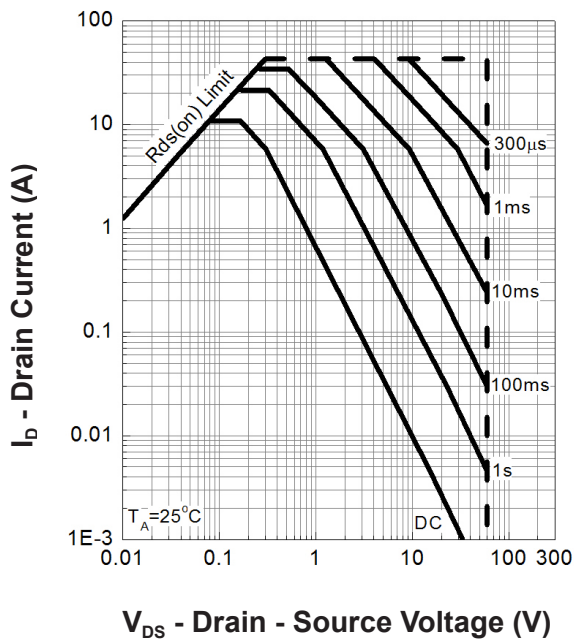
Power Dissipation



Drain Current



Safe Operation Area



Thermal Transient Impedance

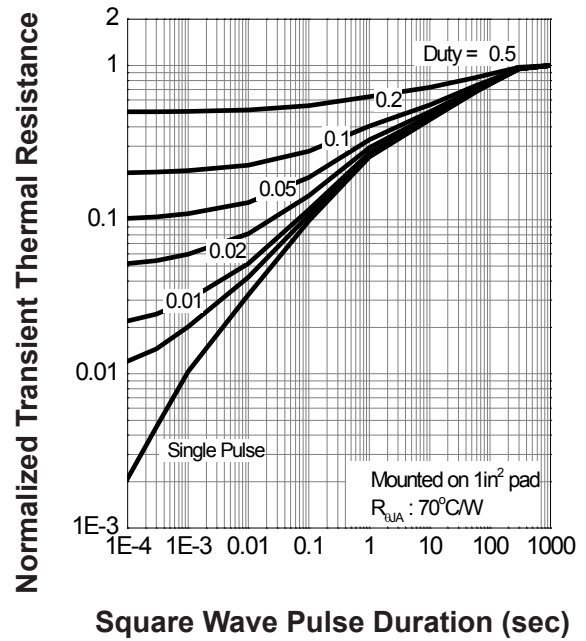
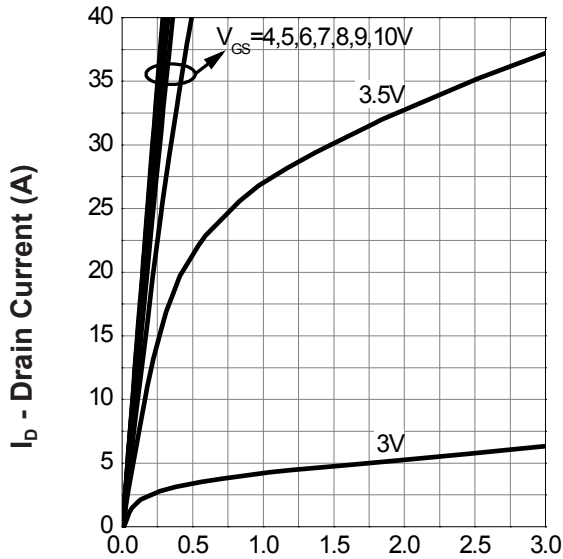


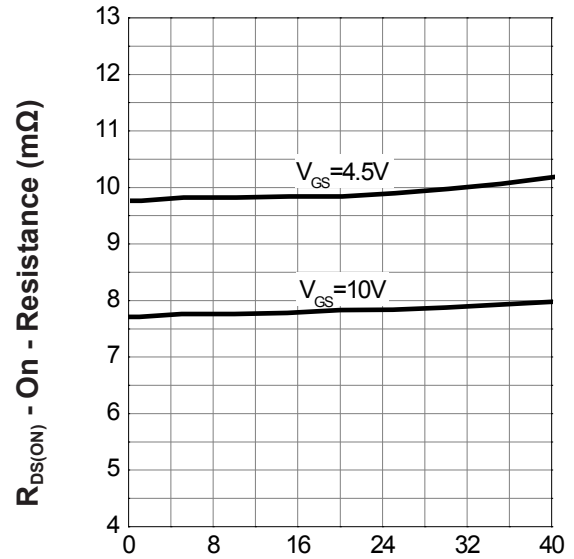
Fig5. Typical Source-Drain Diode Forward Voltage

Output Characteristics



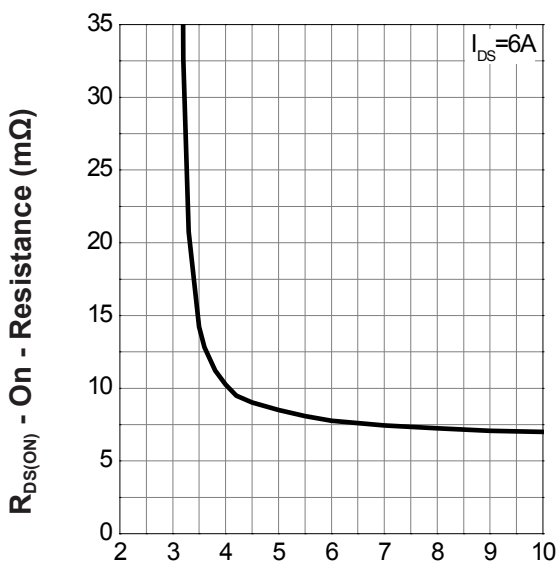
V_{DS} - Drain - Source Voltage (V)

Drain-Source On Resistance



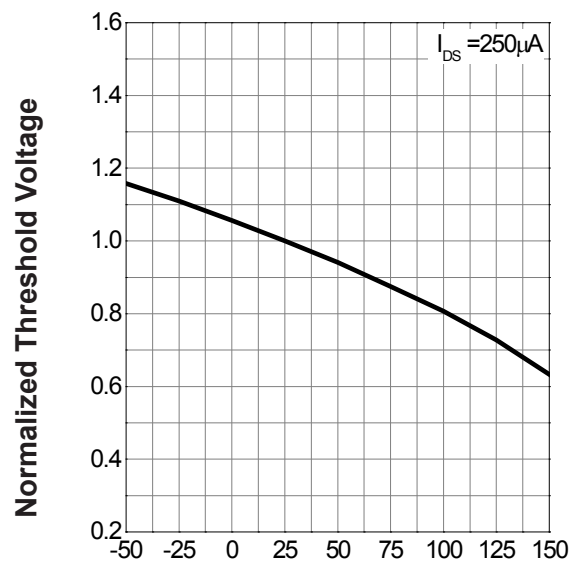
I_D - Drain Current (A)

Gate-Source On Resistance



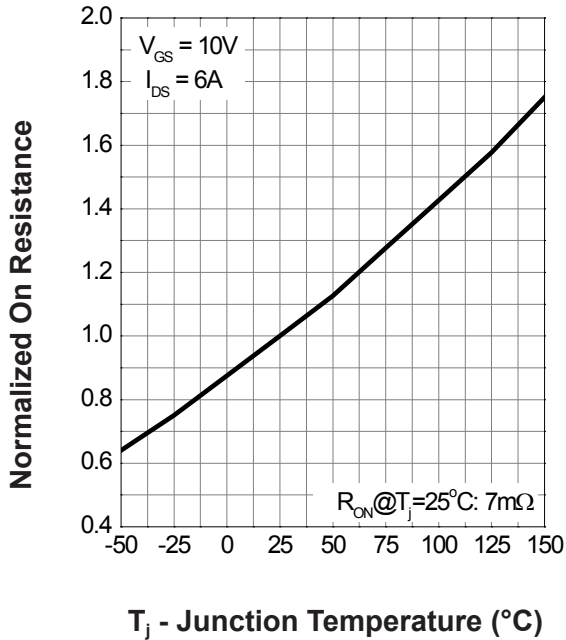
V_{GS} - Gate - Source Voltage (V)

Gate Threshold Voltage

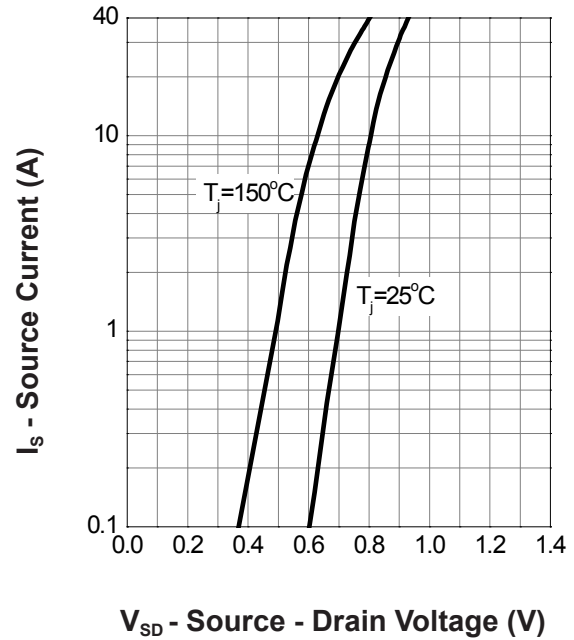


T_j - Junction Temperature ($^{\circ}C$)

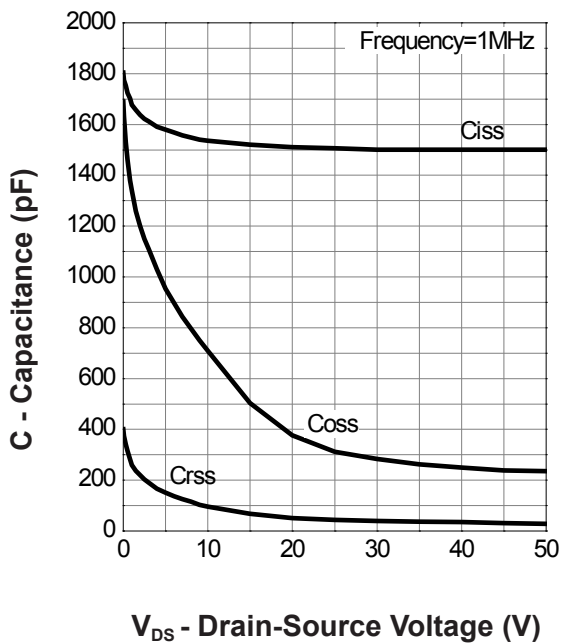
Drain-Source On Resistance



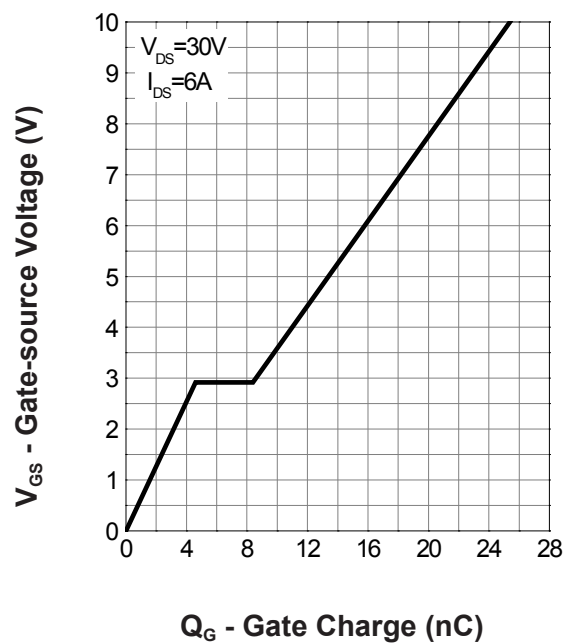
Source-Drain Diode Forward



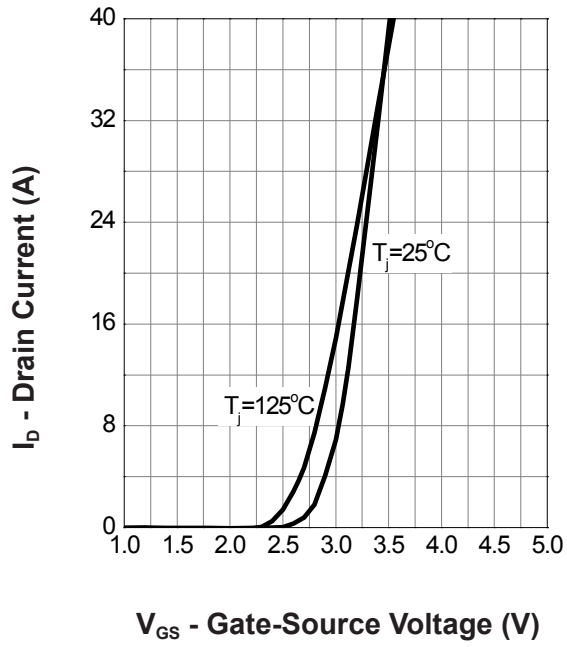
Capacitance



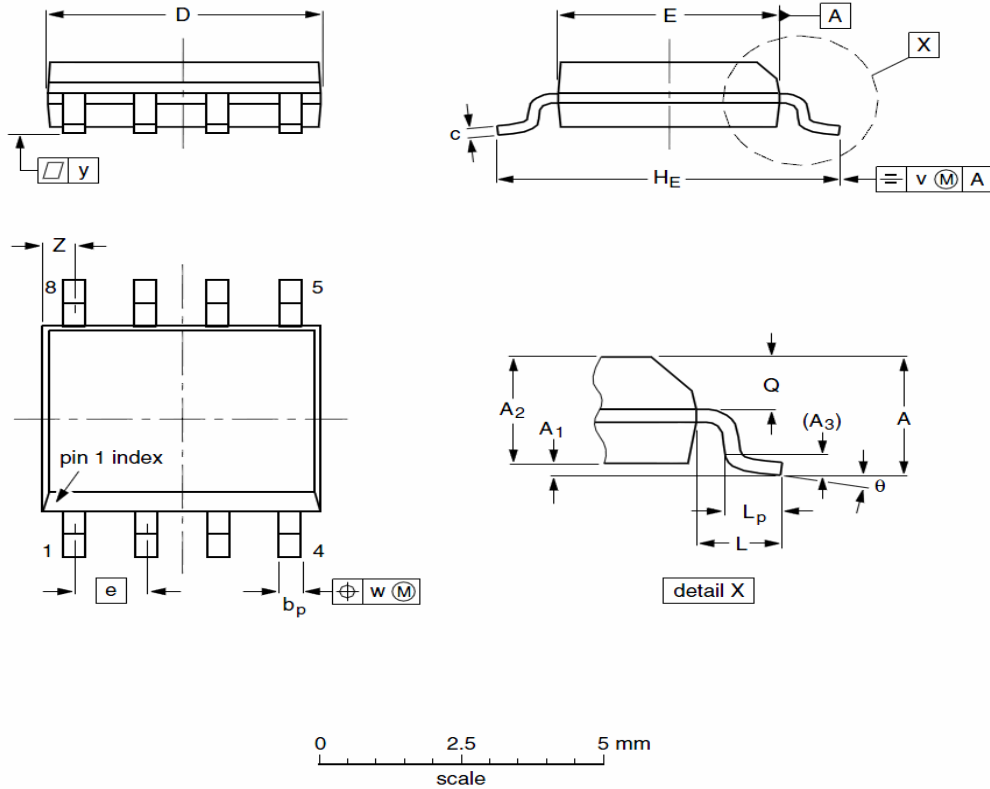
Gate Charge



Transfer Characteristics



SOP8 Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	--	1.75	--	A ₁	0.10	0.18	0.25
A ₂	1.25	1.35	1.45	A ₃	--	0.25	--
b _p	0.36	0.42	0.49	c	0.19	0.22	0.25
D	4.80	4.92	5.00	E	3.80	3.90	4.00
e	--	1.27	--	H _E	5.80	5.98	6.20
L	--	1.05	--	L _p	0.40	0.68	1.00
Q	0.60	0.65	0.70	v	--	0.25	--
w	--	0.25	--	y	--	0.10	--
Z	0.30	0.50	0.70	θ	0°		8°



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