

General Description

The WSK160N15 is the highest performance trench N-ch MOSFET with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The WSK160N15 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

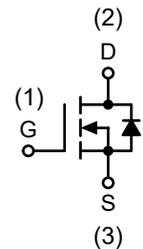
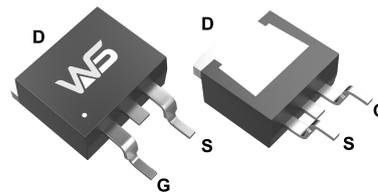
Product Summary

BVDSS	RDSON	ID
150V	6.6mΩ	160A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter
- Networking DC-DC Power System

TO-263-2L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current, $V_{GS} @ 10V(T_C=25^\circ C)$	160	A
I_{DM}	Pulsed Drain Current	550	A
EAS	Single Pulse Avalanche Energy	506	mJ
P_D	Total Power Dissipation... $c=25^\circ C$	210	W
$R_{\theta JA}$	Thermal resistance, junction-ambient	62	$^\circ C/W$
$R_{\theta JC}$	Thermal resistance, junction-case	0.84	$^\circ C/W$
T_{STG}	Storage Temperature Range	-55 to 155	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 155	$^\circ C$

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	150	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =30A	---	6.6	7.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.0	2.9	4.0	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =100V, V _{GS} =0V, T _J =25°C	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Q _g	Total Gate Charge	V _{DS} =50V, V _{GS} =10V, I _D =20A	---	72	---	nC
Q _{gs}	Gate-Source Charge		---	18	---	
Q _{gd}	Gate-Drain Charge		---	10	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =50V, V _{GS} =10V R _G =3Ω, I _D =20A	---	22	---	ns
T _r	Rise Time		---	115	---	
T _{d(off)}	Turn-Off Delay Time		---	44	---	
T _f	Fall Time		---	105	---	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	5240	---	pF
C _{oss}	Output Capacitance		---	412	---	
C _{riss}	Reverse Transfer Capacitance		---	30	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	150	A
I _{SM}	Pulsed Source Current ²		---	---	500	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =20A, T _J =25°C	---	---	1.3	V

■ Note

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) Pd is based on max. junction temperature, using junction-case thermal resistance.
- 3) The value of RθJA is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.
- 4) V_{DD}=50 V, R_G=50 Ω, L=0.5 mH, starting T_J=25 °C.
- 5) Calculated continuous current based on maximum allowable junction temperature.

Typical Characteristics

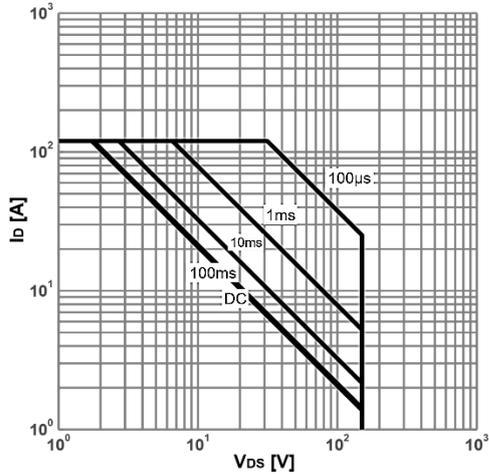


Figure 1. Power dissipation

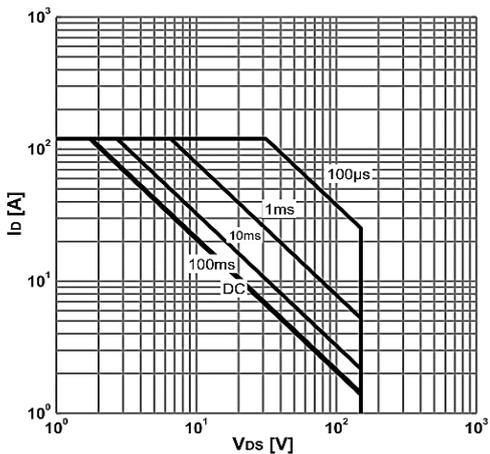


Figure 3. Safe operating area

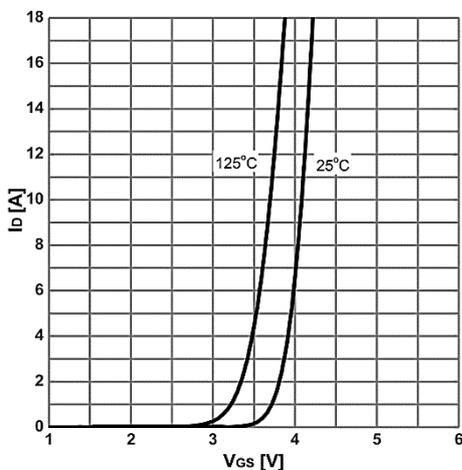


Figure 5. Typ. transfer characteristics

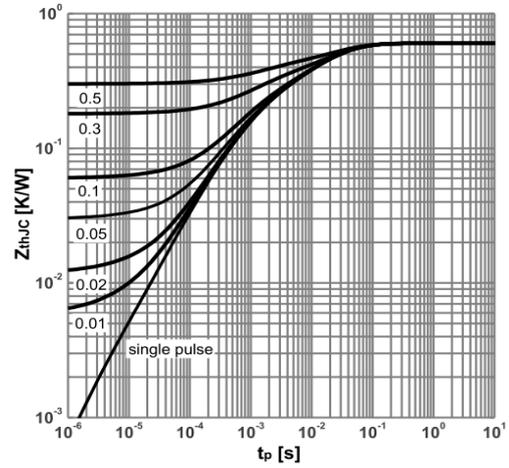


Figure 2. Max. transient thermal impedance

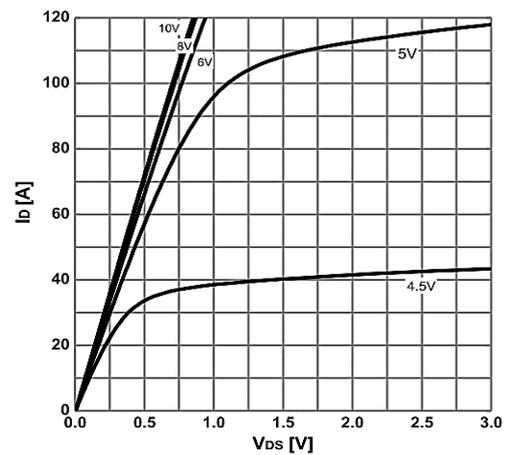


Figure 4. Typ. output characteristics

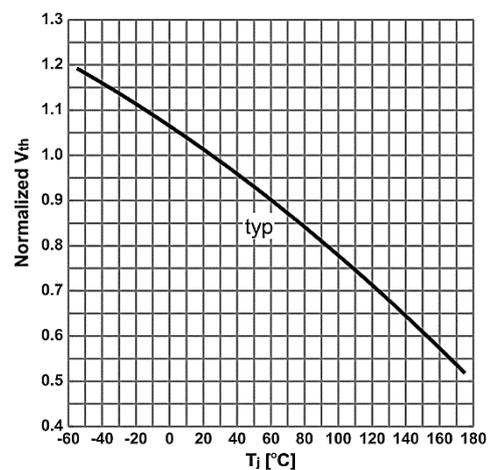


Figure 6. Gate threshold voltage vs. Junction Temperature

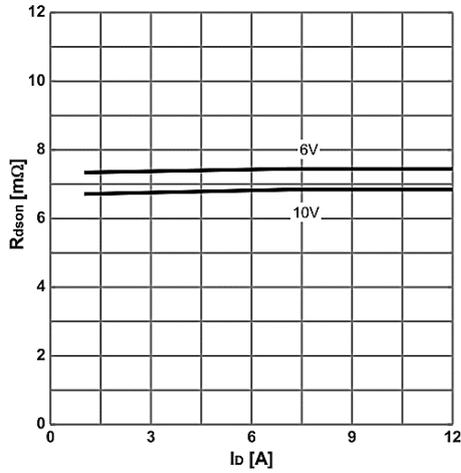


Figure 7. On-state resistance vs. Drain current

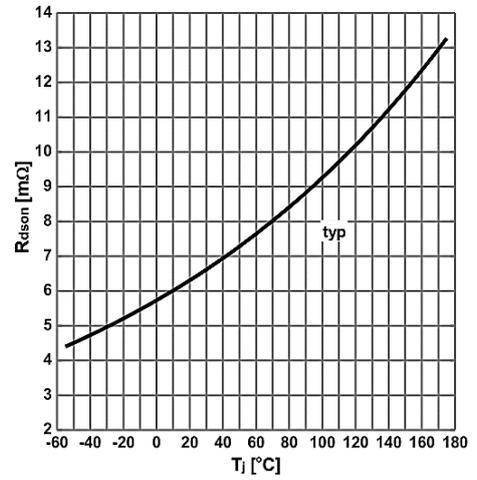


Figure 8. On-state resistance vs. Junction temperature

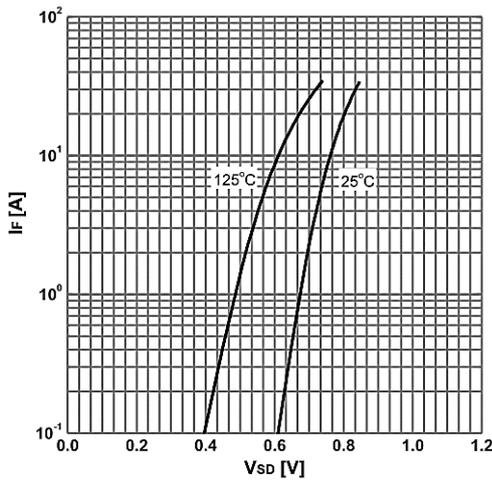


Figure 9. Forward characteristics of reverse diode

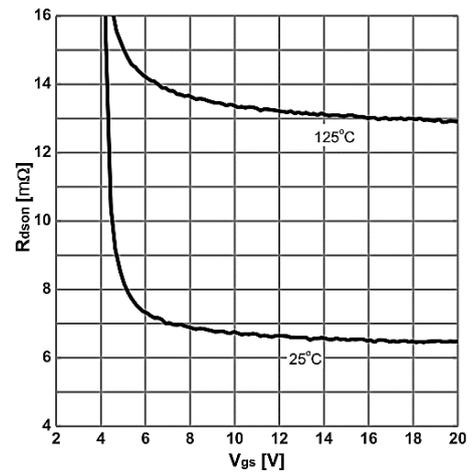


Figure 10. On-state resistance vs. Vgs characteristics

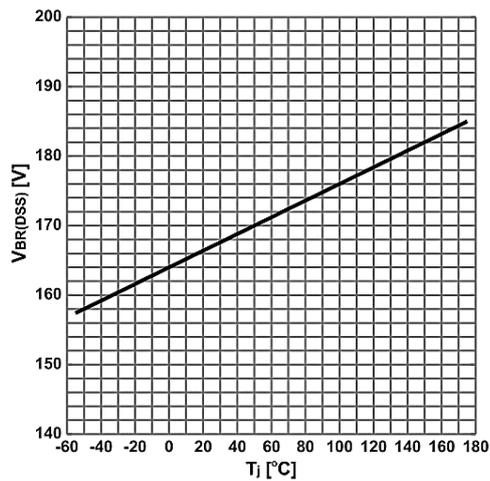


Figure 10: Breakdown Voltage Variation vs. Temperature

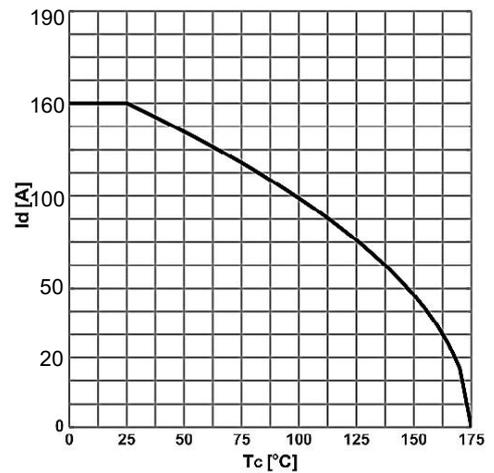
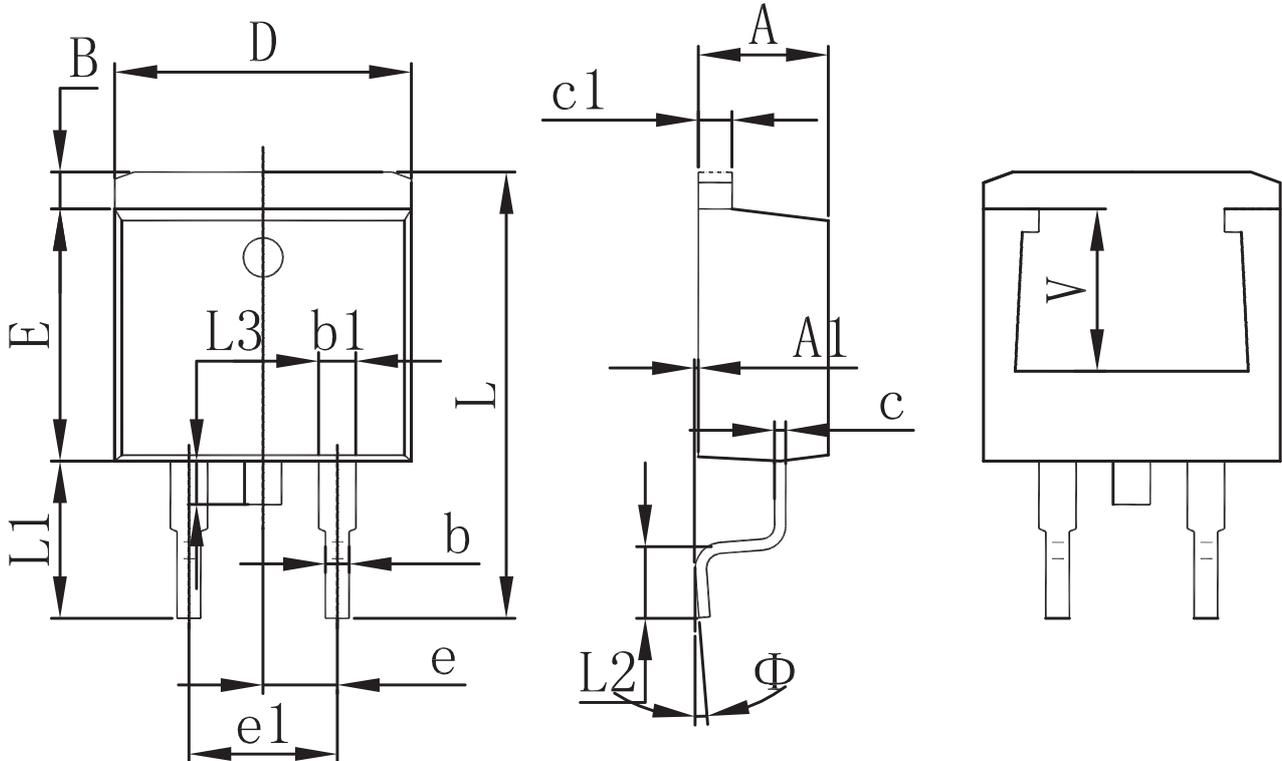


Figure 11: Maximum Drain Current

Packaging information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220REF.	



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