

650V N-Channel Super-Junction MOSFET

Features

- Much lower On-resistance RDS(ON)
- LowCrss
- Fast switching
- Improved dv/dt capability
- Electrostatic Discharge (ESD)

Applications

- LED/LCD/PDP TV and monitor Lighting
- Solar/Renewable/UPS-Micro Inverter System
- Charger
- Power Supply



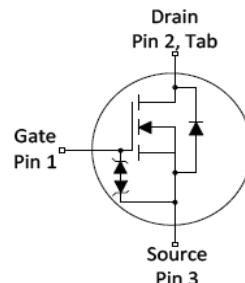
Product Summary

VDS	650	V
RDS(on),Typ.@VGS=10V	341	mΩ
ID	11	A

100% UIS TESTED!
100% ΔVds TESTED!



TO-263



Schematic Diagram

Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{DSS}	Drain-Source Voltage	650	V
I _D	Drain Current - Continuous (T _C = 25°C)	11	A
	- Continuous (T _C = 100°C)	7.9	A
I _{DM}	Drain Current - Pulsed (Note 1)	44	A
V _{GSS}	Gate-Source Voltage	±30	V
E _{AS}	Single Pulsed Avalanche Energy	300	mJ
P _D	Power Dissipation (T _C = 25°C)	118	W
R _{θJC}	Thermal Resistance, Junction to Case	1.06	W/°C
T _J , T _{TSG}	Operating and Storage Temperature Range	-55 to +150	°C
T _L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	°C

* Drain current limited by maximum junction temperature.

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Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 uA	650	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 650 V, V _{GS} = 0 V	--	--	1	uA
		V _{DS} = 520V, T _C = 125°C	--	--	10	uA
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} = 30V, V _{DS} = 0 V	--	--	1	uA
I _{GSRR}	Gate-Body Leakage Current, Reverse	V _{GS} = -30 V, V _{DS} = 0 V	--	--	-1	uA

On Characteristics

V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 uA	2.0	3.0	4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 3.4A	--	341	360	mΩ

Dynamic Characteristics

C _{iss}	Input Capacitance	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz	--	780	-	pF
C _{oss}	Output Capacitance		--	597	-	pF
C _{rss}	Reverse Transfer Capacitance		--	17.4	-	pF

Switching Characteristics

t _{d(on)}	Turn-On Delay Time	V _{GS} = 10 V, V _{DS} = 400 V, R _G = 25Ω, I _D = 4A	--	16	--	ns
t _r	Turn-On Rise Time		--	35	--	ns
t _{d(off)}	Turn-Off Delay Time		--	75	--	ns
t _f	Turn-Off Fall Time		--	38	--	ns
Q _g	Total Gate Charge	V _{DS} = 400 V, I _D = 4A, V _{GS} = 10V	--	18.9	--	nC
Q _{gs}	Gate-Source Charge		--	2.54	--	nC
Q _{gd}	Gate-Drain Charge		--	6.09	--	nC

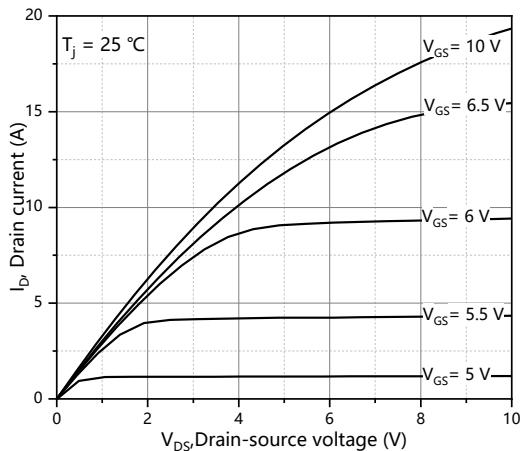
Drain-Source Diode Characteristics and Maximum Ratings

I _S	Maximum Continuous Drain-Source Diode Forward Current	--	--	11	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	44	A
V _{SD}	Drain to Source Diode Forward Voltage, V _{GS} = 0V, I _{SD} = 3A, T _J = 25°C	0.32	0.8	1.2	V
t _{rr}	Body Diode Reverse Recovery Time, I _F = 3.4A, dI/dt = 100A/μs	--	208	--	nS
Q _{rr}	Body Diode Reverse Recovery Charge, I _F = 3.4A, dI/dt = 100A/μs	--	2.9	--	nC

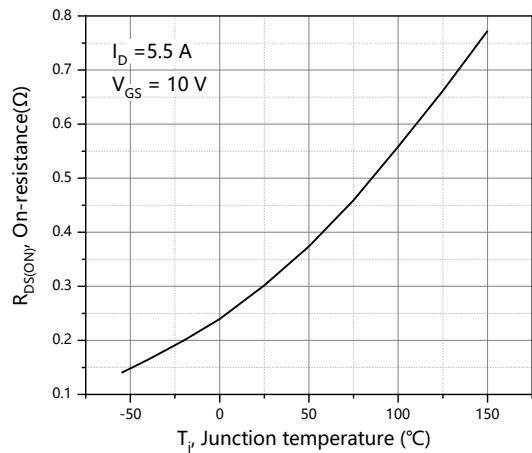
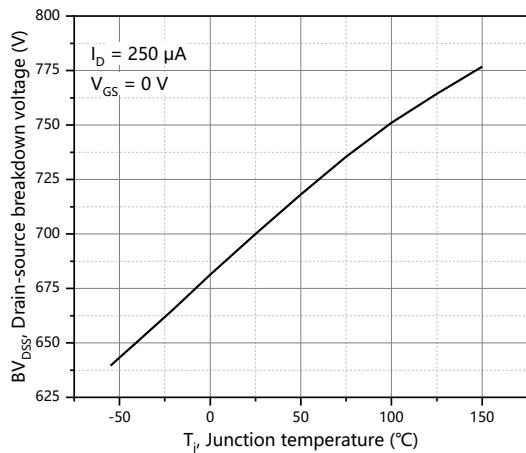
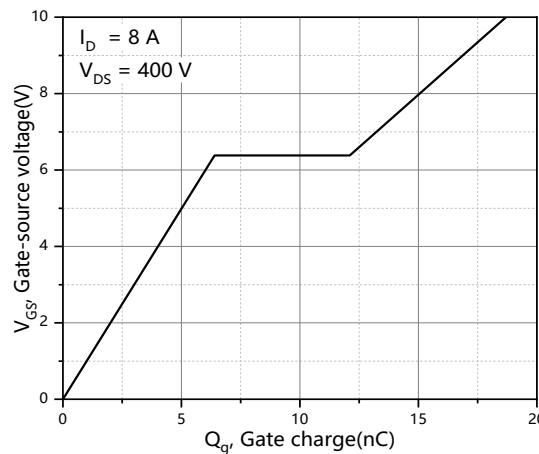
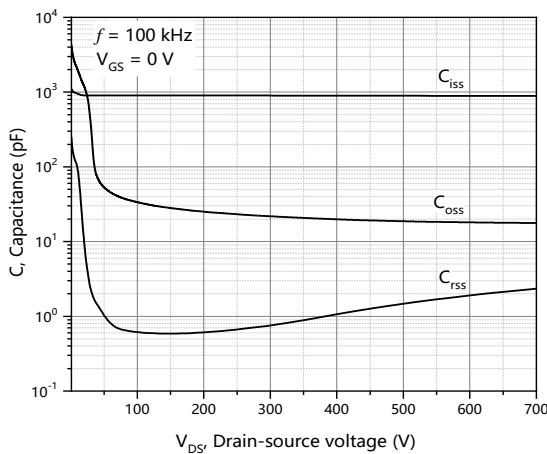
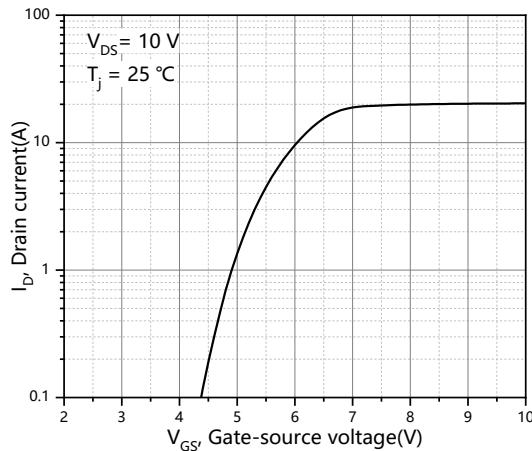
Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J = 25°C, V_{DD} = 50V, V_G = 10V, R_G = 25Ω, L = 0.5mH,
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%

Electrical Characteristics Diagrams



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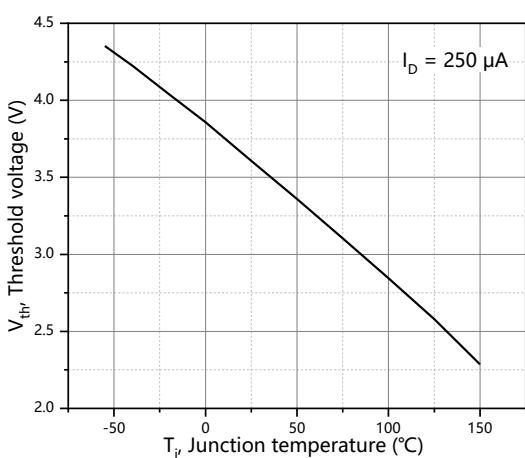


Figure 7. Threshold voltage

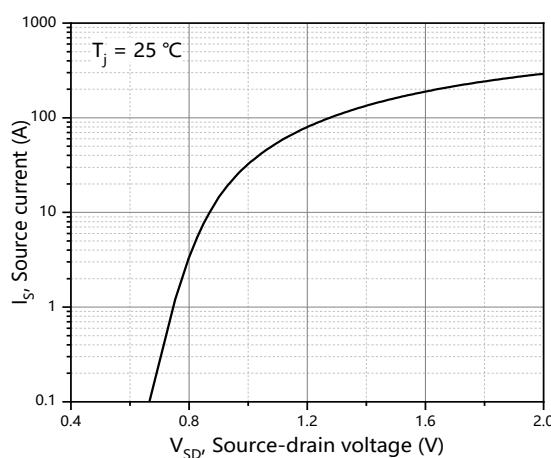


Figure 8. Forward characteristic of body diode

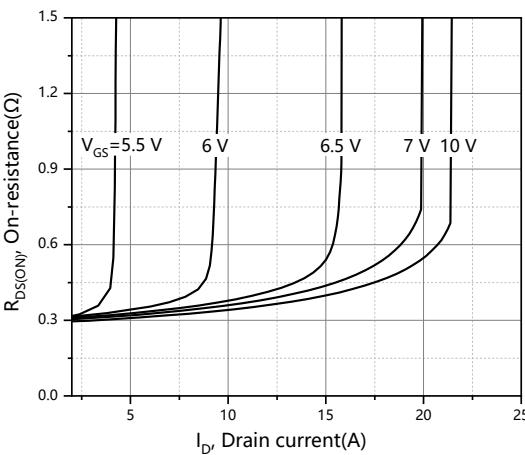


Figure 9. Drain-source on-state resistance

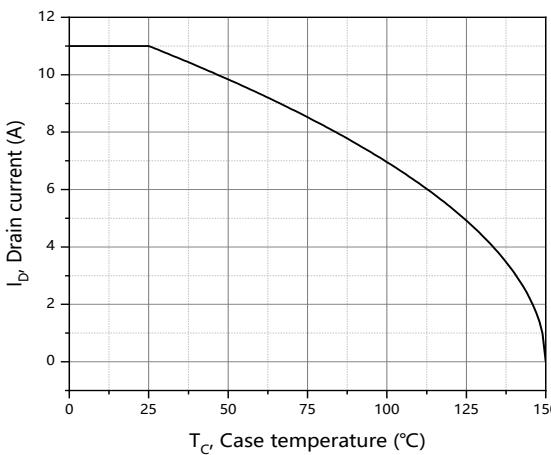


Figure 10. Drain current

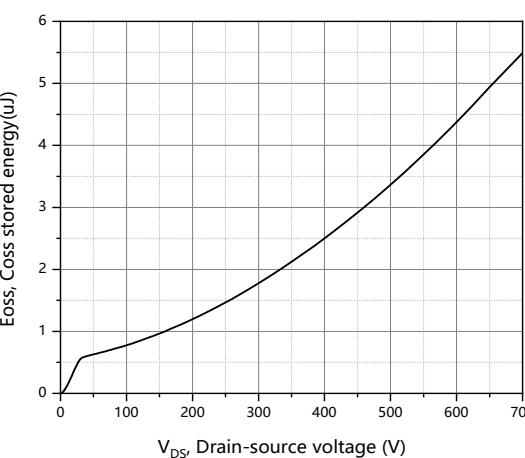


Figure 11. Typ. Coss stored energy

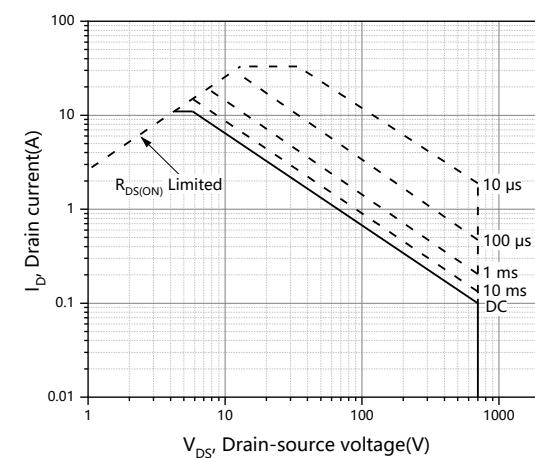


Figure 12. Safe operation area $T_c=25 ^\circ C$

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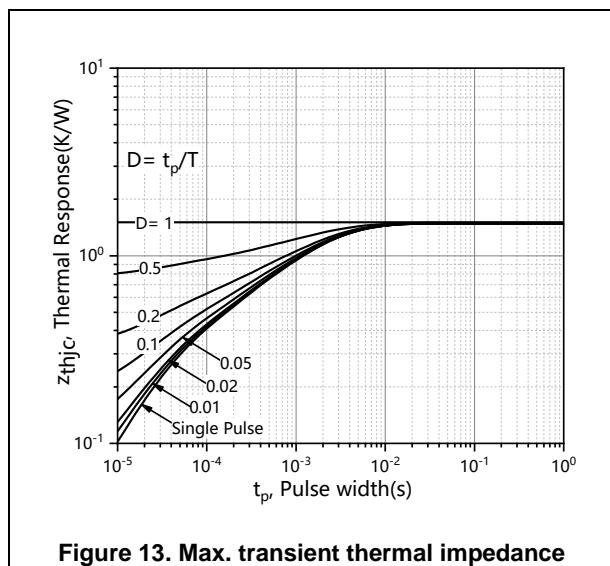


Figure 13. Max. transient thermal impedance

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Test circuits and waveforms

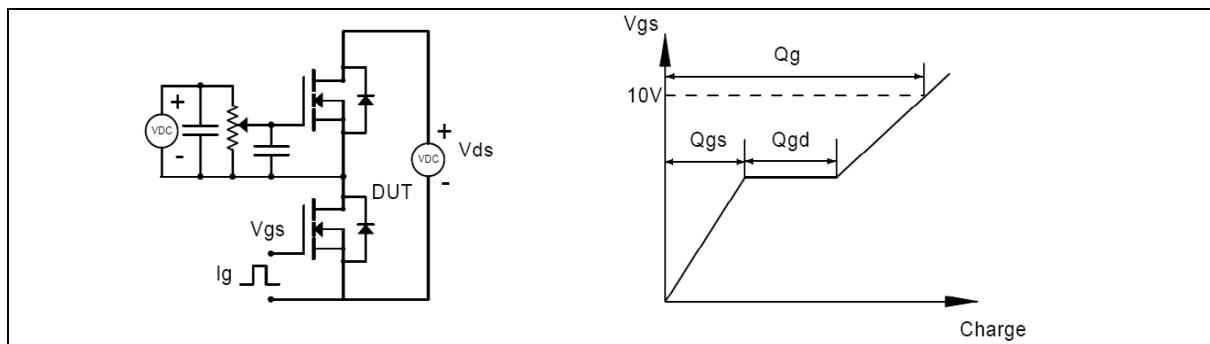


Figure 1. Gate charge test circuit & waveform

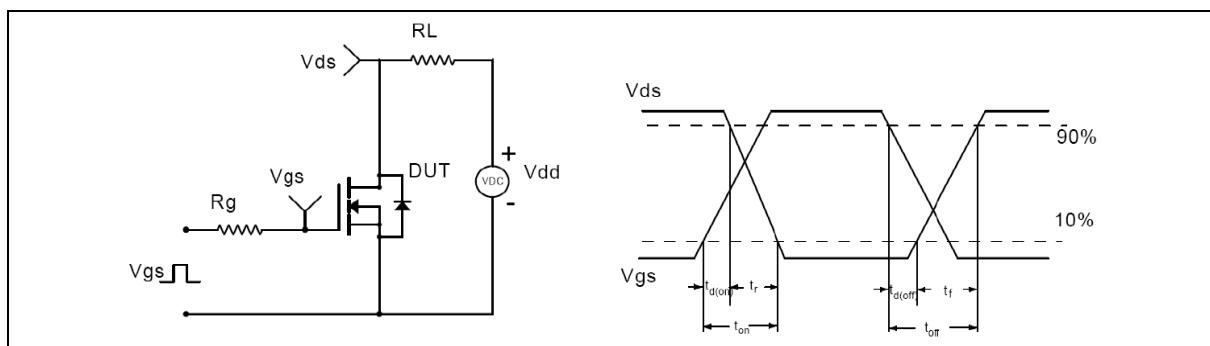


Figure 2. Switching time test circuit & waveforms

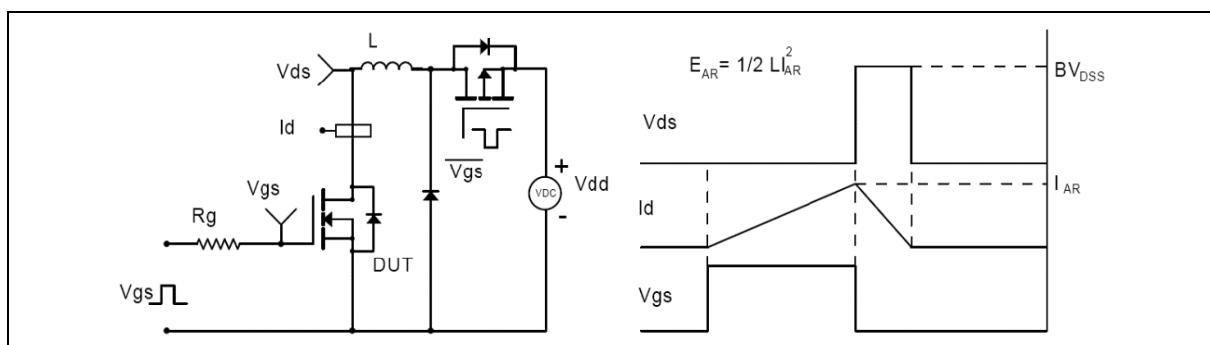


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

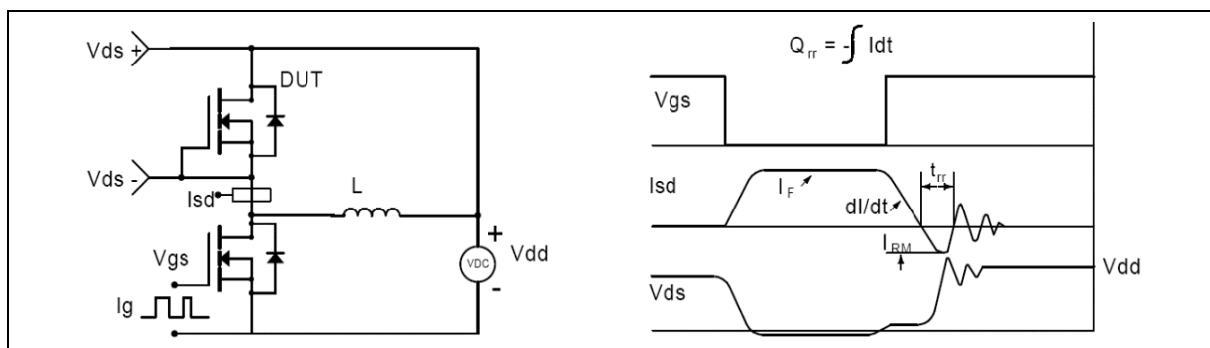
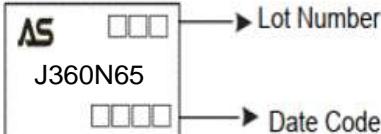


Figure 4. Diode reverse recovery test circuit & waveforms

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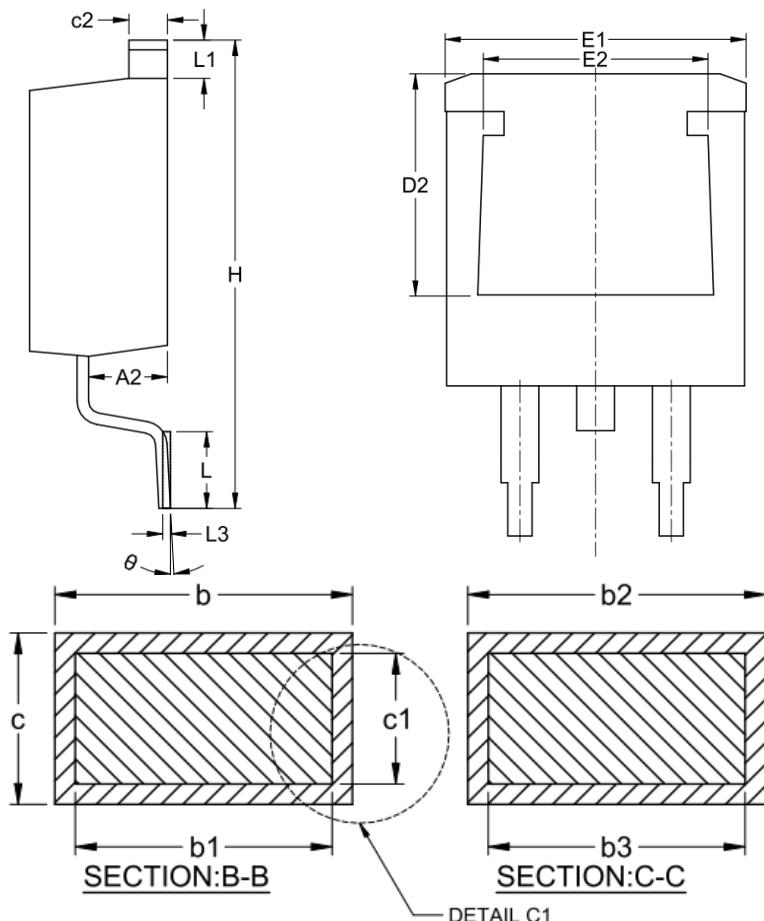
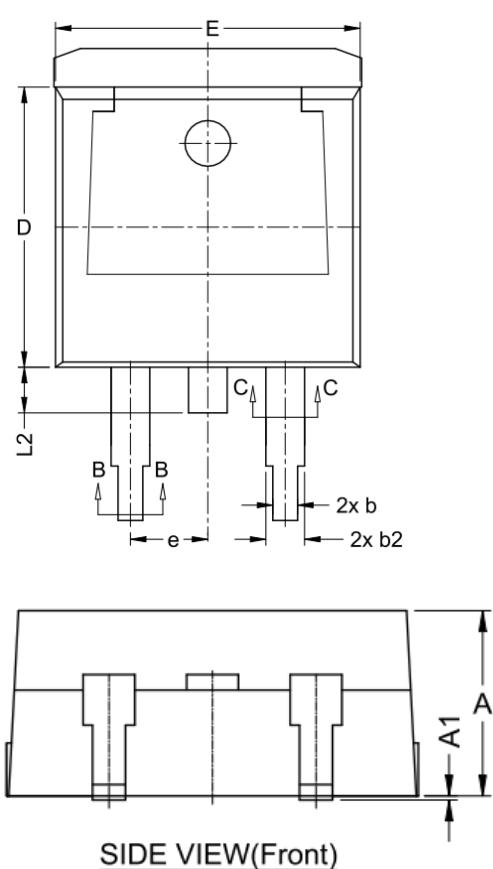
Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASJ360N65G1HE-R	J360N65	TO-263	Tape&Reel	800/Reel

PACKAGE	MARKING
TO-263	

Package Description

650V N-Channel Super-Junction MOSFET TO-263



DIM SYMBOL	MIN.	NOM.	MAX.
A	4.450	4.550	4.650
A1	0.000	—	0.150
A2	2.500	2.600	2.700
b	0.753	0.853	0.953
b1	0.713	0.813	0.913
b2	1.210	1.310	1.410
b3	1.170	1.270	1.370
c	0.330	0.421	0.521
c1	0.281	0.381	0.481
c2	1.210	1.310	1.410
D	9.100	9.200	9.300
D2	7.215	7.415	7.615
E	9.900	10.000	10.100
E1	9.900	10.100	10.300
E2	7.341	7.541	7.741
e	2.540 BSC.		
H	15.300	15.500	15.700
L	2.340	2.540	2.740
L1	1.066	1.266	1.466
L2	1.400	1.500	1.600
L3	0.264 BSC.		
theta	0°	---	5°

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