

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_b
650V	900mΩ@10V	5A

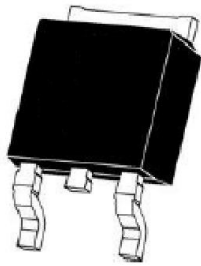
Feature

- Super Junction high voltage MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Application

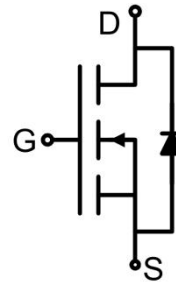
- Switching Mode Power Supplies(SMPS)
- PWM motor controls
- LED lighting
- Adapter

Package

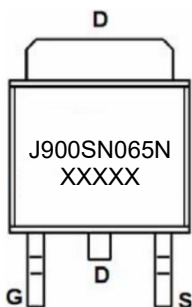


TO-252AB

Circuit diagram



Marking



Absolute maximum ratings (T_C=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	650	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current ^{1,3)} (V _{GS} =10V)	I _D	5	A
Continuous Drain Current ^{1,3)} (V _{GS} =10V, T _C =100°C)	I _D (100°C)	3.1	A
Pulsed Drain Current (t _p ≤10μs)	I _{DM}	9.5	A
Single Pulse Avalanche Energy ²⁾	E _{AS}	18.1	mJ
Power Dissipation ^{1,3)}	P _D	36.7	W
Thermal Resistance Junction to Case	R _{θJC}	3.4	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_J=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	650			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =650V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.2	3	3.8	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =1A		780	900	mΩ
Dynamic characteristics⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =325V, V _{GS} =0V, f =1MHz		252		pF
Output Capacitance	C _{oss}			8.2		
Reverse Transfer Capacitance	C _{rss}			1.1		
Total Gate Charge	Q _g	V _{DS} =325V, V _{GS} =10V I _D =3.8A		7.2		nC
Gate-Source Charge	Q _{gs}			0.9		
Gate-Drain Charge	Q _{gd}			3		
Turn-on delay time	t _{d(on)}	V _{DS} =325V, V _{GS} =10V I _D =3.8A, R _G =3Ω		2		nS
Turn-on rise time	t _r			3.4		
Turn-off delay time	t _{d(off)}			6.9		
Turn-off fall time	t _f			5.4		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	T _C =25°C			5	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =3.8A			1.2	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, V _R =325V, I _F =3.8A di/dt =-100A/us		140		nS
Reverse Recovery Charge	Q _{rr}			817		nC
Peak reverse recovery current	I _{rrm}			10		A

Notes:

- 1) The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- 2) T_J =25°C, V_G =10V, R_θ =25Ω, L =30mH, I_{AS} =1.1A.
- 3) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

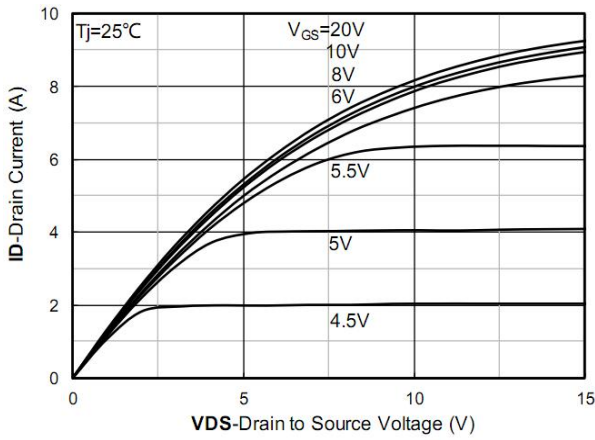


Figure 1. Output Characteristics; typical values

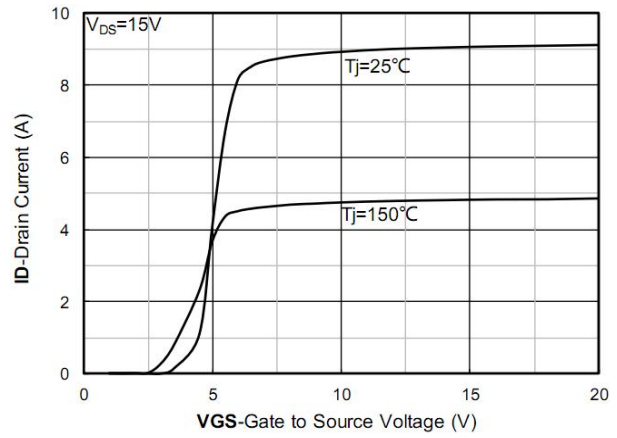


Figure 2. Transfer Characteristics; typical values

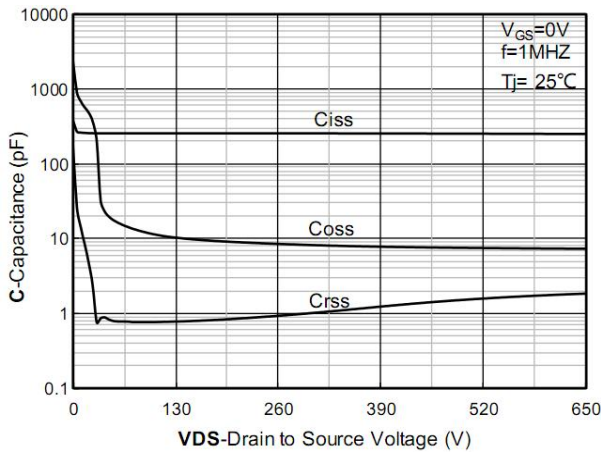


Figure 3. Capacitance Characteristics; typical values

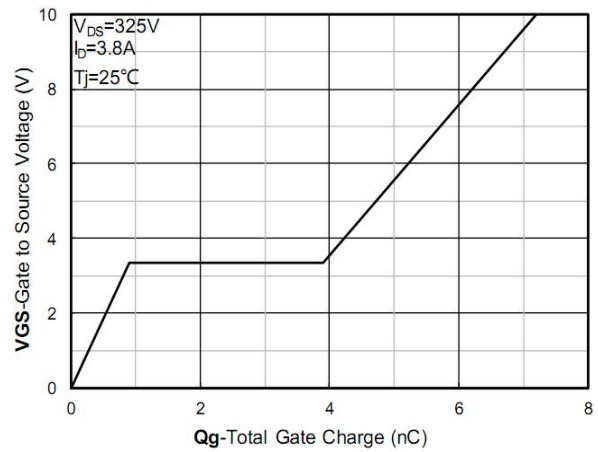


Figure 4. Gate Charge; typical values

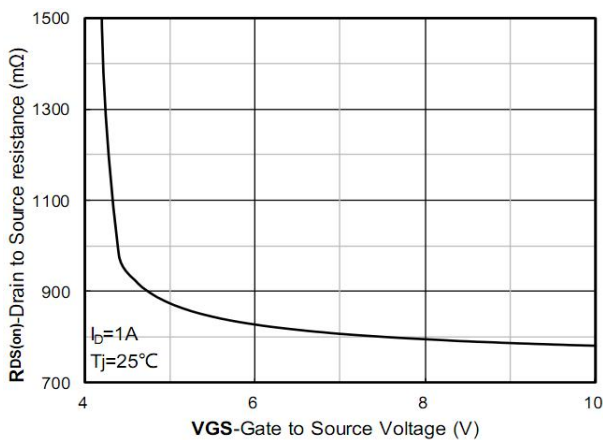


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

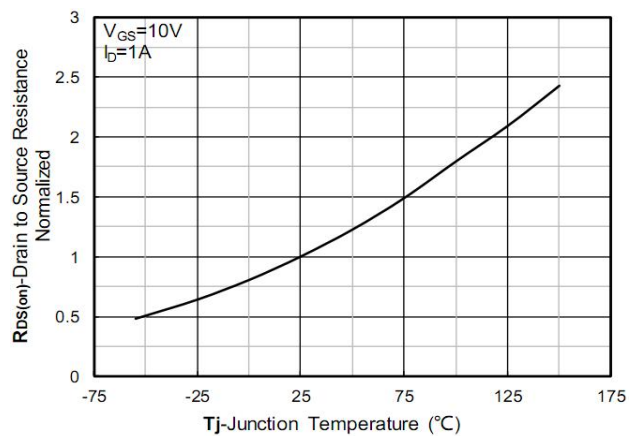


Figure 6. Normalized On-Resistance

Typical Characteristics

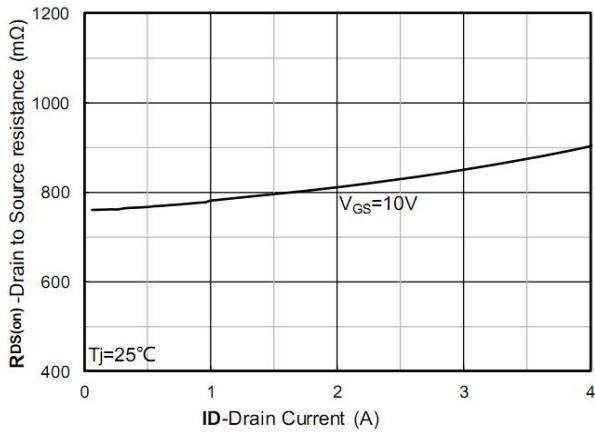


Figure 7. RDS(on) vs. Drain Current; typical values

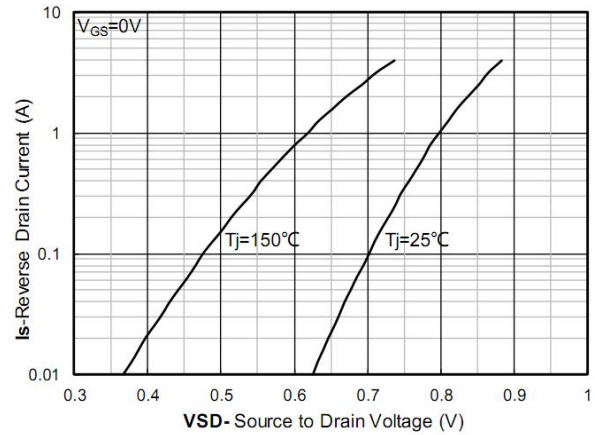


Figure 8. Forward characteristics of reverse diode; typical values

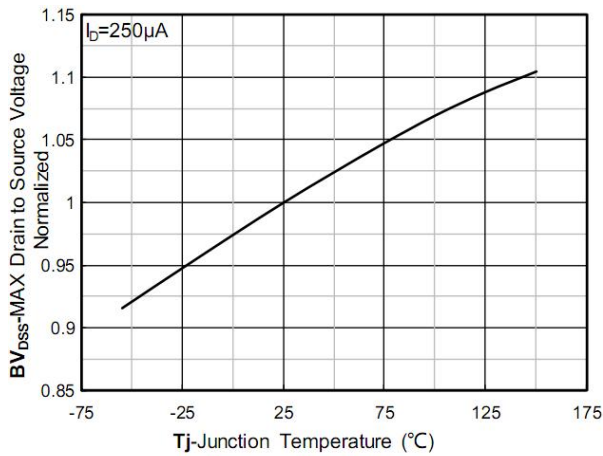


Figure 9. Normalized breakdown voltage

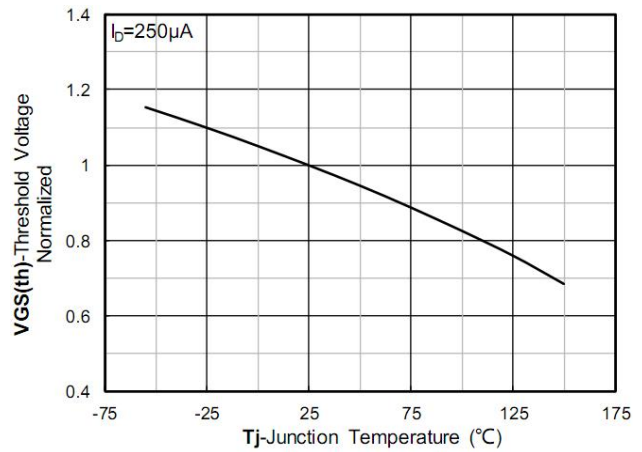


Figure 10. Normalized Threshold voltage

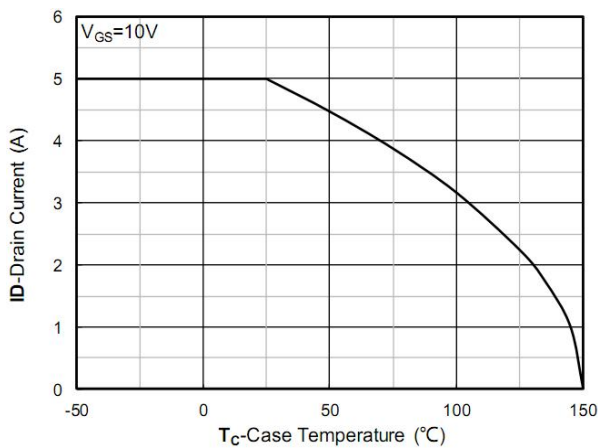


Figure 11. Current dissipation

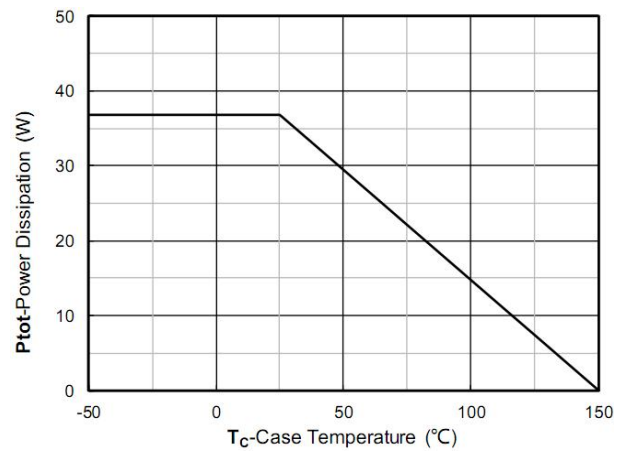


Figure 12. Power dissipation

Typical Characteristics

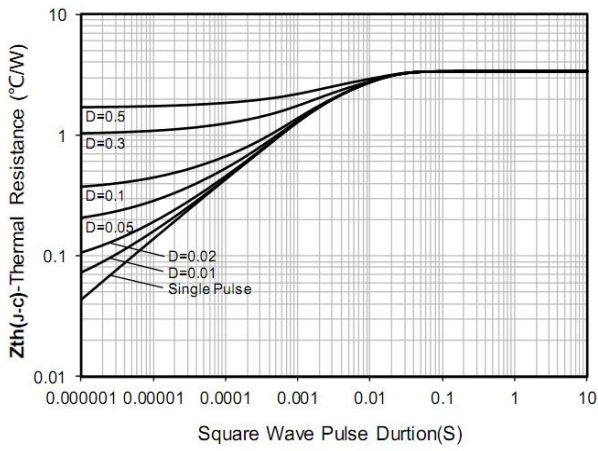


Figure 13. Maximum Transient Thermal Impedance

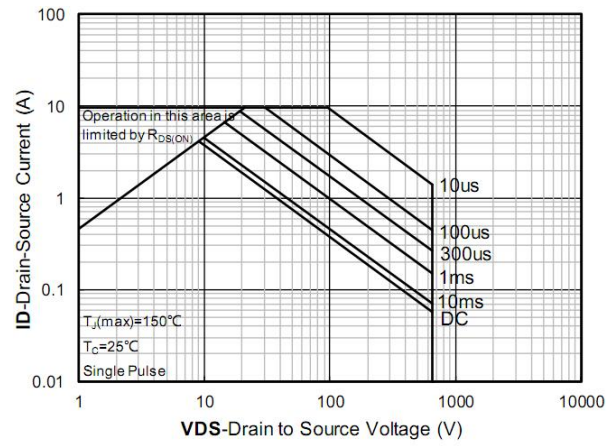
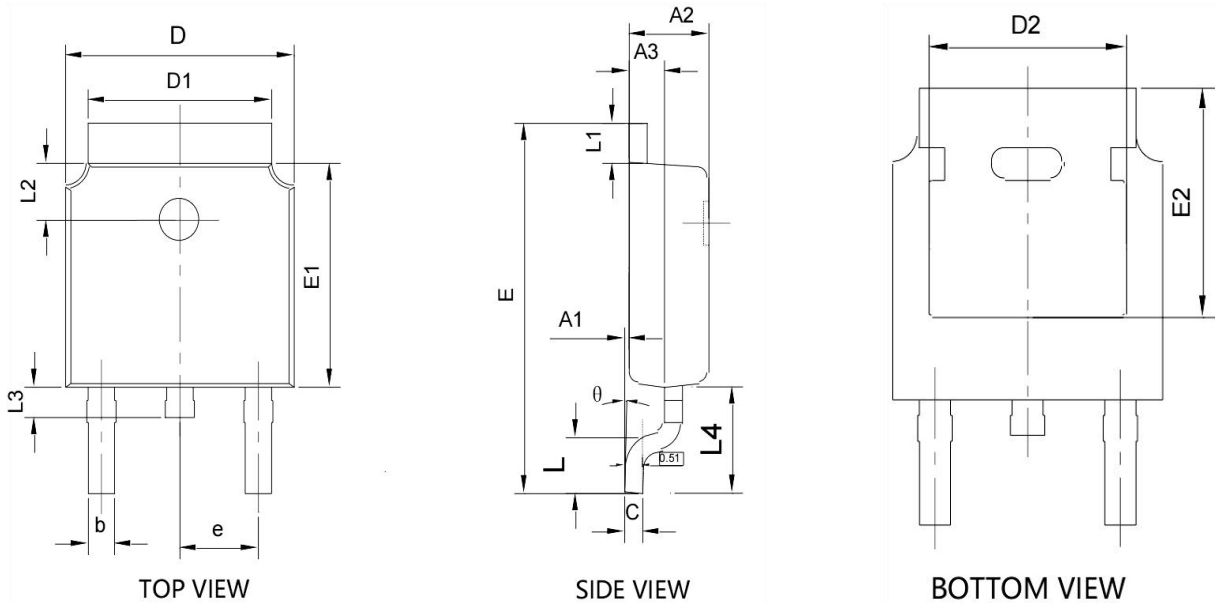


Figure 14. Safe Operation Area

TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A1	0.000	0.200	0.000	0.008
A2	2.200	2.400	0.087	0.094
A3	0.900	1.100	0.035	0.043
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.300	5.450	0.209	0.215
D2	4.600	4.950	0.181	0.195
E	9.900	10.300	0.390	0.406
E1	6.000	6.200	0.236	0.244
E2	5.150	5.450	0.203	0.215
e	2.286 BSC.		0.090 BSC.	
L	1.250	1.750	0.049	0.069
L1	0.900	1.270	0.035	0.050
L2	1.400	1.900	0.055	0.075
L3	0.600	1.000	0.024	0.039
L4	2.900 REF.		0.114 REF.	
θ	0°	10°	0°	10°