

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
650V	380mΩ@10V	12A

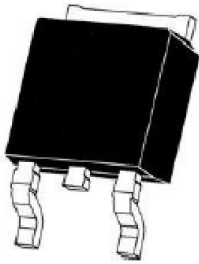
### Feature

- Super Junction High Voltage MOSFET technology
- Low  $R_{DS(on)}$  & FOM
- Extremely low switching loss
- Excellent stability and uniformity

### Application

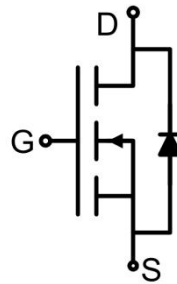
- Server power
- Charger
- PD Adapter

### Package

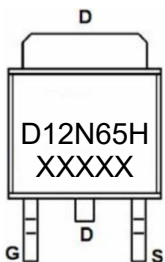


TO-252AB

### Circuit diagram



### Marking



### Absolute maximum ratings (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	650	V
Gate-Source Voltage	V <sub>GS</sub>	±30	V
Continuous Drain Current(T <sub>C</sub> =25 °C )	I <sub>D</sub>	12	A
Continuous Drain Current(T <sub>C</sub> =100 °C )	I <sub>D</sub> (100 °C)	7.5	A
Pulsed Drain Current <sup>1)</sup>	I <sub>DM</sub>	28	A
Power Dissipation <sup>3)</sup> (T <sub>C</sub> =25 °C )	P <sub>D</sub>	83	W
Thermal Resistance,Junction-to-Case	R <sub>θJC</sub>	1.5	°C/W
Single pulse avalanche energy <sup>2)</sup>	E <sub>AS</sub>	93	mJ
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

### Electrical characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	650			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =650V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.5	3.8	5	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =6A		280	380	mΩ
<b>Dynamic characteristics<sup>4)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =325V, V <sub>GS</sub> =0V, f =1MHz		1020		pF
Output Capacitance	C <sub>oss</sub>			30		
Reverse Transfer Capacitance	C <sub>rss</sub>			4		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =325V, V <sub>GS</sub> =10V, I <sub>D</sub> =6A		25		nC
Gate-Source Charge	Q <sub>gs</sub>			6		
Gate-Drain Charge	Q <sub>gd</sub>			11		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =325V, V <sub>GS</sub> =10V, I <sub>D</sub> =6A, R <sub>GEN</sub> =2.2Ω		12		nS
Turn-on rise time	t <sub>r</sub>			100		
Turn-off delay time	t <sub>d(off)</sub>			20		
Turn-off fall time	t <sub>f</sub>			7		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>				12	A
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =6A			1.2	V

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) T<sub>J</sub>=25°C, V<sub>DD</sub>=100V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=30mH, I<sub>AS</sub>=2.5A.
- 3) P<sub>d</sub> is based on max. junction temperature, using junction-case thermal resistance.
- 4) Guaranteed by design, not subject to production.

## Typical Characteristics

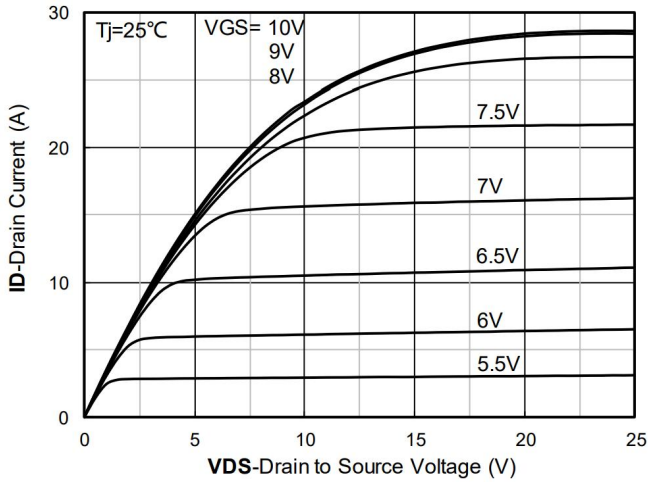


Figure 1. Output Characteristics

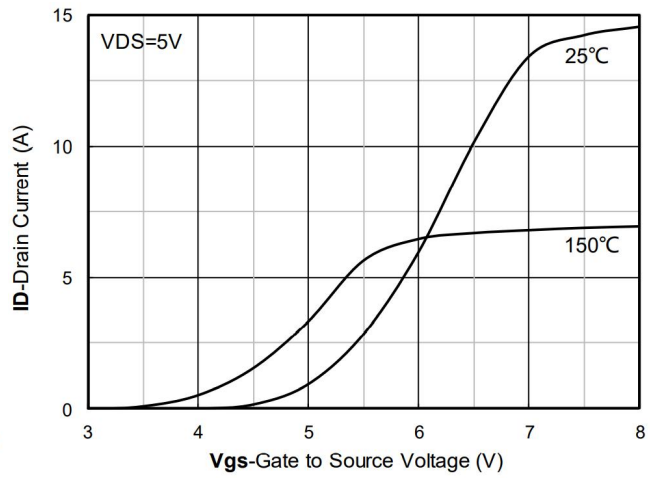


Figure 2. Transfer Characteristics

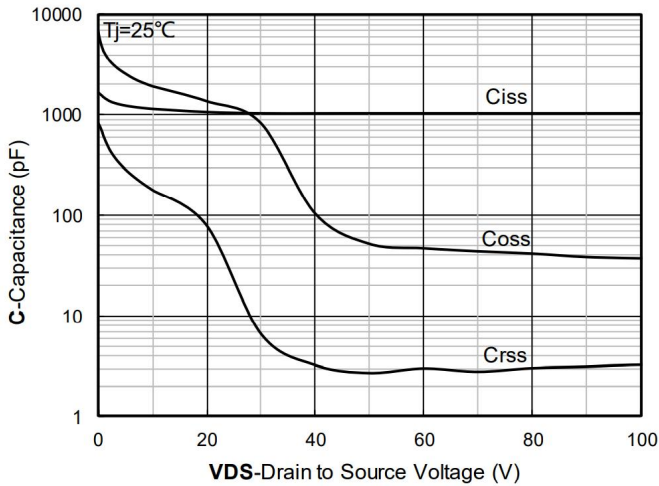


Figure 3. Capacitance Characteristics

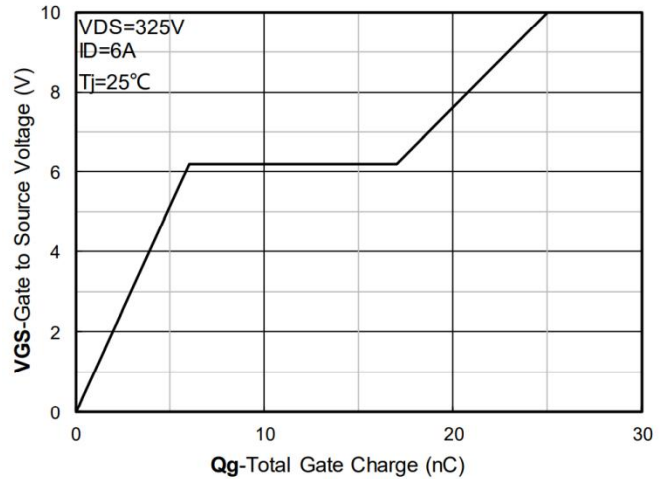


Figure 4. Gate Charge

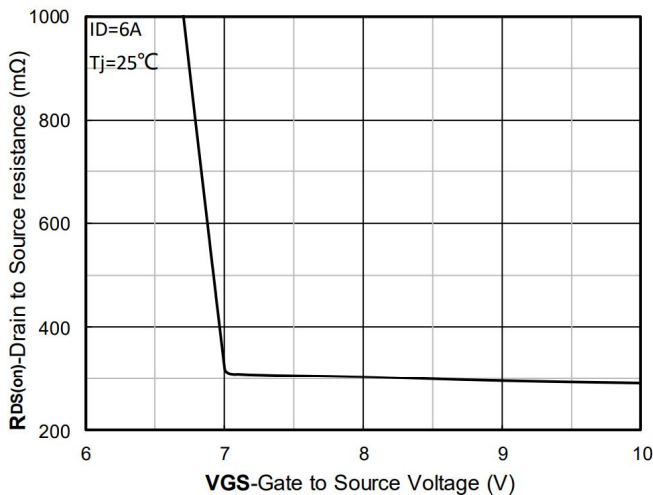


Figure 5. On-Resistance vs Gate to Source Voltage

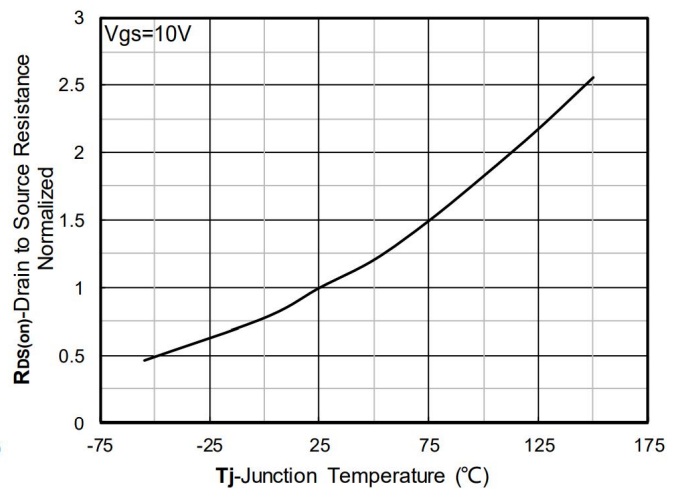


Figure 6. Normalized On-Resistance

## Typical Characteristics

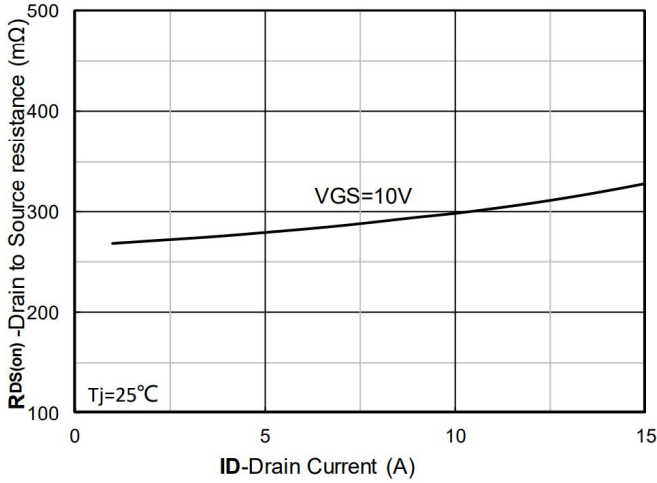


Figure 7. RDS(on) VS Drain Current

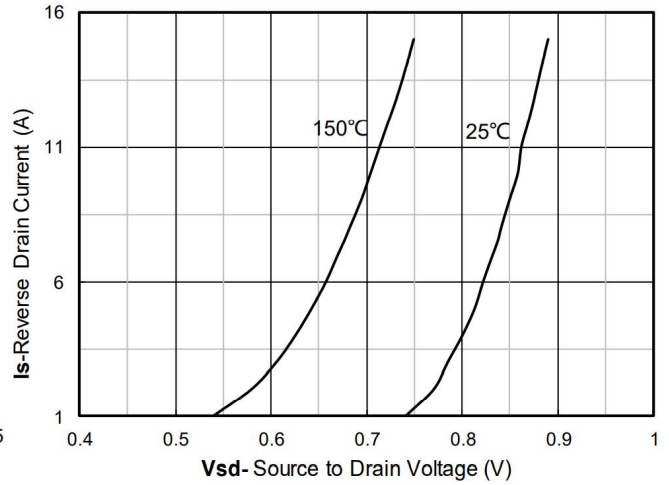


Figure 8. Forward characteristics of reverse diode

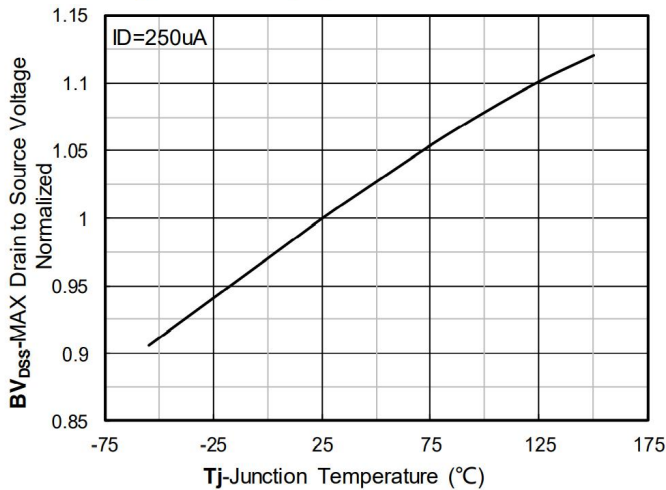


Figure 9. Normalized breakdown voltage

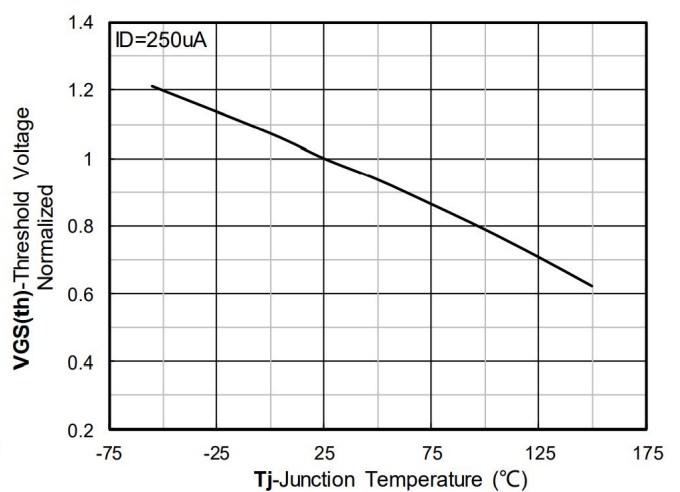


Figure 10. Normalized Threshold voltage

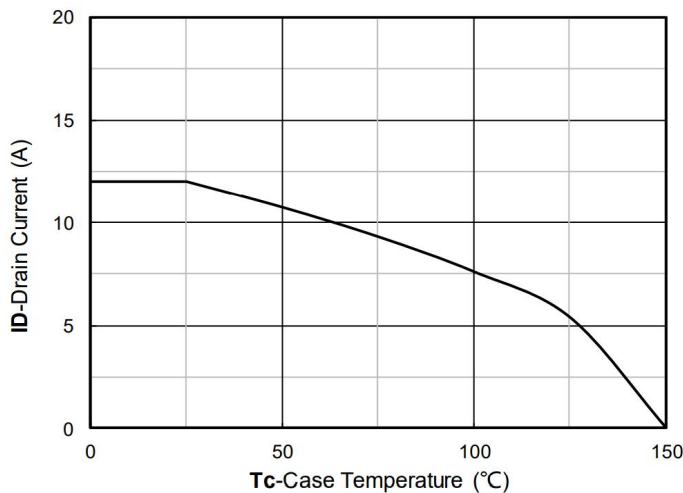


Figure 11. Current dissipation

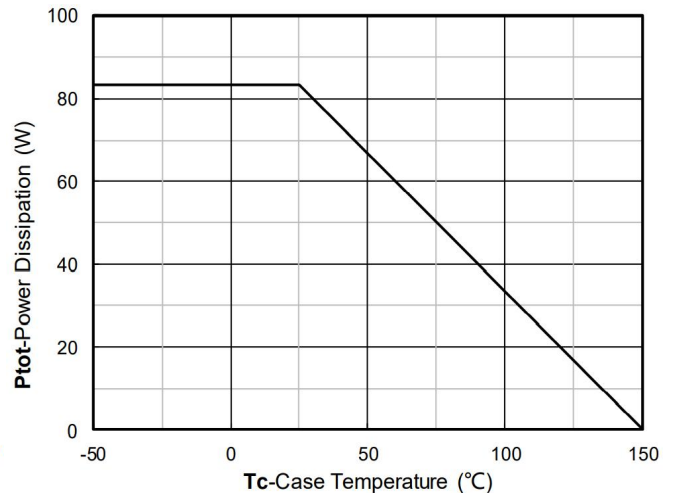


Figure 12. Power dissipation

## Typical Characteristics

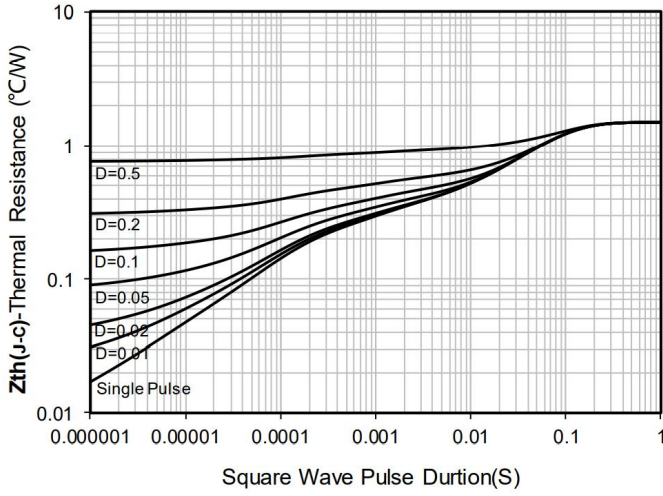


Figure 13. Maximum Transient Thermal Impedance

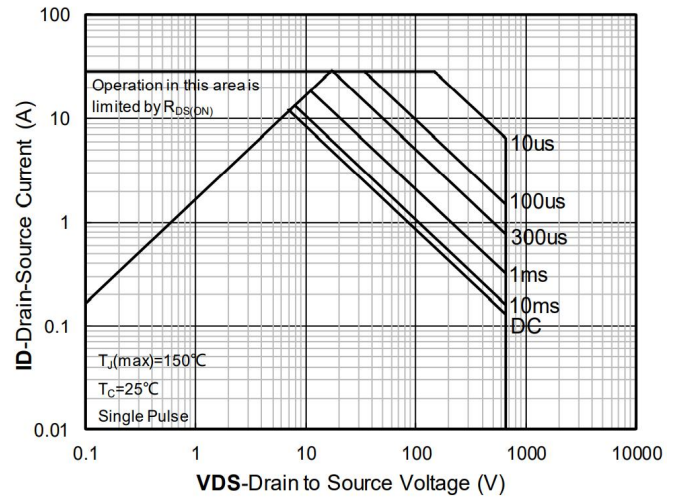
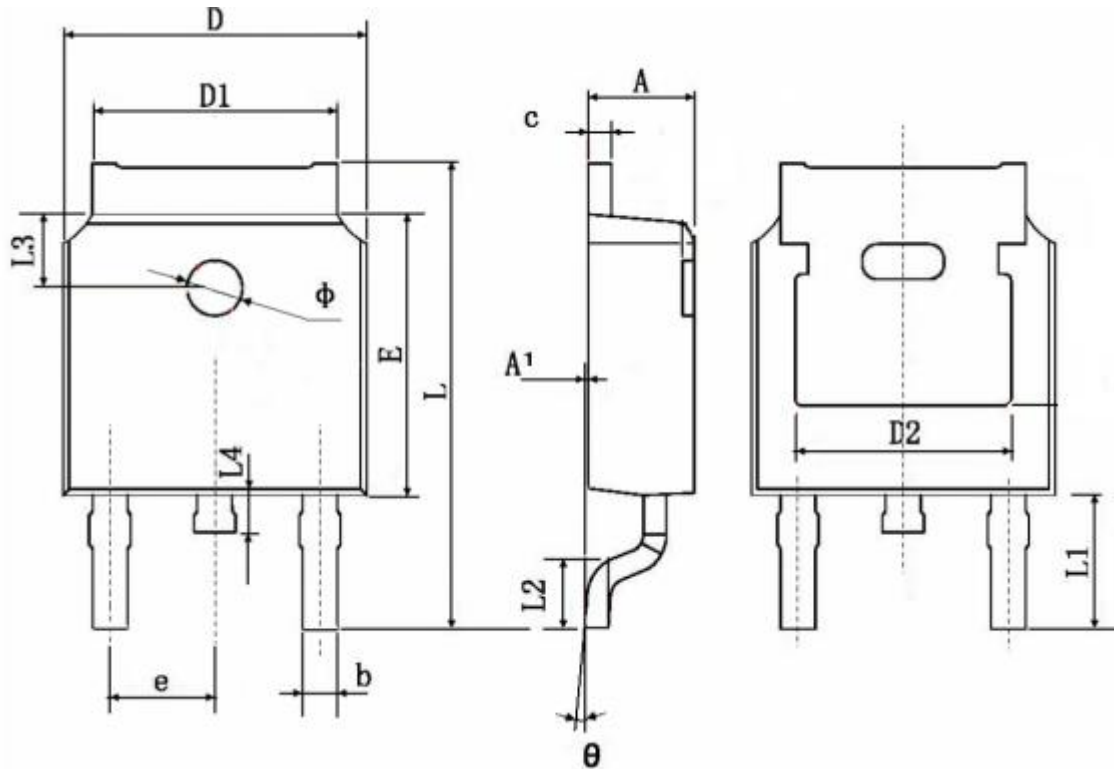


Figure 14. Safe Operation Area

### TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.200	0.000	0.008
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	5.100	5.500	0.201	0.217
D2	4.830 REF		0.190 REF	
E	6.000	6.200	0.236	0.244
e	2.286 BSC		0.090 BSC	
L	9.800	10.500	0.386	0.413
L1	2.900 REF		0.114 REF	
L2	1.250	1.800	0.049	0.070
L3	1.400	1.900	0.055	0.075
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	10°	0°	10°