

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	14mΩ@10V	35A
	20mΩ@4.5V	

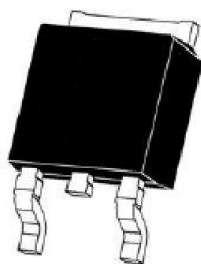
Feature

- Fast Switching
- Low Gate Charge and Rdson

Application

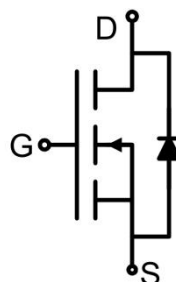
- DC-DC Converter
- Load Switching

Package

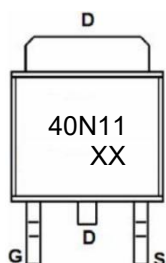


TO-252AB

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^\circ\text{C}$)	I_D	35	A
Continuous Drain Current ($T_C=100^\circ\text{C}$)	$I_{D(100^\circ\text{C})}$	23	A
Pulsed Drain Current	I_{DM}	140	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	20	mJ
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	35	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	3.6	$^\circ\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

Electrical characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

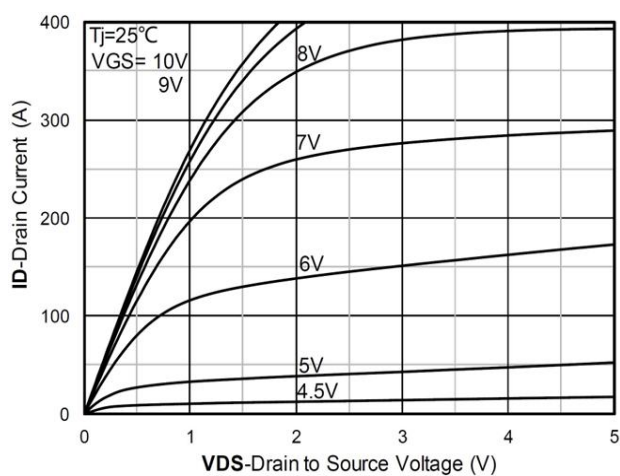
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =32V, V _{GS} =0V, T _J =25°C			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =8A		11	14	mΩ
		V _{GS} =4.5V, I _D =4A		14	20	
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f =1MHz		1013		pF
Output Capacitance	C _{oss}			109		
Reverse Transfer Capacitance	C _{rss}			96		
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =4.5V, I _D =8A		22.9		nC
Gate-Source Charge	Q _{gs}			3.5		
Gate-Drain Charge	Q _{gd}			5.3		
Turn-on delay time	t _{d(on)}	V _{DS} =15V, V _{GS} =10V, I _D =8A R _G =1.5Ω		5.5		nS
Turn-on rise time	t _r			14		
Turn-off delay time	t _{d(off)}			24		
Turn-off fall time	t _f			12		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				35	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C			1.2	V
Reverse recover time	T _{rr}	I _F =10A, di/dt =-100A/us		12		nS
Reverse recovery charge	Q _{rr}	T _J =25°C		5		nC

Notes:

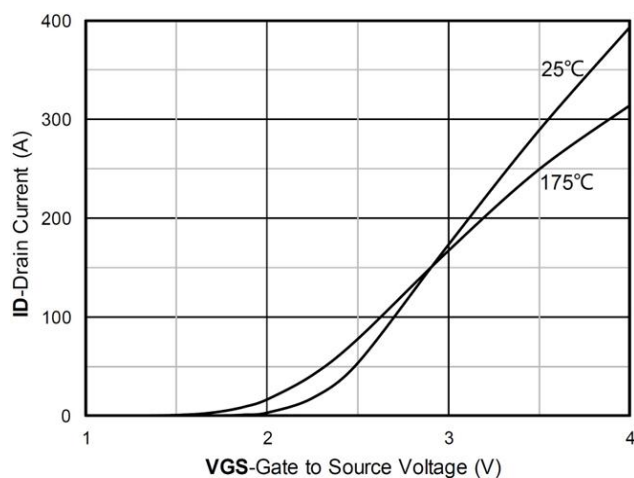
1) The EAS test condition is $V_{DD}=20V, V_{GS}=10V, L=0.1mH, R_G=25\Omega$.

2) Guaranteed by design, not subject to production.

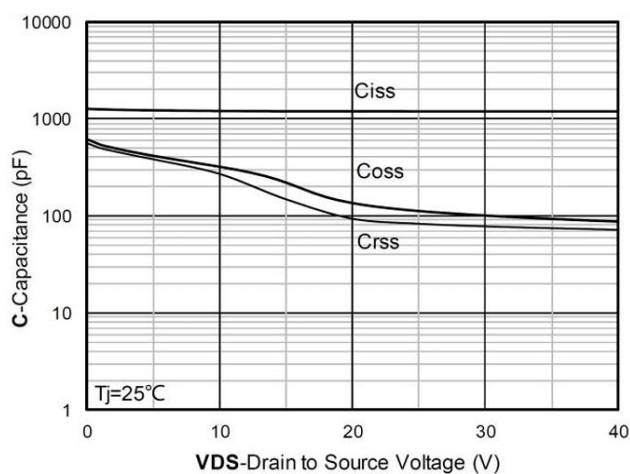
Typical Characteristics



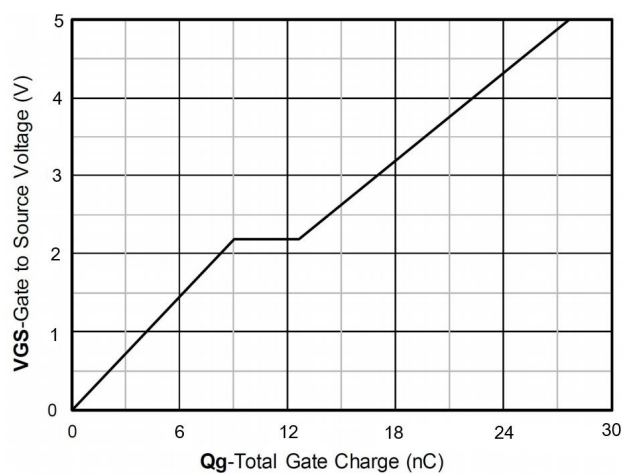
Output Characteristics



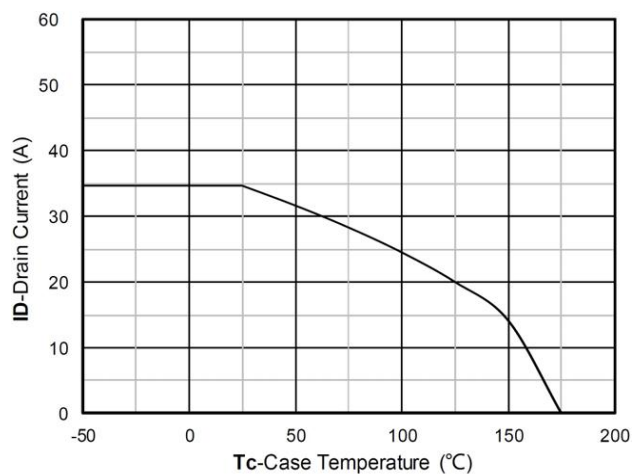
Transfer Characteristics



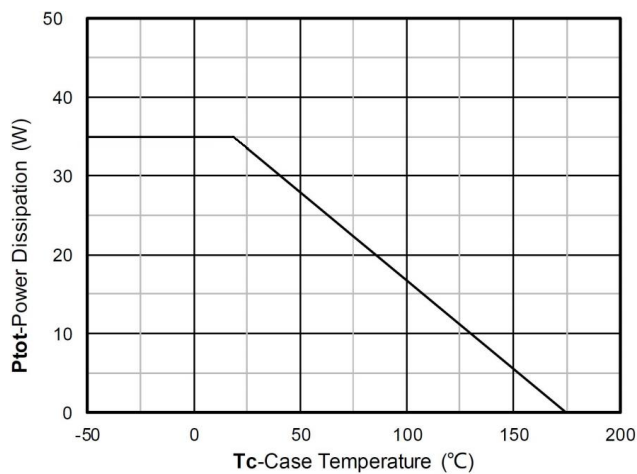
Capacitance Characteristics



Gate Charge

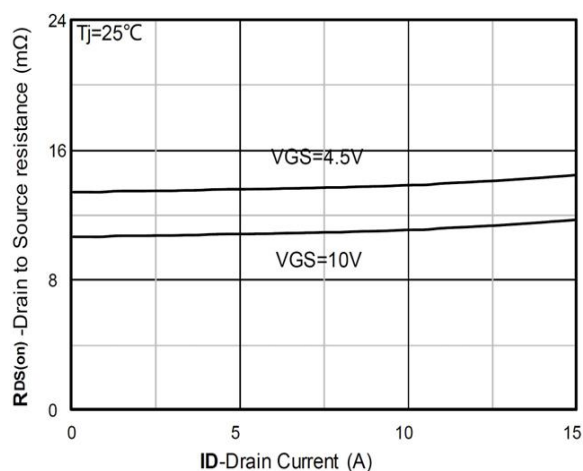


Current dissipation

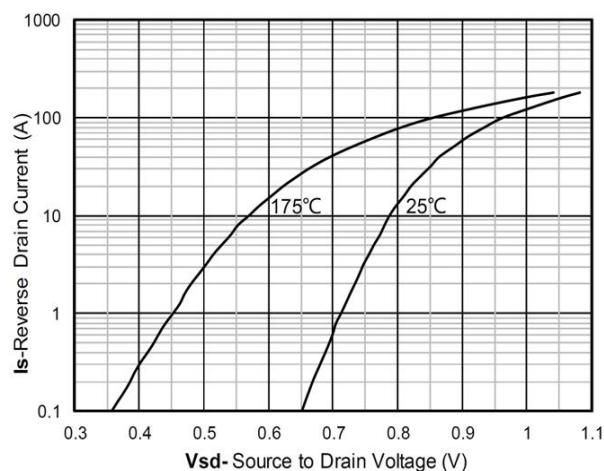


Power dissipation

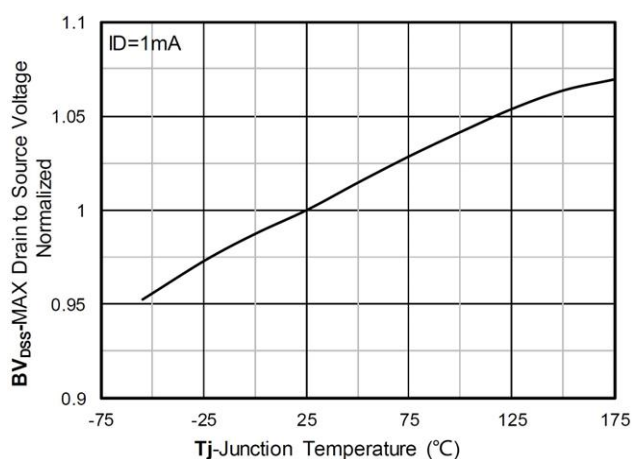
Typical Characteristics



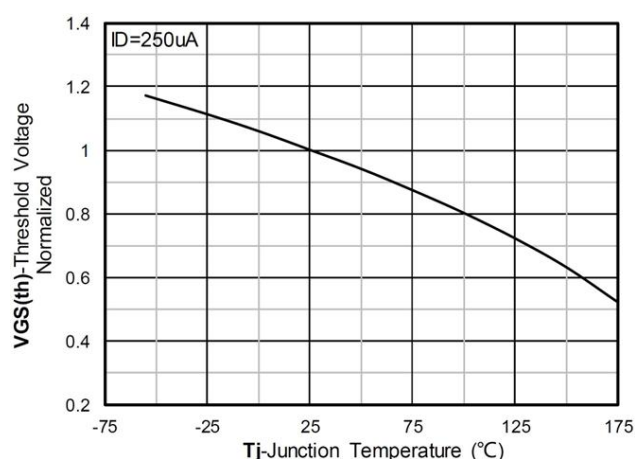
$R_{DS(on)}$ VS Drain Current



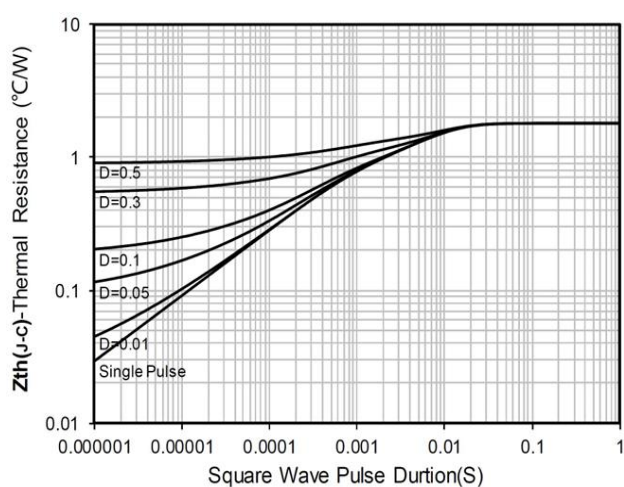
Forward characteristics of reverse diode



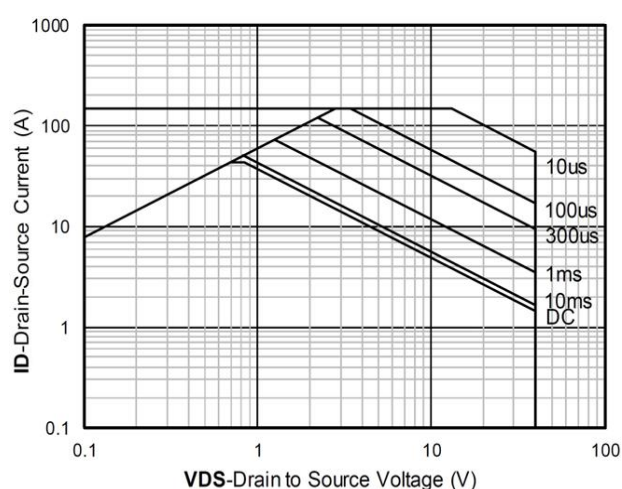
Normalized breakdown voltage



Normalized Threshold voltage

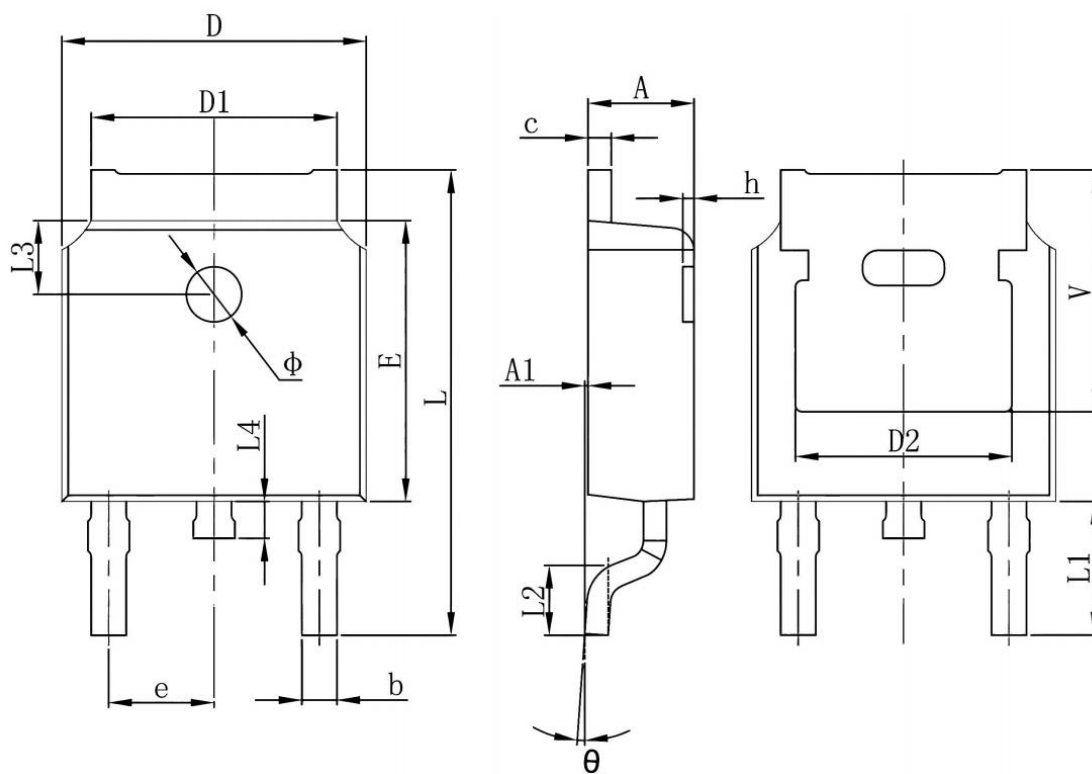


Maximum Transient Thermal Impedance



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	0.127	0.000	0.005
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	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	