

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	19mΩ@10V	45A
	23mΩ@4.5V	

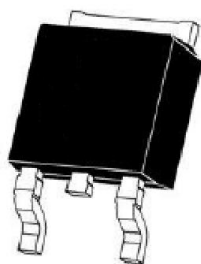
Feature

- Fast switching
- Low gate charge and $R_{DS(on)}$

Application

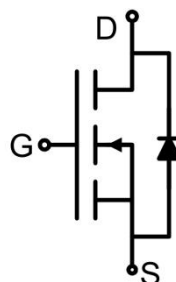
- DC/DC converter
- Load switching

Package

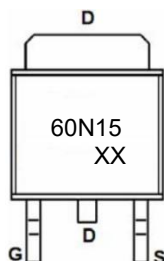


TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	45	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	53	A
Pulsed Drain Current	I_{DM}	180	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	121	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	40	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	3.1	$^{\circ}\text{C/W}$
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)

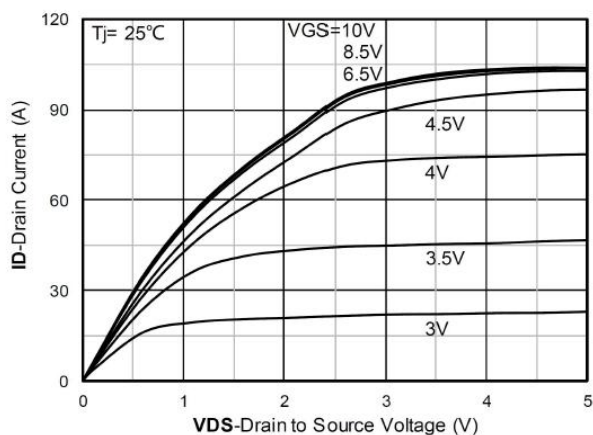
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=48V, V_{GS}=0V, T_J=25^{\circ}C$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.8	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15A$		15	19	m Ω
		$V_{GS}=4.5V, I_D=10A$		17	23	
Dynamic characteristics ²⁾						
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, f=1MHz$		2050		pF
Output Capacitance	C_{oss}			150		
Reverse Transfer Capacitance	C_{rss}			120		
Total Gate Charge	Q_g	$V_{DS}=30V, V_{GS}=10V, I_D=20A$		38		nC
Gate-Source Charge	Q_{gs}			5.6		
Gate-Drain Charge	Q_{gd}			10.4		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=30V, V_{GS}=10V, I_D=20A$ $R_G=3\Omega$		7.8		nS
Turn-on rise time	t_r			47		
Turn-off delay time	$t_{d(off)}$			29		
Turn-off fall time	t_f			31		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				45	A
Diode Forward voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}C$			1.2	V
Reverse Recovery Time	T_{rr}	$I_S=20A, di/dt=100A/\mu s$		20		nS
Reverse Recovery Charge	Q_{rr}	$T_J=25^{\circ}C$		83		nC

Notes:

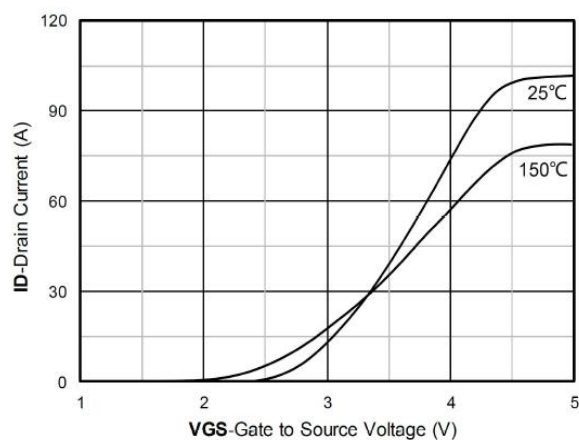
 1) The EAS test condition is $V_{DD}=30V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$.

2) Guaranteed by design, not subject to production testing.

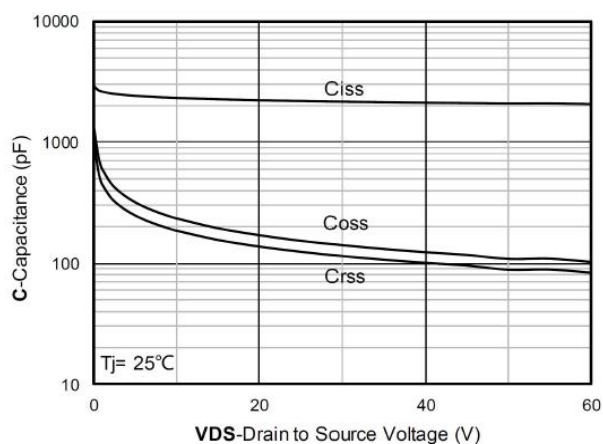
Typical Characteristics



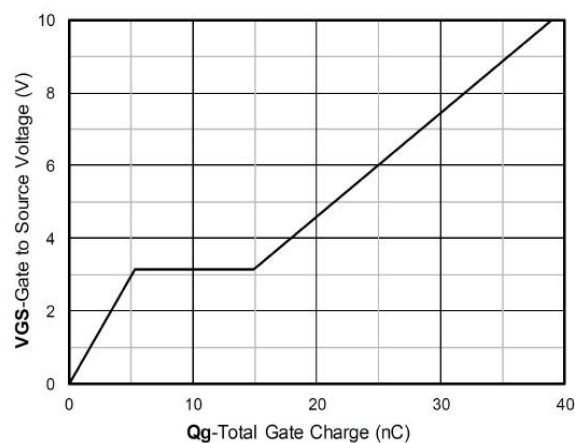
Output Characteristics



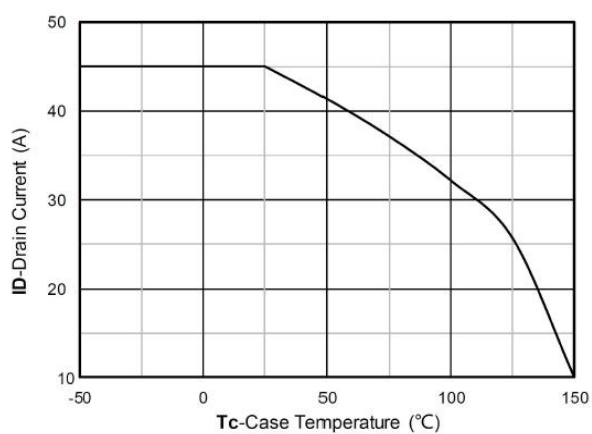
Transfer Characteristics



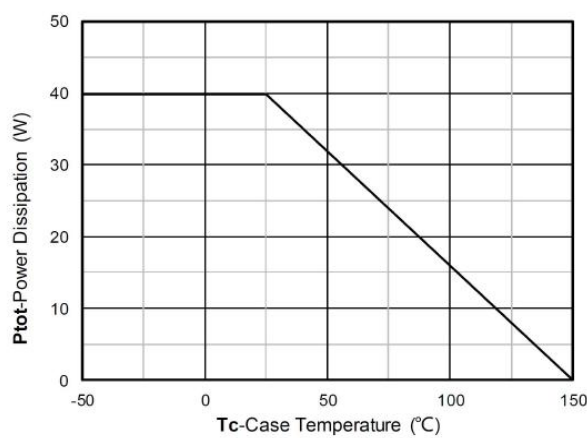
Capacitance Characteristics



Gate Charge

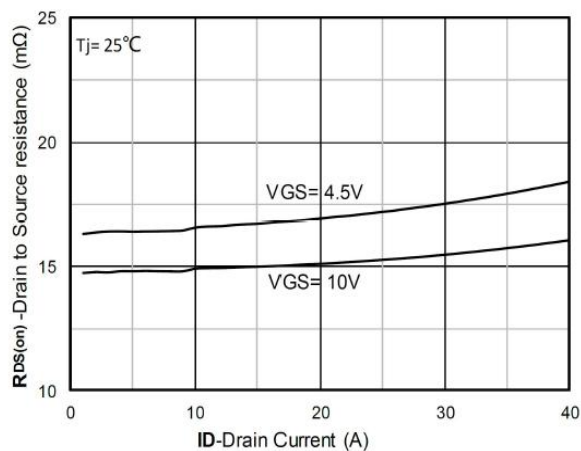


Current dissipation

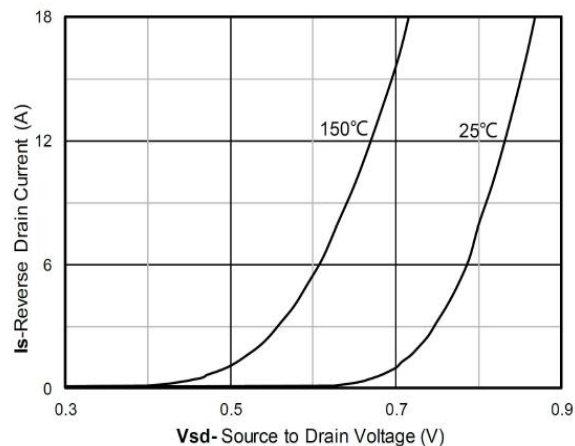


Power dissipation

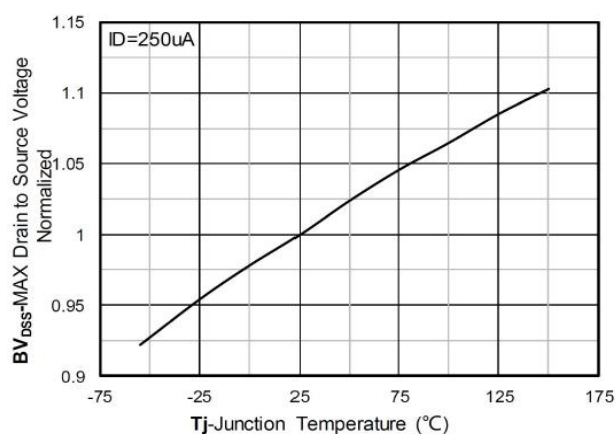
Typical Characteristics



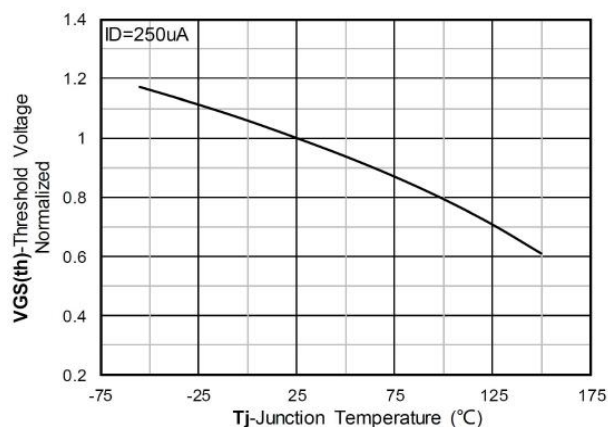
$R_{DS(on)}$ VS Drain Current



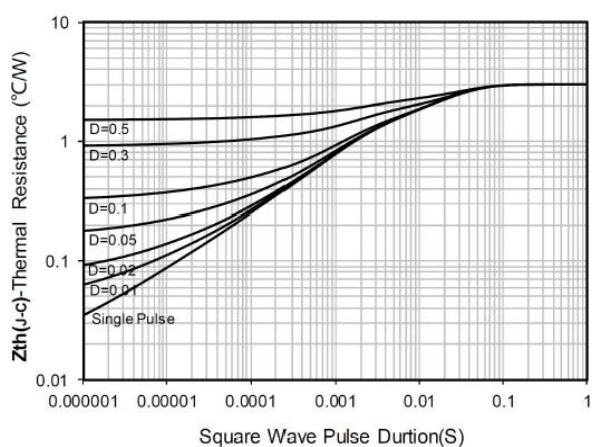
Forward characteristics of reverse diode



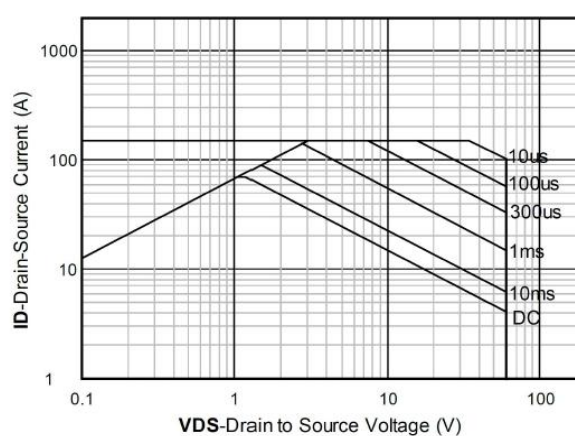
Normalized breakdown voltage



Normalized Threshold voltage

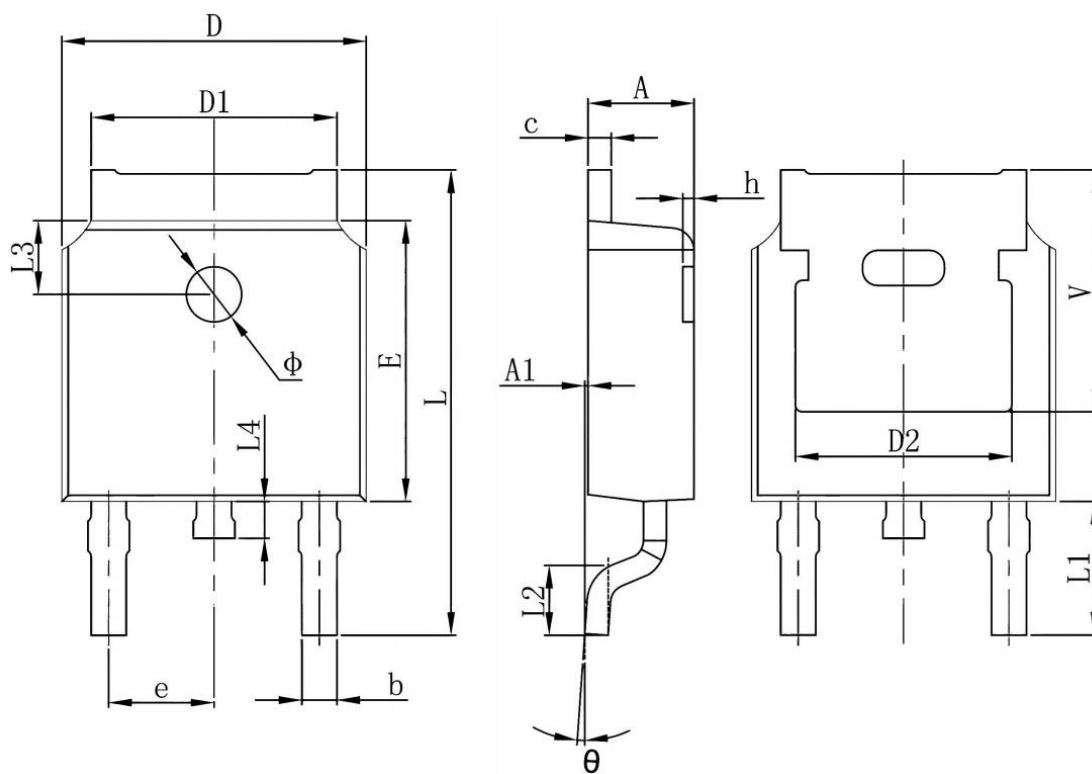


Maximum Transient Thermal Impedance



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
phi	1.100	1.300	0.043	0.051
theta	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	