

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	12mΩ@-10V	-50A
	15mΩ@-4.5V	

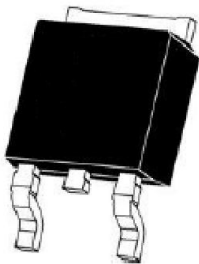
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Application

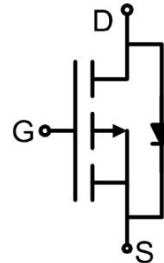
- Load switch
- Power management
- Portable equipment

Package

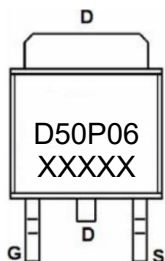


TO-252AB

Circuit diagram



Marking



Absolute maximum ratings (Ta=25°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	I _D	-50	A
Pulsed Drain Current	I _{DM}	-150	A
Power Dissipation	P _D	89	W
Thermal Resistance, Junction-to-Case	R _{θJC}	1.4	°C/W
Single pulse avalanche energy	E _{AS}	169	mJ
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_A=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	-60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -60V, V _{GS} = 0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0		-3.5	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} = -10V, I _D = -25A		9	12	mΩ
		V _{DS} = -4.5V, I _D = -20A		11	15	
Dynamic characteristics²⁾						
Input Capacitance	C _{iss}	V _{DS} = -30V, V _{GS} = 0V, f = 1MHz		4260		pF
Output Capacitance	C _{oss}			690		
Reverse Transfer Capacitance	C _{rss}			145		
Total Gate Charge	Q _g	V _{DS} = -30V, V _{GS} = -10V, I _D = -25A		79		nC
Gate-Source Charge	Q _{gs}			18		
Gate-Drain Charge	Q _{gd}			18		
Turn-on delay time	t _{d(on)}	V _{DD} = -30V, V _{GS} = -10V, I _D = -25A, R _{GEN} = 3Ω		17		nS
Turn-on rise time	t _r			88		
Turn-off delay time	t _{d(off)}			120		
Turn-off fall time	t _f			110		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I _S				-50	A
Diode Forward voltage	V _{DS}	V _{GS} = 0V, I _S = -25A			-1.2	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = -25A		52		nS
Reverse Recovery Charge	Q _{rr}	di/dt = -100A/μs ¹⁾		96		nC

Notes:

- 1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.
- 2) Guaranteed by design, not subject to production testing.

Typical Characteristics

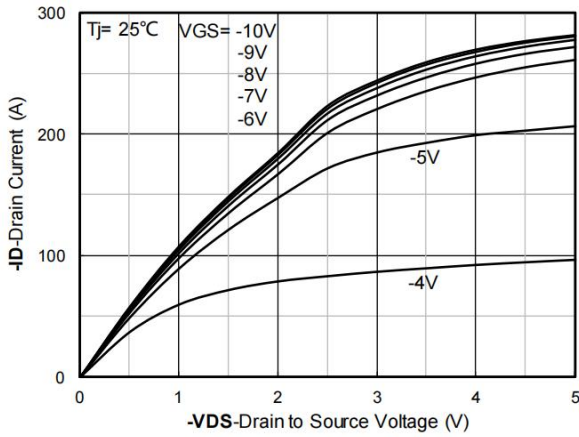


Figure 1. Output Characteristics

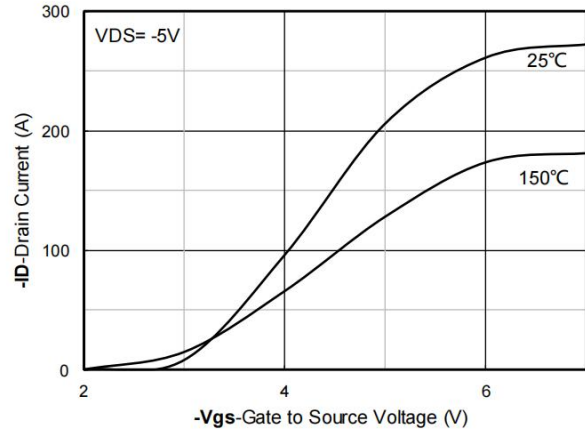


Figure 2. Transfer Characteristics

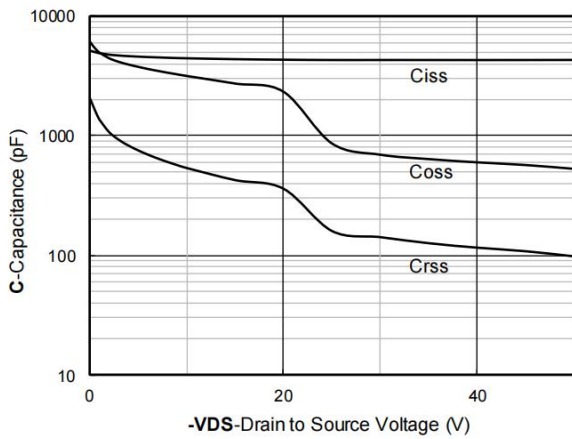


Figure 3. Capacitance Characteristics

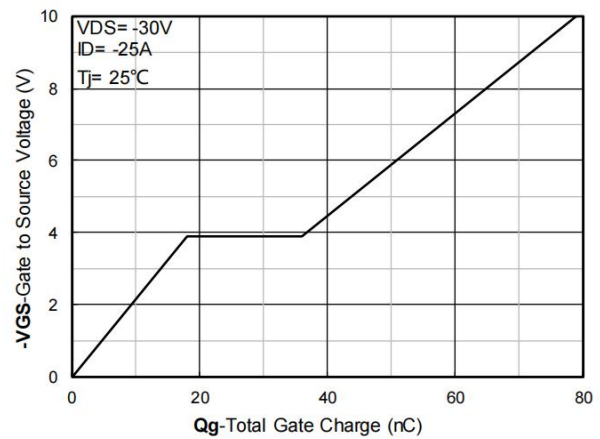


Figure 4. Gate Charge

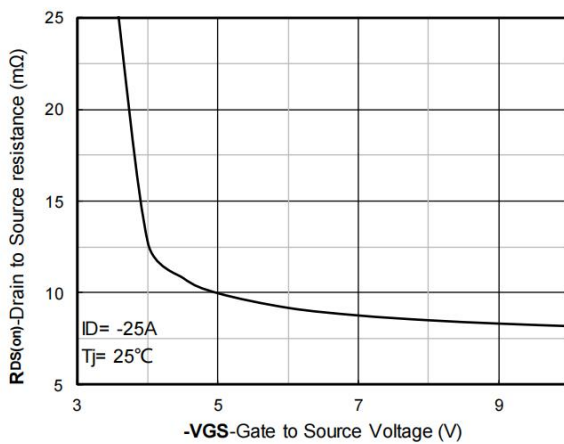


Figure 5. On-Resistance vs Gate to Source Voltage

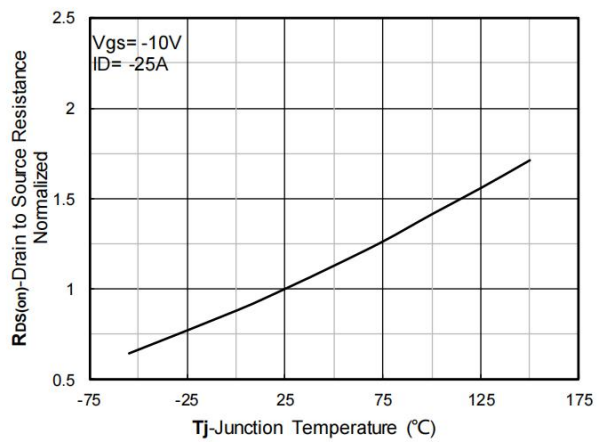


Figure 6. Normalized On-Resistance

Typical Characteristic

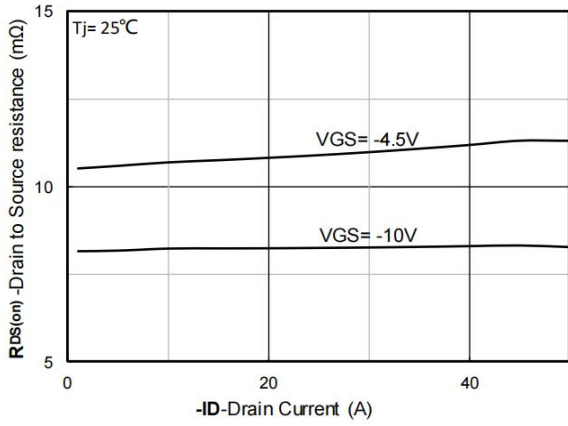


Figure 7. RDS(on) VS Drain Current

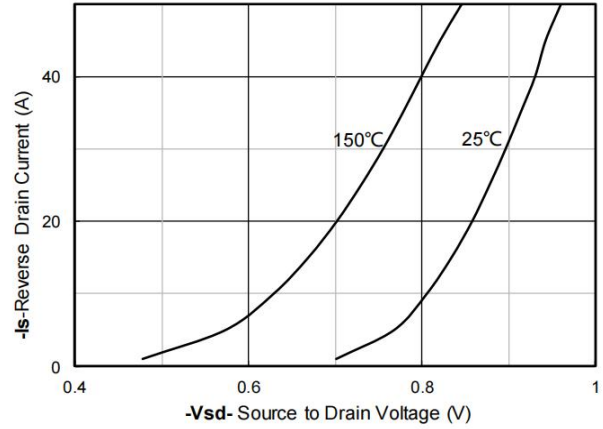


Figure 8. Forward characteristics of reverse diode

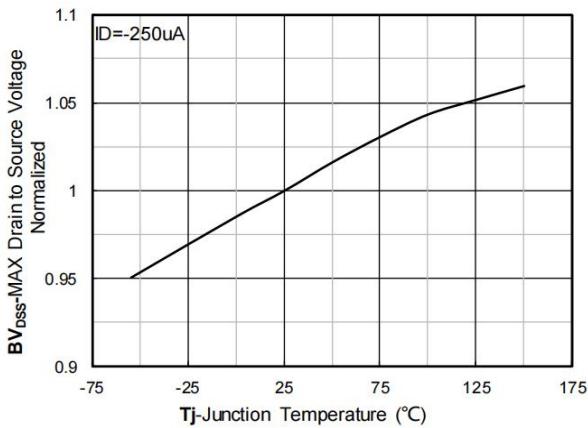


Figure 9. Normalized breakdown voltage

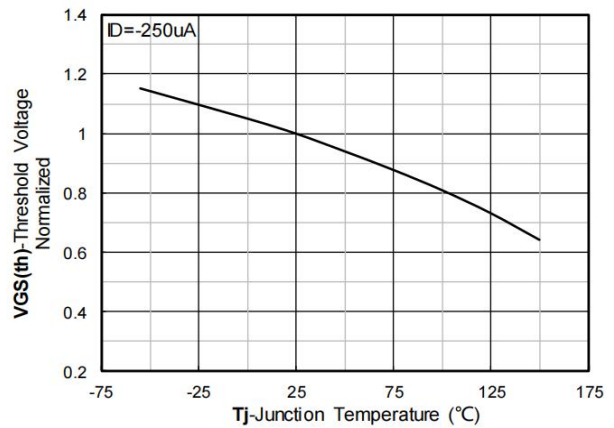


Figure 10. Normalized Threshold voltage

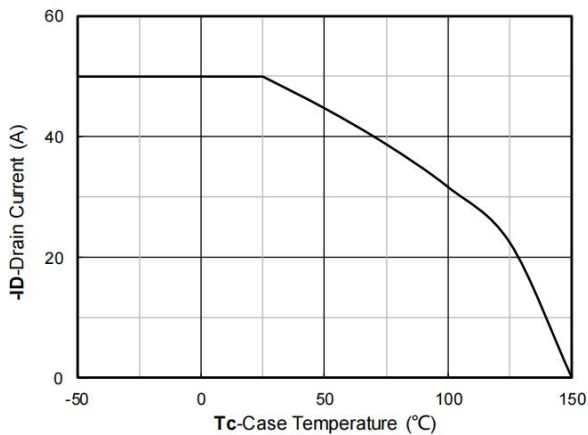


Figure 11. Current dissipation

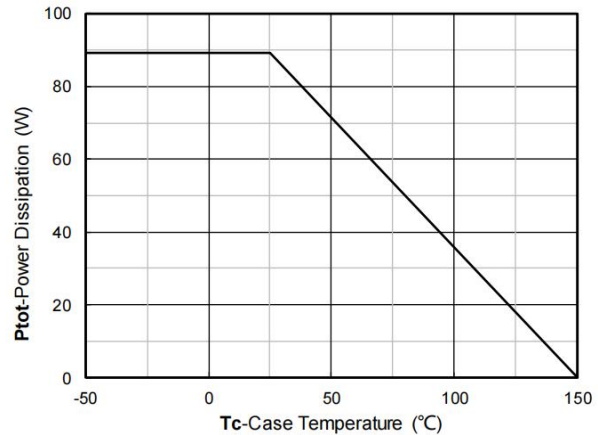


Figure 12. Power dissipation

Typical Characteristics

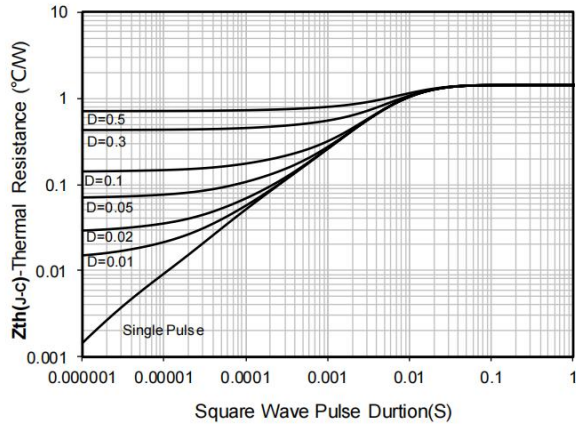


Figure 13. Maximum Transient Thermal Impedance

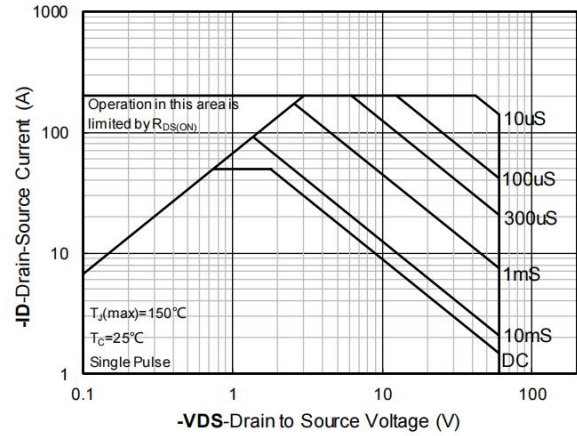
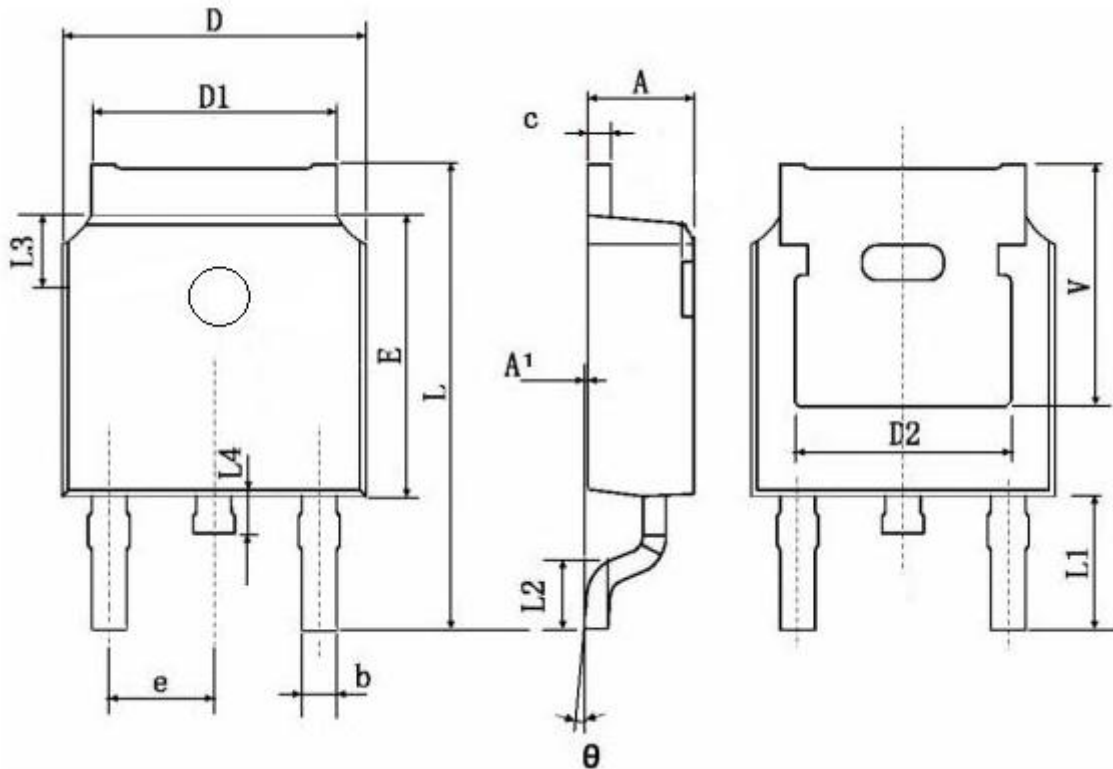


Figure 14. Safe Operation Area

TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.086	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	4.600	4.950	0.181	0.189
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 BSC		0.114 BSC	
L2	1.250	1.750	0.049	0.069
L3	1.400	1.900	0.055	0.075
L4	0.600	1.000	0.023	0.039
V	5.100	5.500	0.201	0.217
θ	0°	10°	0°	10°