

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	3.8mΩ@10V	-150A
	5.5mΩ@4.5V	

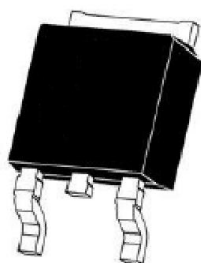
Feature

- Advanced trench technology
- Excellent $R_{DS(on)}$
- Low gate charge

Application

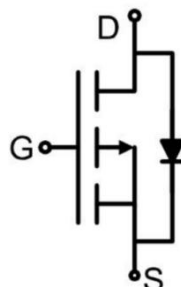
- Battery protection
- Load Switch
- Uninterruptible power supply

Package

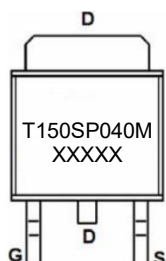


TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹⁾ ($V_{GS}=-10\text{V}$)	I_D	-150	A
Continuous Drain Current ¹⁾ ($V_{GS}=-10\text{V}$, $T_c=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	-110	A
Pulsed Drain Current ²⁾	I_{DM}	-540	A
Power Dissipation ⁴⁾	P_D	139	W
Single Pulse Avalanche Energy ³⁾	E_{AS}	1020	mJ
Avalanche Current	I_{AS}	-80	A
Thermal Resistance from Junction to Case ¹⁾	$R_{\theta JC}$	0.9	$^{\circ}\text{C/W}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$, 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} = -40V, 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	-1.2	-1.8	-2.5	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} = -10V, I _D = -20A		3.1	3.8	mΩ
		V _{GS} = -4.5V, I _D = -10A		4.2	5.5	
Dynamic characteristics ⁵⁾						
Input Capacitance	C _{iss}	V _{DS} = -20V, V _{GS} = 0V, f = 1MHz		13276		pF
Output Capacitance	C _{oss}			1900		
Reverse Transfer Capacitance	C _{rss}			1470		
Total Gate Charge	Q _g	V _{DS} = -20V, V _{GS} = -10V, I _D = -40A		236		nC
Gate-Source Charge	Q _{gs}			26		
Gate-Drain Charge	Q _{gd}			44		
Turn-on delay time	t _{d(on)}	V _{DD} = -20V, V _{GS} = -10V, I _D = -40A, R _G = 3Ω		32		nS
Turn-on rise time	t _r			34		
Turn-off delay time	t _{d(off)}			136		
Turn-off fall time	t _f			40		
Source-Drain Diode characteristics						
Diode Forward voltage ²⁾	V _{SD}	V _{GS} = 0V, I _S = -1A			-1.2	V

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2) The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- 3) The EAS data shows Max. rating. The test condition is $V_{DD} = -32\text{V}$, $V_{GS} = -10\text{V}$, $L = 0.1\text{mH}$, $I_{AS} = -80\text{A}$.
- 4) The power dissipation is limited by 150°C junction temperature.
- 5) Guaranteed by design, not subject to production testing.

Typical Characteristics

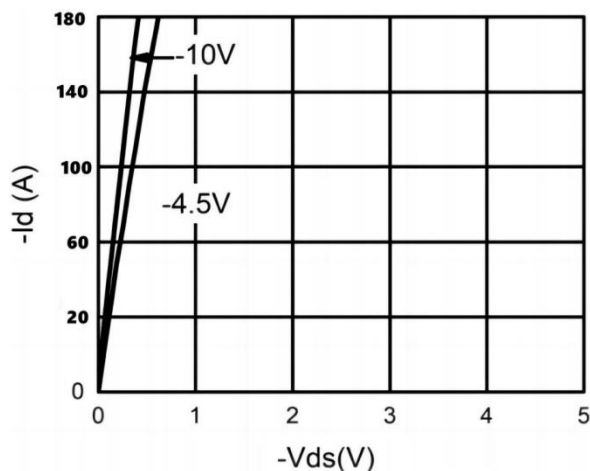


Fig 1. Output Characteristics

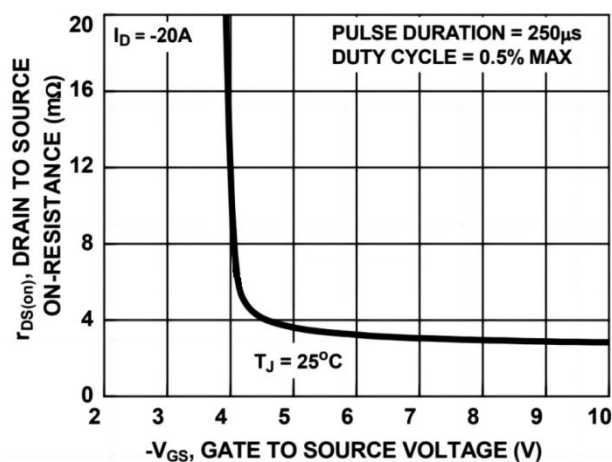


Fig 2. RDSON vs. Gate Voltage

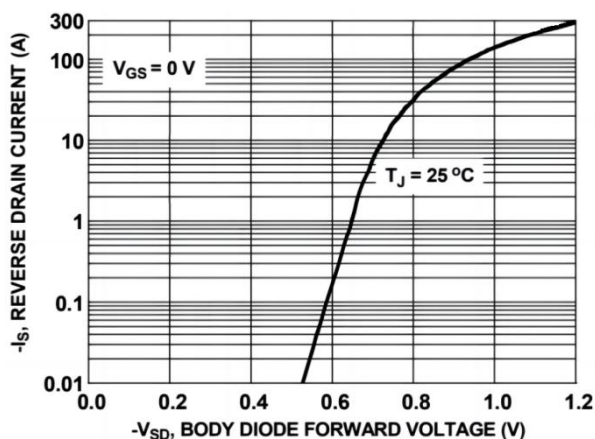


Fig3. Forward Diode Characteristics

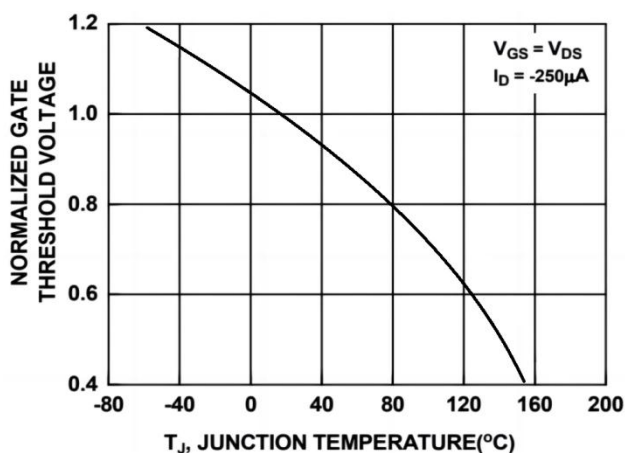


Fig4. Normalized Gate Threshold Voltage vs. Temperature

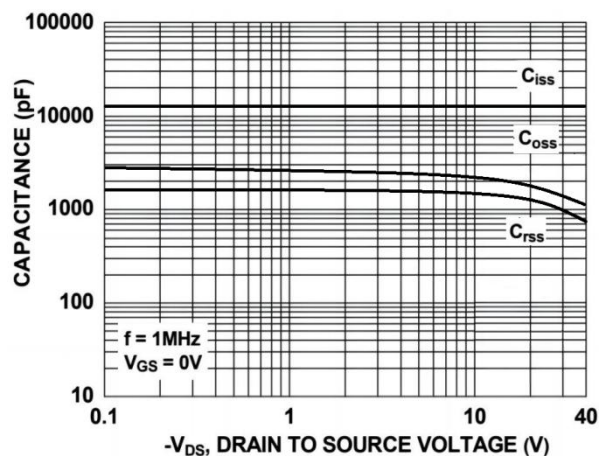


Fig5. Capacitance vs. Drain to Source Voltage

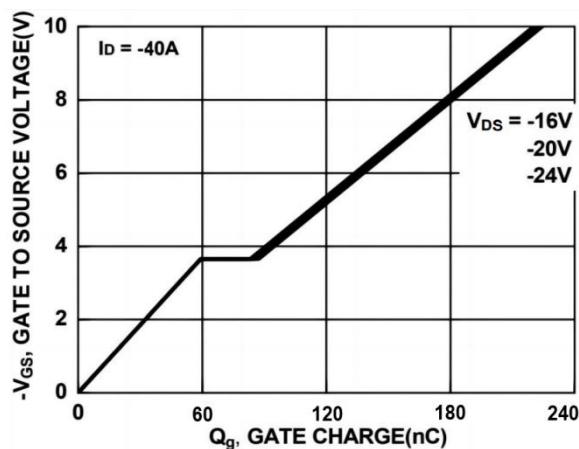


Fig6. Gate Charge vs. Gate to Source Voltage

Typical Characteristics

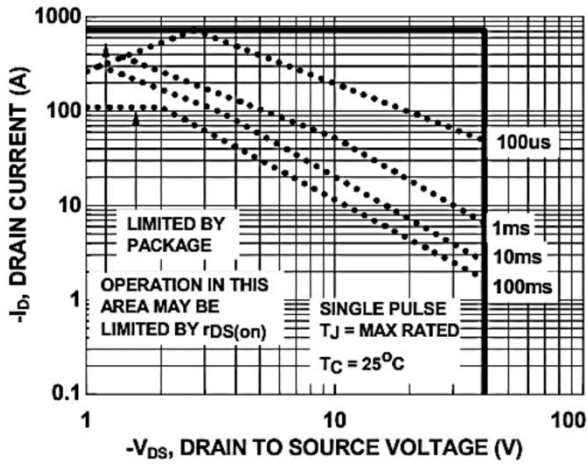


Fig7. Forward Bias Safe Operating Area

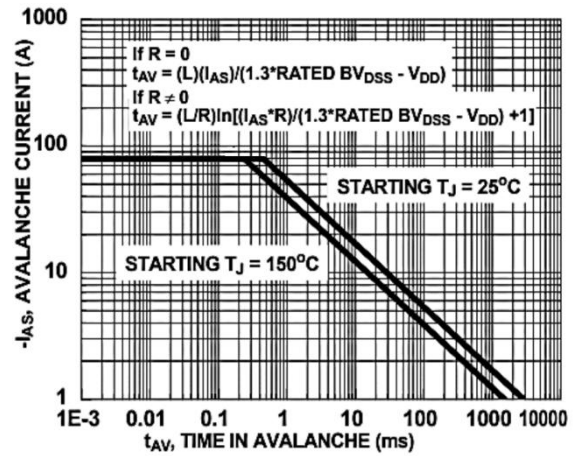


Fig8. Unclamped Inductive Switching Capability

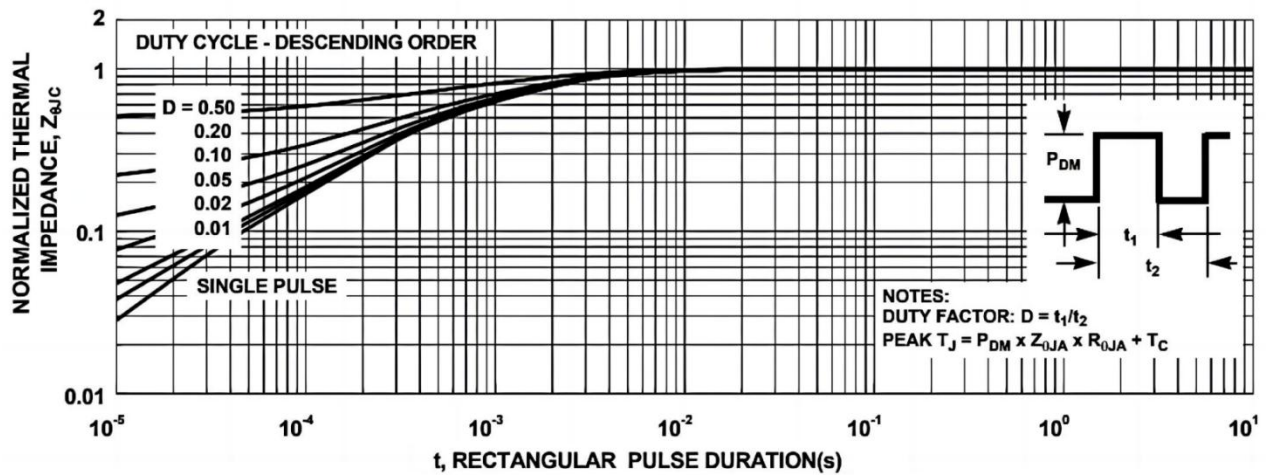


Fig9. Normalized Maximum Transient Thermal Impedance

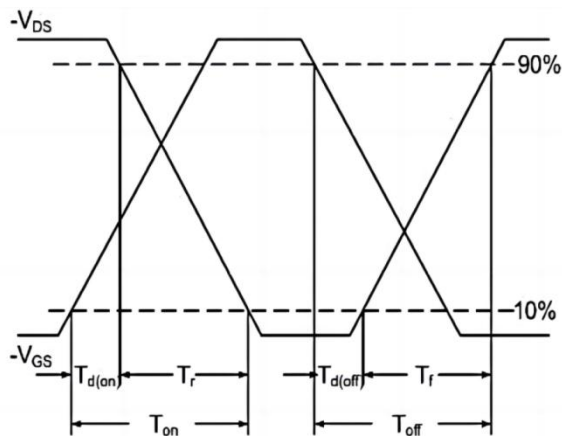


Fig10. Switching Time Waveform

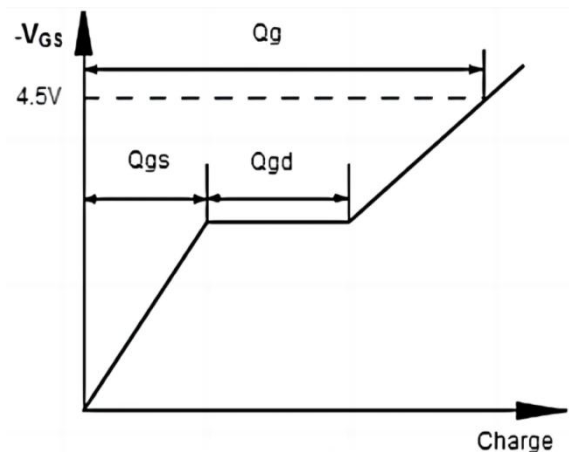
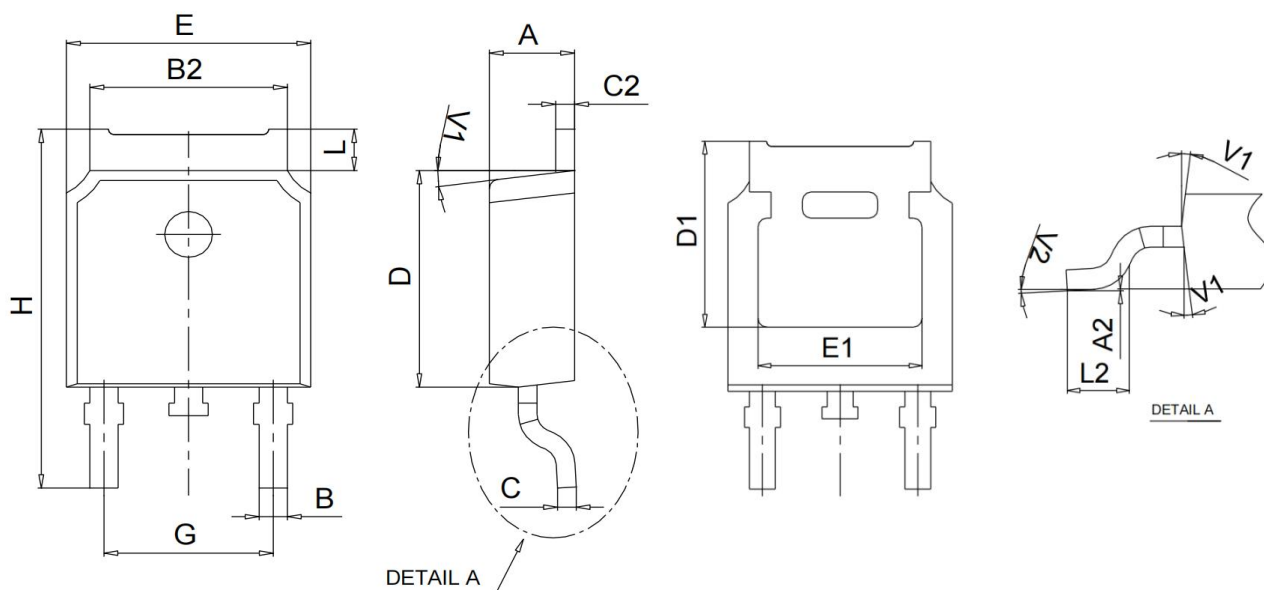


Fig11. Gate Charge Waveform

TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.100	2.500	0.083	0.098
A2	0.000	0.100	0.000	0.004
B	0.660	0.860	0.026	0.034
B2	5.180	5.480	0.202	0.216
C	0.400	0.600	0.016	0.024
C2	0.440	0.580	0.017	0.023
D	5.900	6.300	0.232	0.248
D1	5.300 REF.		0.209 REF.	
E	6.400	6.800	0.252	0.268
E1	4.630	-	0.182	-
G	4.470	4.670	0.176	0.184
H	9.500	10.700	0.374	0.421
L	1.090	1.210	0.043	0.048
L2	1.350	1.650	0.053	0.065
V1	7° BSC.		7° BSC.	
V2	0°	6°	0°	8°