

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	18mΩ@-10V	-40A
	25mΩ@-4.5V	

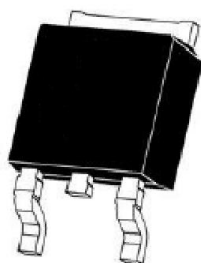
Feature

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

Application

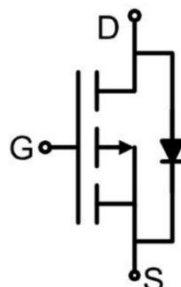
- Battery protection
- Load switch
- Uninterruptible power supply

Package

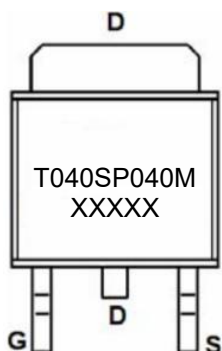


TO-252AB

Circuit diagram



Marking



Absolute maximum ratings (T_c=25°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} =-10V)	I _D	-40	A
Continuous Drain Current ¹⁾ (V _{GS} =-10V, T _c =100°C)	I _D (100°C)	-23	A
Pulsed Drain Current ²⁾	I _{DM}	-120	A
Power Dissipation ³⁾	P _D	25	W
Single Pulse Avalanche Energy ⁴⁾	E _{AS}	125	mJ
Thermal Resistance from Junction to Case ¹⁾	R _{θJC}	5	°C/W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_J=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	-40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-40V, V _{GS} =0V			-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	-1.6	-2.5	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =-10V, I _D =-30A		15	18	mΩ
		V _{GS} =-4.5V, I _D =-20A		18	25	
Dynamic characteristics ⁶⁾						
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, f =1MHz		2760		pF
Output Capacitance	C _{oss}			260		
Reverse Transfer Capacitance	C _{rss}			85		
Total Gate Charge	Q _g	V _{DS} =-20V, V _{GS} =-4.5V I _D =-12A		25		nC
Gate-Source Charge	Q _{gs}			11		
Gate-Drain Charge	Q _{gd}			9.5		
Turn-on delay time	t _{d(on)}	V _{DS} =-15V, V _{GS} =-10V I _D =-1A, R _G =6Ω, R _L =15Ω		48		nS
Turn-on rise time	t _r			24		
Turn-off delay time	t _{d(off)}			88		
Turn-off fall time	t _f			9.6		
Source-Drain Diode characteristics						
Diode Forward Current ^{1,5)}	I _S	V _D =V _G =0V , Force Current			-40	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =-1A			-1.3	V

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2) The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.
- 3) The power dissipation is limited by 150°C junction temperature.
- 4) The EAS data shows Max. rating. The test condition is V_{DS}=-32V, V_{GS}=-10V, L=0.1mH, I_{AS}=-30A.
- 5) The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.
- 6) Guaranteed by design, not subject to production testing.

Typical Characteristics

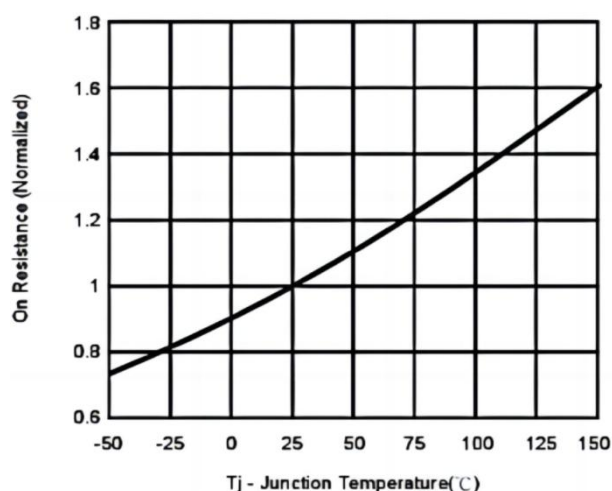


Fig.1 On Resistance Vs Junction Temperature

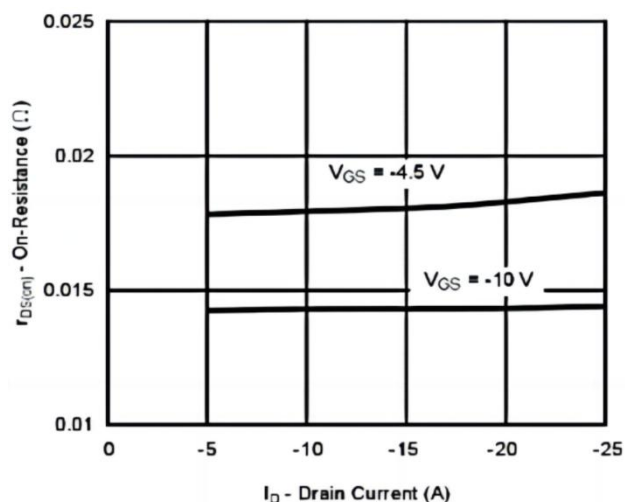


Fig.2 On-Resistance Vs. Drain Current

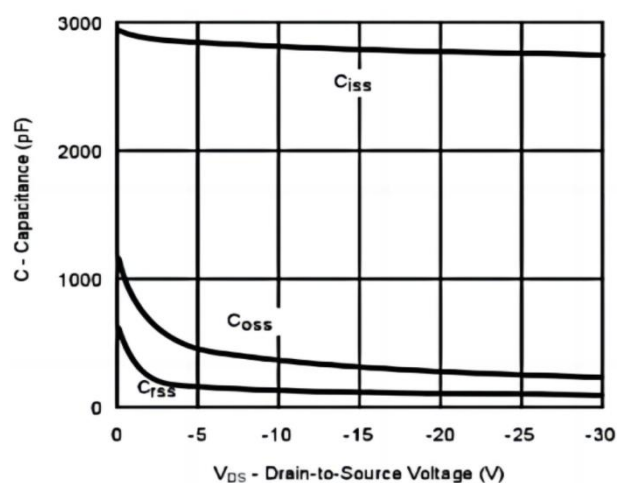


Fig.3 Capacitance

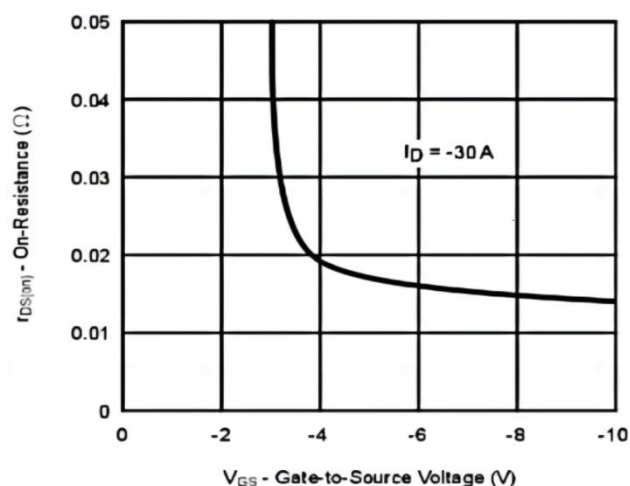


Fig.4 On-Resistance Vs. Gate-to-Source Voltage

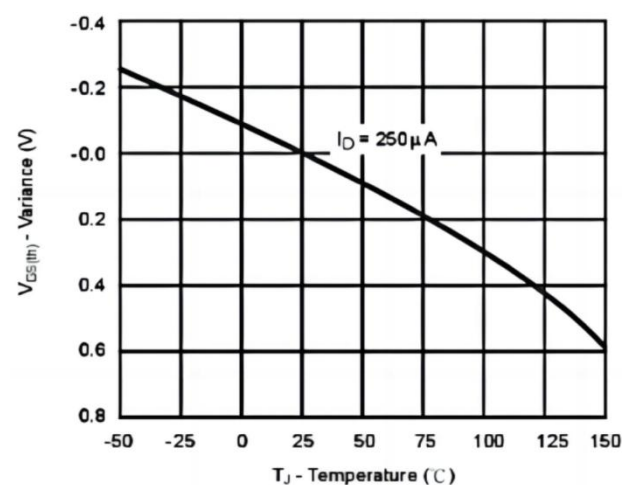


Fig.5 Threshold Voltage

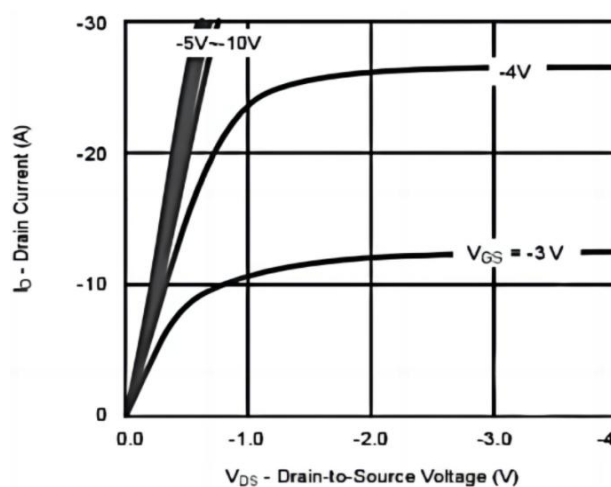


Fig.6 On-Region Characteristics

Typical Characteristics

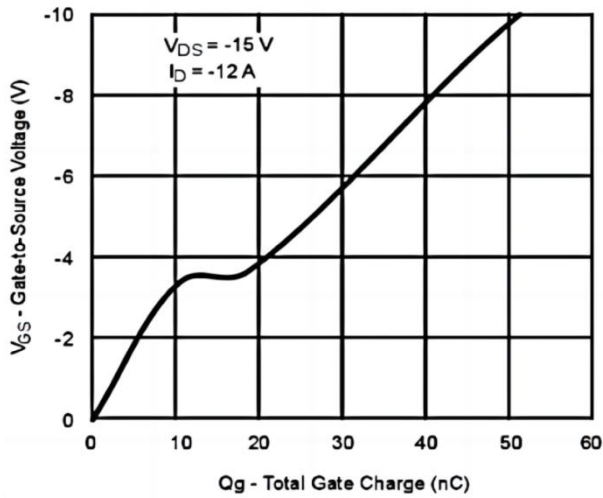


Fig.7 Gate Charge

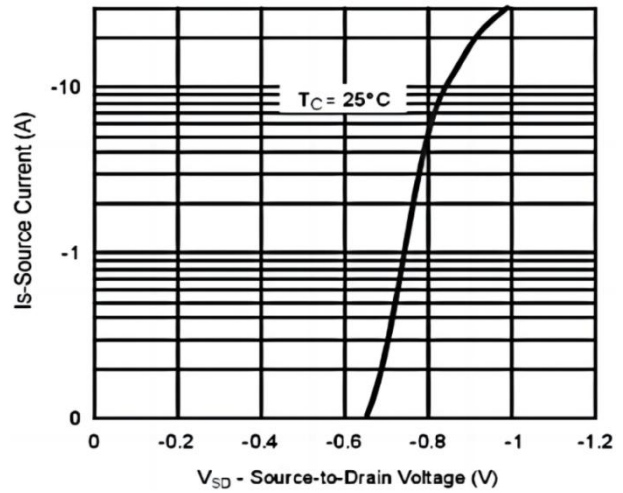


Fig.8 Body-diode Characteristic

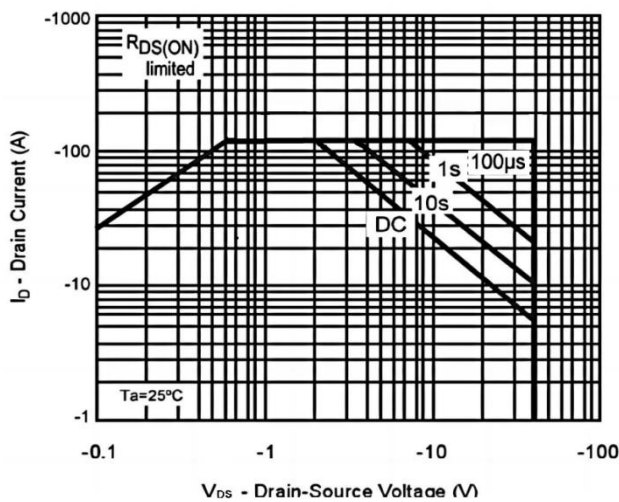


Fig.9 Safe Operating Area

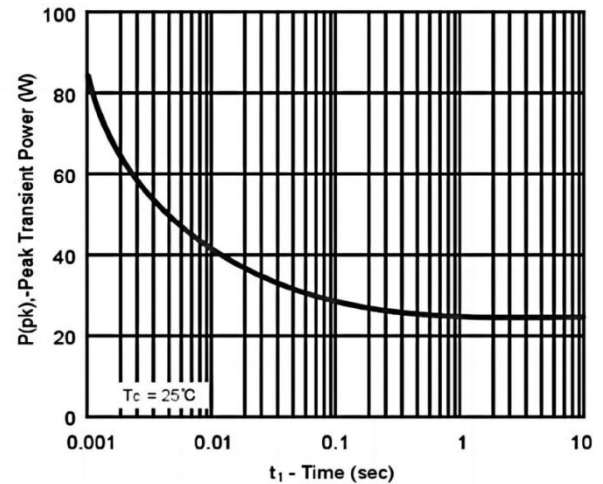


Fig.10 Single Pulse Maximum Power Dissipation

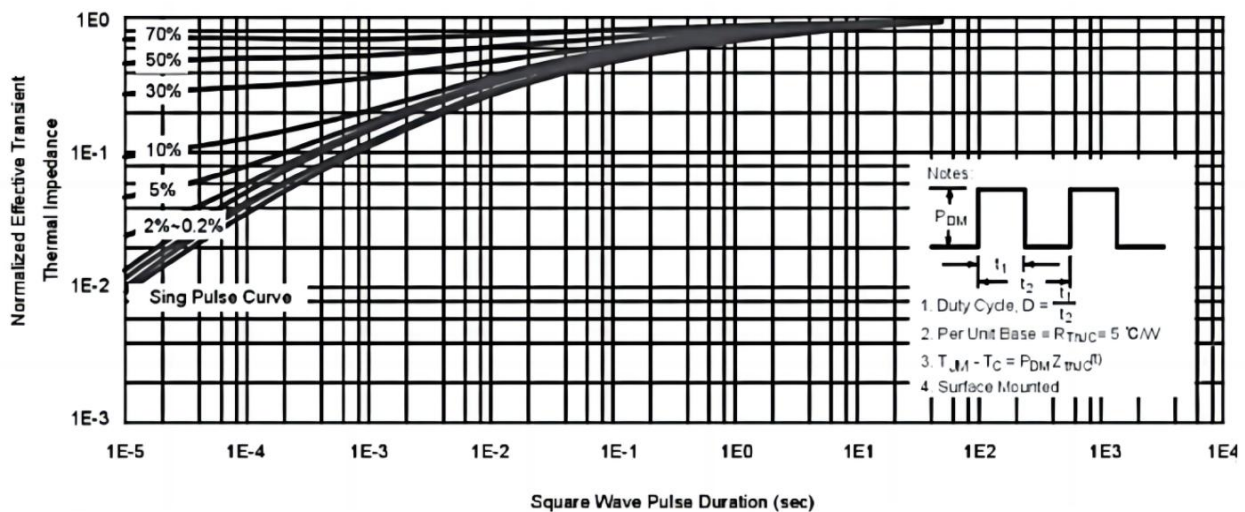
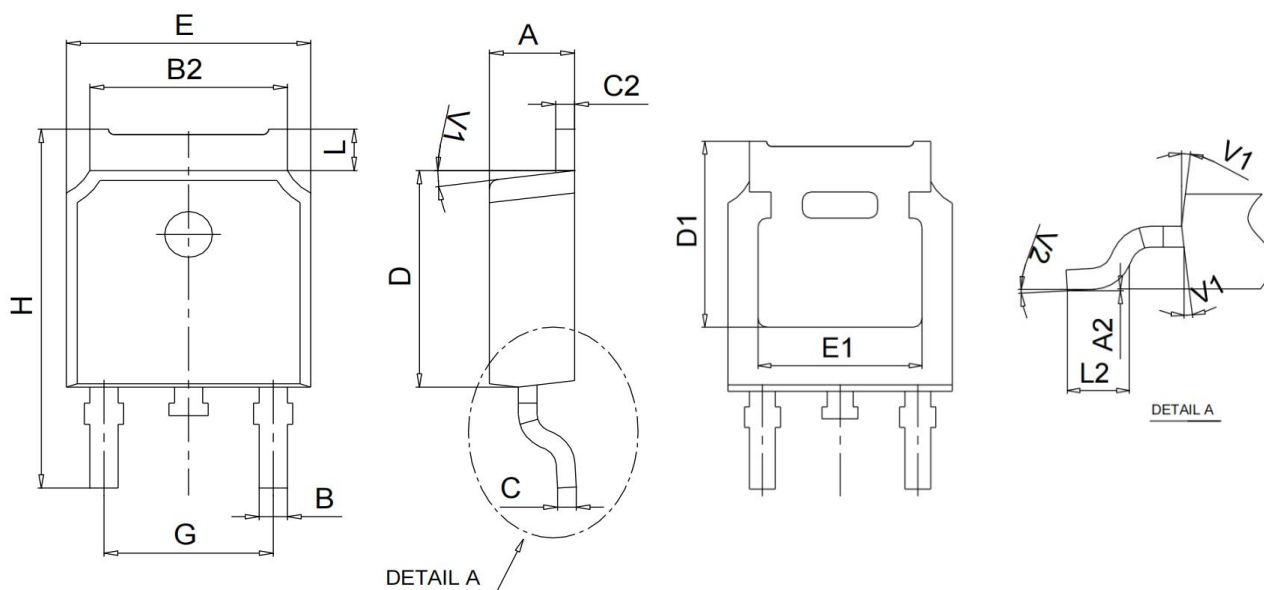


Fig.11 Normalized Maximum Transient Thermal Impedance

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°