

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	3.8mΩ@10V	100A

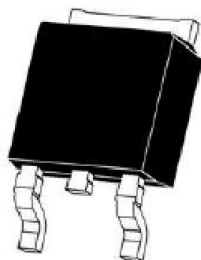
Feature

- Super low gate charge
- 100% EAS guaranteed
- Excellent Cdv/dt effect decline
- Advanced high cell density trench technology
- Suffix "-Q1" for AEC-Q101

Application

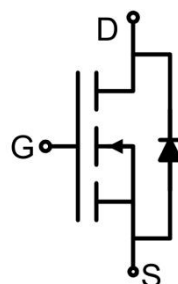
- Battery protection
- Uninterruptible power supply (UPS)

Package

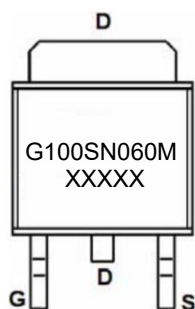


TO-252AB

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 ($T_C=25^{\circ}\text{C}$, Silicon Limited)	I_D	148	A
Continuous Drain Current ($T_C=25^{\circ}\text{C}$, Package Limited)	I_D	100	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	93	A
Pulsed Drain Current ($t_p=10\mu\text{s}$, $T_C=25^{\circ}\text{C}$)	I_{DM}	400	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	140	mJ
Maximum Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	150	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.83	$^{\circ}\text{C/W}$
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	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =48V, 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	2	2.6	4	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =60A		2.8	3.8	mΩ
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V f =100KHz		4603		pF
Output Capacitance	C _{oss}			1359		
Reverse Transfer Capacitance	C _{rss}			55		
Total Gate Charge	Q _g	V _{DS} =48V, V _{GS} =10V, I _D =45A		60		nC
Gate-Source Charge	Q _{gs}			16.8		
Gate-Drain Charge	Q _{gd}			6.7		
Turn-on delay time	t _{d(on)}	V _{DS} =30V, V _{GS} =10V, R _G =3Ω I _D =100A		14		nS
Turn-on rise time	t _r			96		
Turn-off delay time	t _{d(off)}			40		
Turn-off fall time	t _f			115		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				100	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =1A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =30A, V _{GS} =0V		53		nS
Reverse Recovery Charge	Q _{rr}	di/dt =-100A/μs		75		nC

Notes:

- 1) EAS condition: $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $L=0.5\text{mH}$.
- 2) Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- 3) Guaranteed by design, not subject to production.

Typical Characteristics

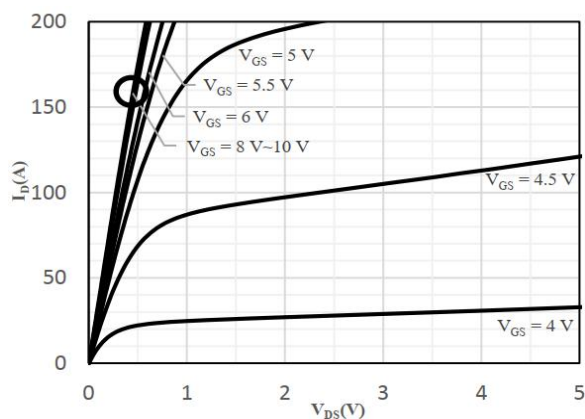


Fig 1 Typical Output Characteristics

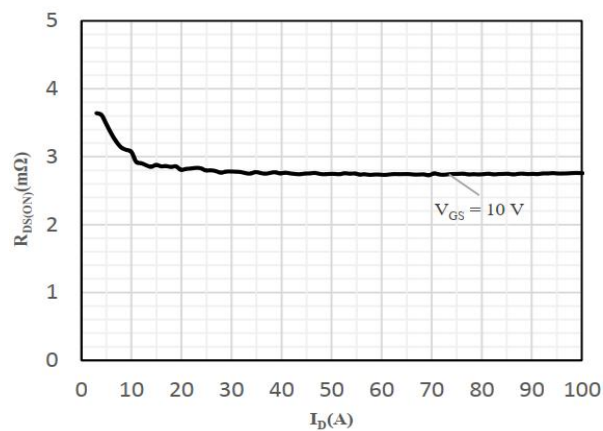


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

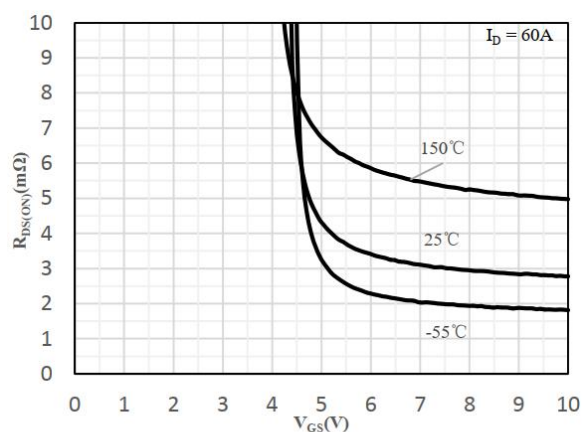


Fig 3 On-Resistance vs. Gate-Source Voltage

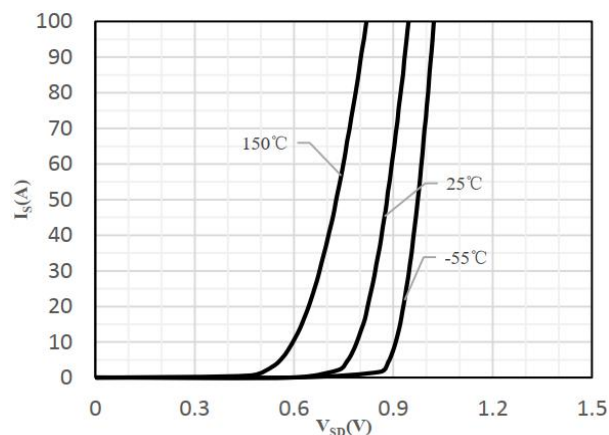


Fig 4 Body-Diode Characteristics

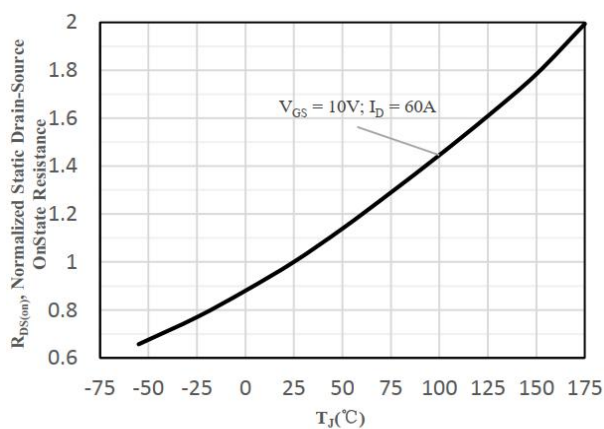


Fig 5 Normalized On-Resistance vs. Junction Temperature

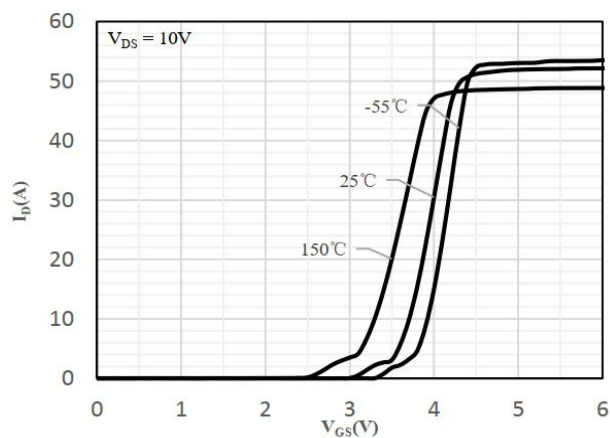


Fig 6 Transfer Characteristics

Typical Characteristics

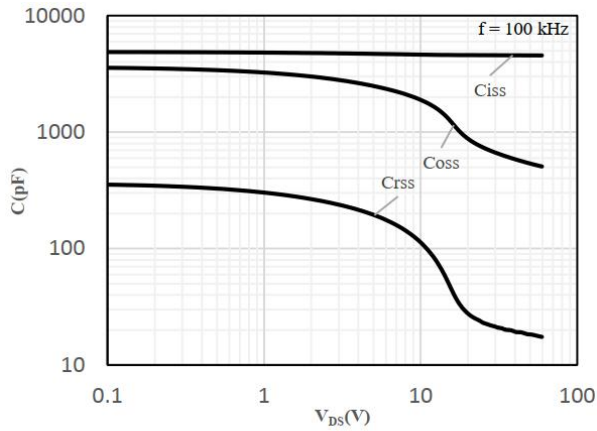


Fig 7 Capacitance Characteristics

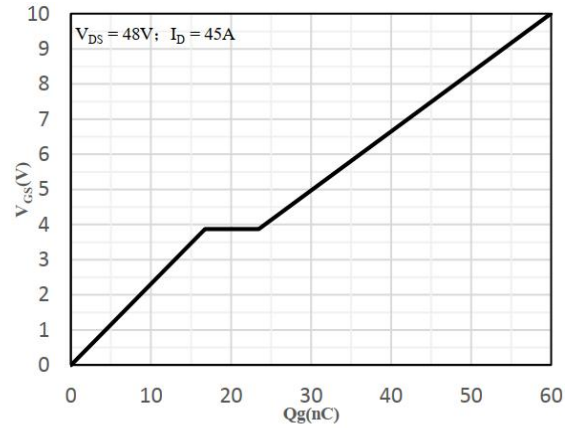


Fig 8 Gate-Charge Characteristics

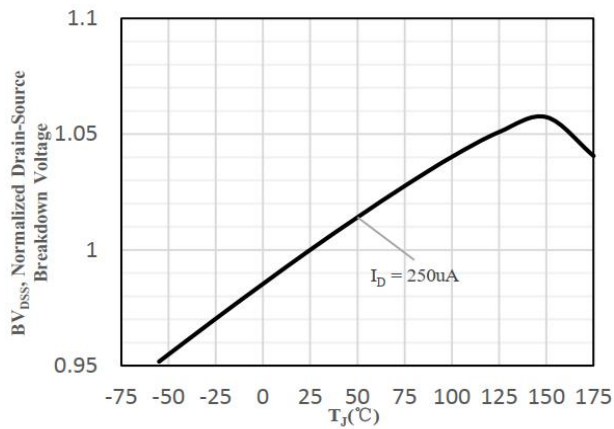


Fig 9 Normalized Breakdown Voltage

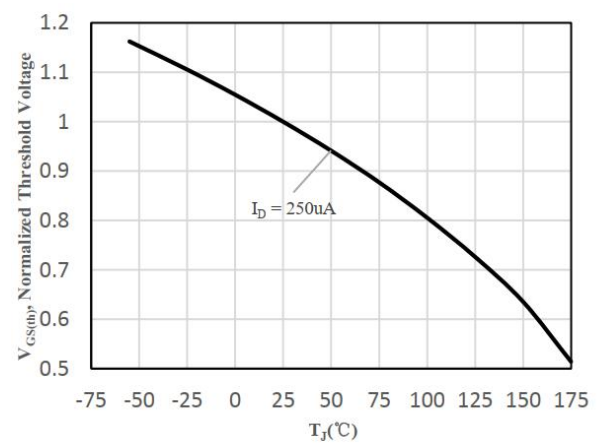


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

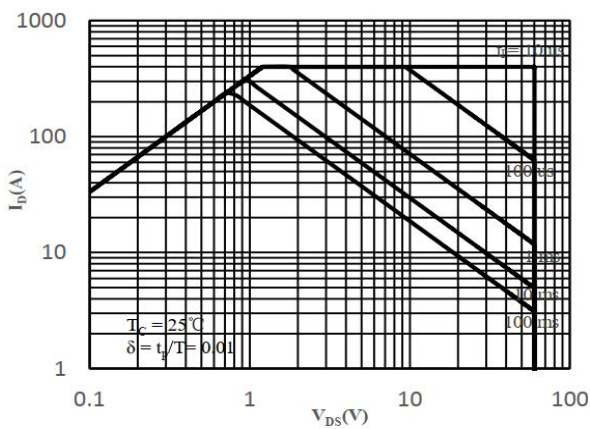


Fig 11 Safe Operation Area

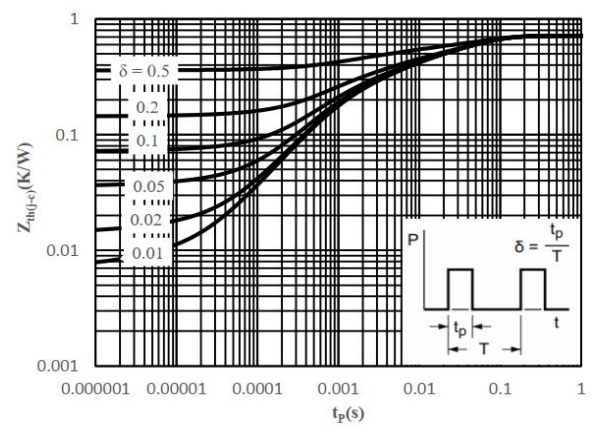
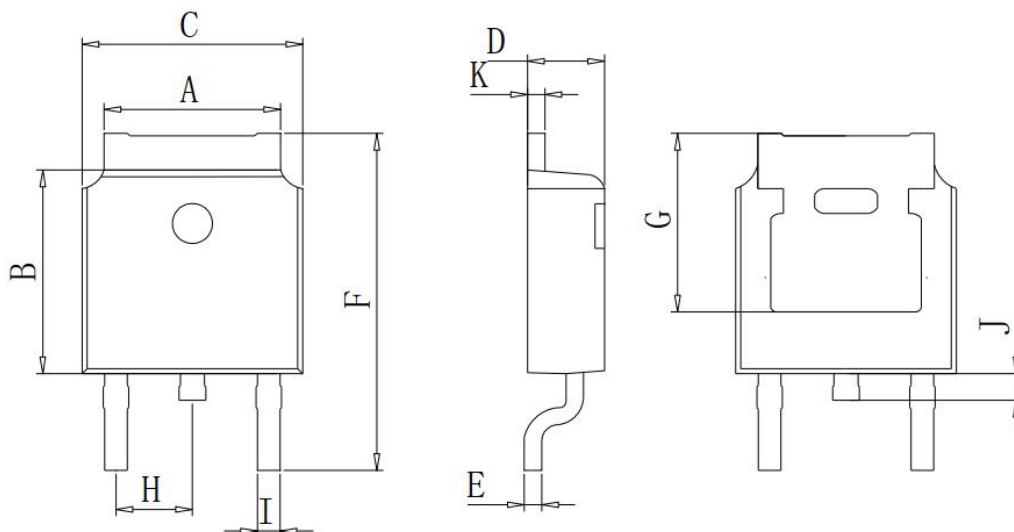


Fig 12 Maximum transient thermal impedance

TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	5.050	5.650	0.199	0.222
B	5.800	6.400	0.228	0.252
C	6.250	6.850	0.246	0.270
D	2.200	2.400	0.087	0.094
E	0.400	0.600	0.016	0.024
F	9.710	10.310	0.382	0.406
G	5.050	5.650	0.199	0.222
H	2.100	2.500	0.083	0.098
I	0.700	0.900	0.028	0.035
J	0.500	0.700	0.020	0.028
K	0.400	0.600	0.016	0.024