

Description

The GT1003B uses advanced trench technology and design to provide excellent $R_{DS(ON)}$, low gate charge. This device is suitable for use in high frequency Synchronous-recification application.

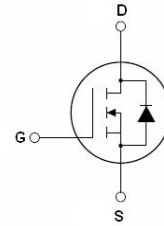
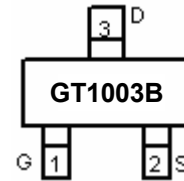
General Features

V_{DS}	$R_{DS(ON)}$ @ 10V (Typ)	I_D
100V	115m Ω	7 A

- High density cell design for ultra low $R_{DS(ON)}$
- Lead free product is acquired
- Excellent package for good heat dissipation
- RoHS Compliant

Application

- Consumer electronic power supply
- Isolated DC/DC converter
- Motor control

**Schematic Diagram****Marking and Pin Assignment****SOT-23****Ordering Information**

Part Number	Marking	Case	Packaging
GT1003B	GT1003B	SOT-23	3000pcs/Reel

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	7	A
Drain Current-Pulsed (Note 1)	I_{DM}	21	A
Maximum Power Dissipation	P_D	17	W
Single pulsed avalanche energy (Note 5)	E_{AS}	1.2	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

Thermal Characteristic

Thermal Resistance, Junction-to-case	$R_{\theta JC}$	7.4	°C/W
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	62	°C/W

Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	110	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA

Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA	1	1.95	3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =3.5A	-	115	140	mΩ
Dynamic Characteristics (Note4)						
Input Capacitance	C _{ISS}	V _{DS} =50V,V _{GS} =0V, F=1.0MHz	-	206	-	PF
Output Capacitance	C _{OSS}		-	28.9	-	PF
Reverse Transfer Capacitance	C _{RSS}		-	1.4	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =50V,I _D =5A V _{GS} =10V,R _{GEN} =2Ω	-	14.7	-	ns
Turn-on Rise Time	t _r		-	3.5	-	ns
Turn-Off Delay Time	t _{d(off)}		-	20.9	-	ns
Turn-Off Fall Time	t _f		-	2.7	-	ns
Total Gate Charge	Q _g	V _{DS} =50V,I _D =5A, V _{GS} =10V	-	4.3	-	nC
Gate-Source Charge	Q _{gs}		-	1.5	-	nC
Gate-Drain Charge	Q _{gd}		-	1.1	-	nC
Gate plateau voltage	V _{plateau}			5.0		V
Drain-Source Diode Characteristics						
Diode Forward Current (Note 2)	I _S	V _{GS} <V _{th}	-	-	7	A
Pulsed Source Current	I _{SP}	V _{GS} <V _{th}			21	
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V,I _S =7A	-	-	1.2	V
Reverse Recovery Time	t _{rr}	I _F =5A, di _F /dt = 100A/ μ s		32.1		nS
Reverse Recovery Charge	Q _{rr}			39.4		μC
Peak Reverse Recovery Current	I _{rrm}		-	2.1	-	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. $V_{DD}=50V$, $R_G=50\Omega$, $L=0.3mH$, starting $T_j=25^\circ C$.

Typical Electrical And Thermal Characteristics

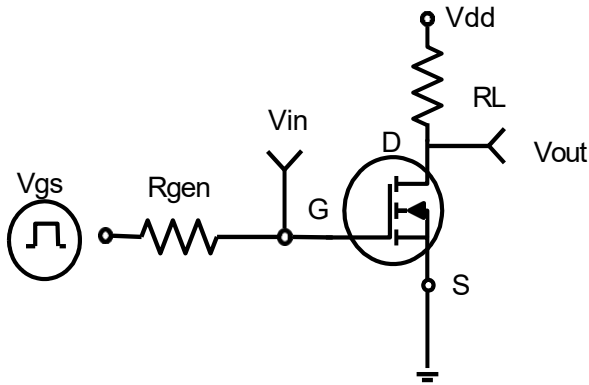


Figure 1. Switching Test Circuit

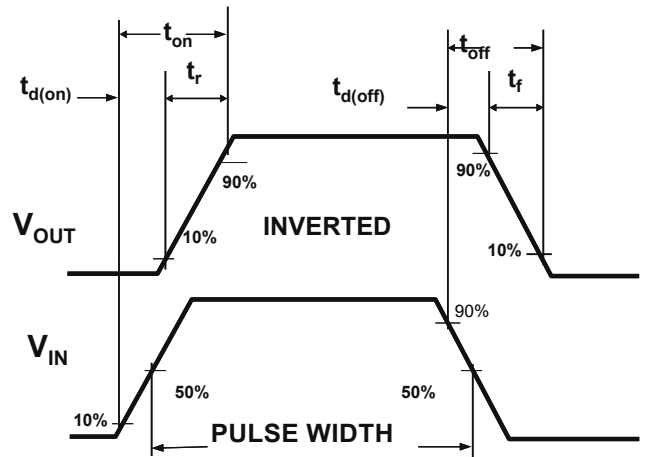


Figure 2. Switching Waveforms

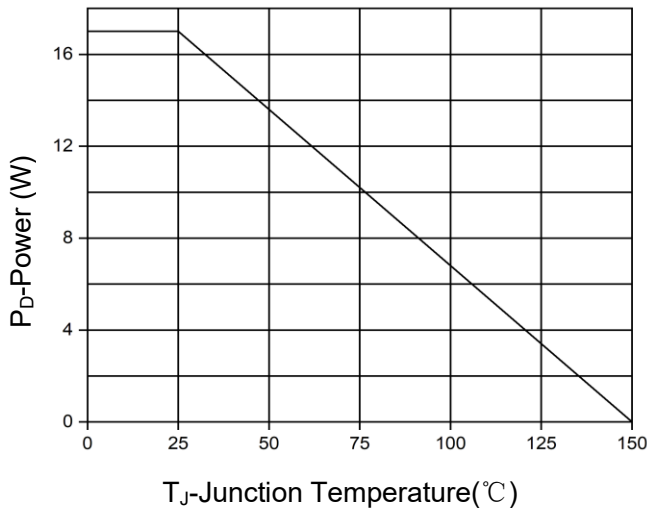


Figure 3. Power Dissipation

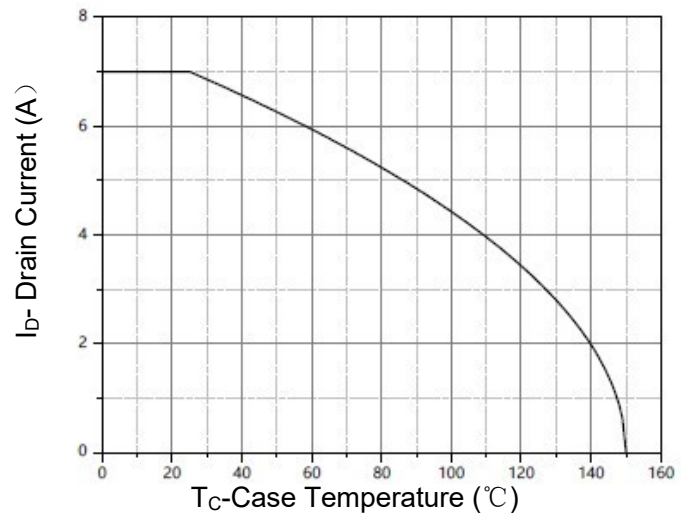


Figure 4. Drain Current

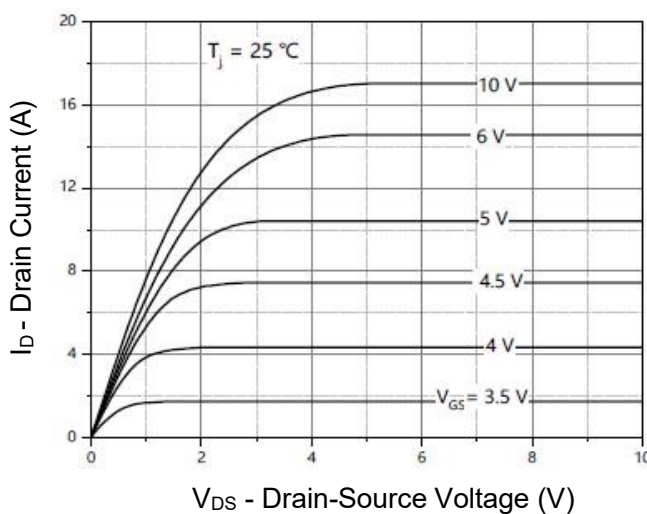


Figure 5. Output characteristics

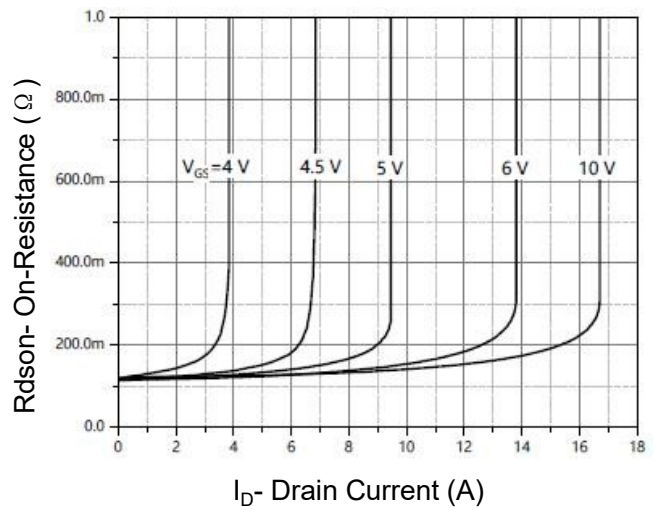


Figure 6. Drain-Source On-state resistance

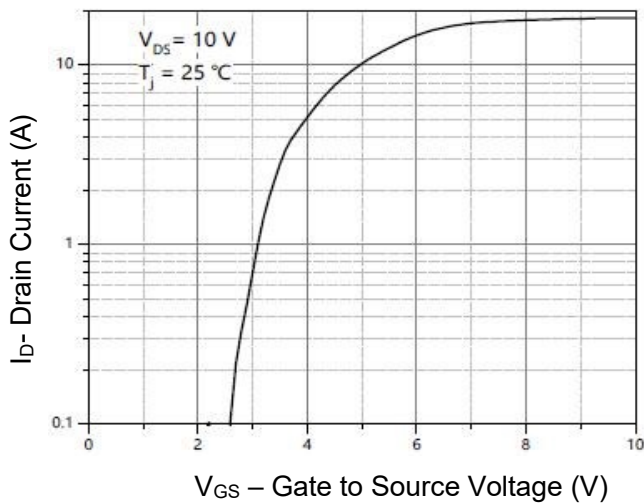


Figure 7. Transfer Characteristics

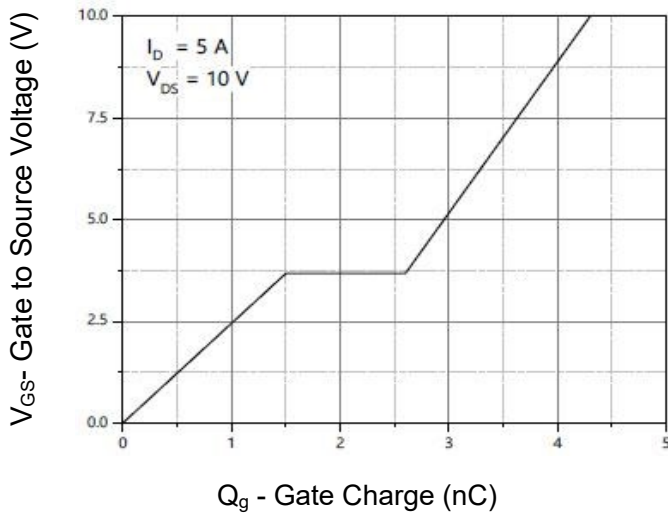


Figure 9. Gate Charge

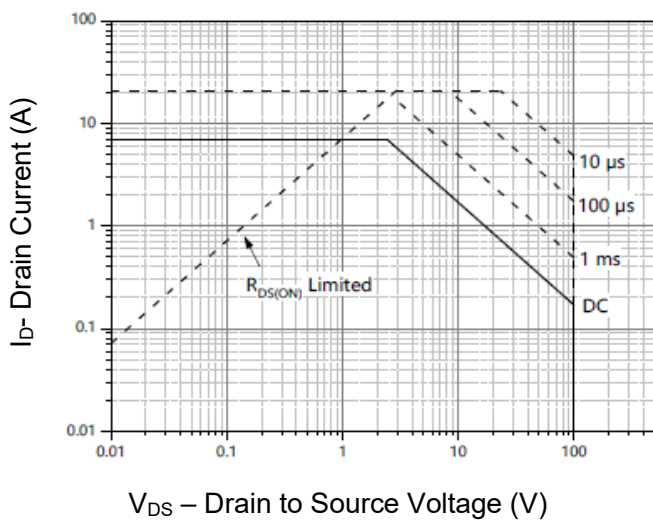


Figure 11. Safe Operation Area

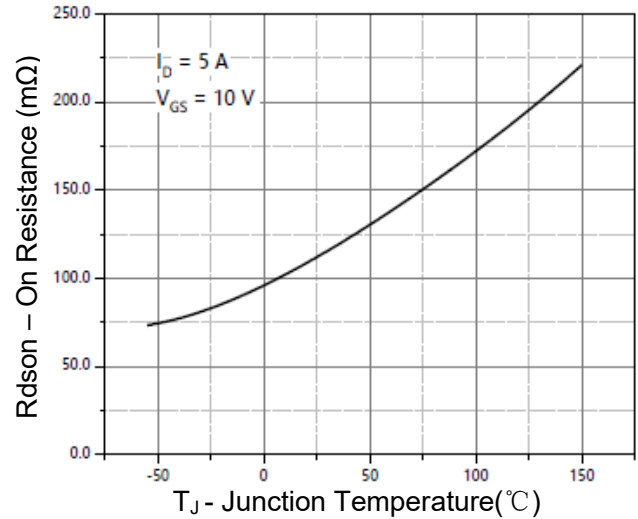


Figure 8. Drain-Source On-State Resistance

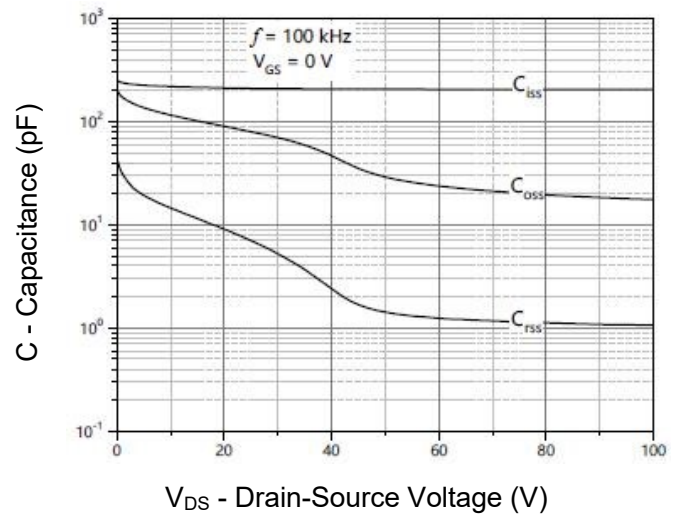


Figure 10. Capacitance vs Vds

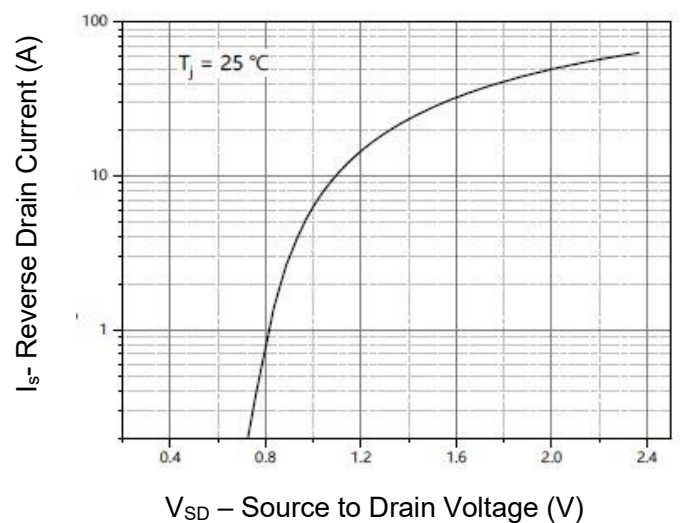


Figure 12. Source- Drain Diode Forward

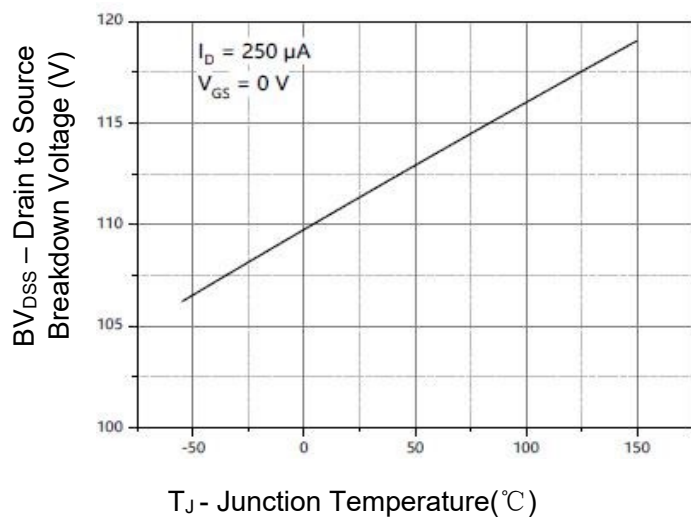
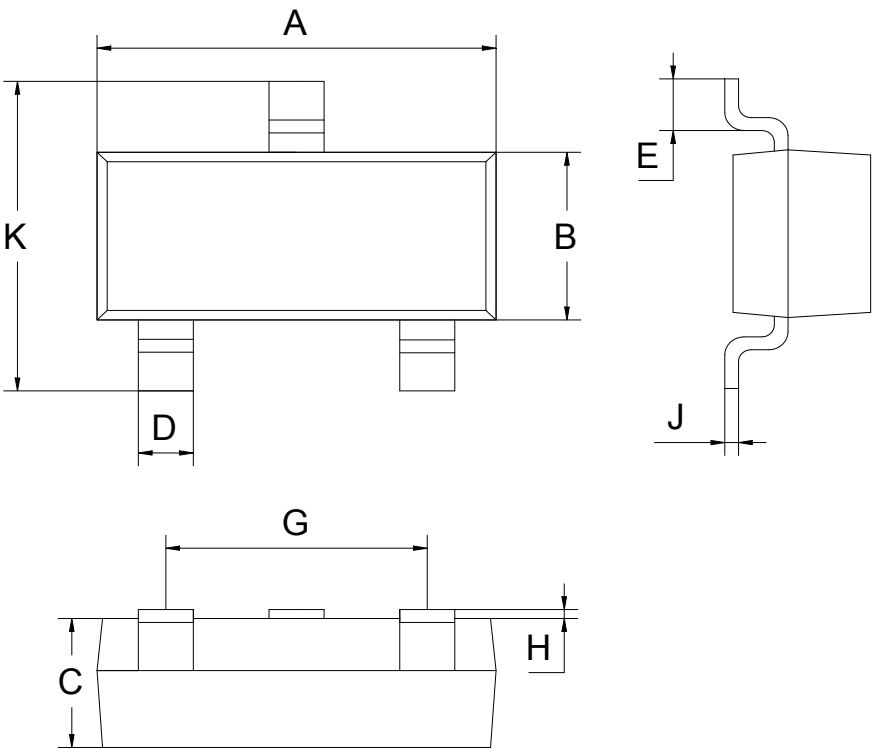


Figure 13. Drain-source breakdown voltage

SOT-23 Package Information



SOT-23			
Dim	MIN	NOM	MAX
A	2.80	2.90	3.00
B	1.20	1.30	1.40
C	0.90	1.00	1.10
D	0.39	0.40	0.45
E	0.20MIN		
G	1.90REF		
H	0.00	-	0.10
J	0.05	0.10	0.15
K	2.30	2.40	2.50
All Dimensions in mm			