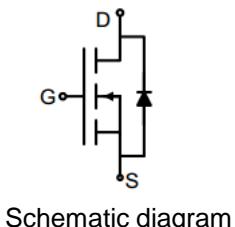


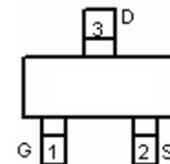
N-Channel Enhancement Mode Power MOSFET

Description

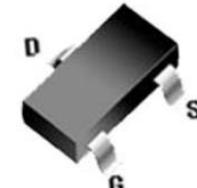
The GT1003D uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.



Schematic diagram



Marking and pin assignment



SOT-23-3L

General Features

- V_{DS} 100V
- I_D (at $V_{GS} = 10V$) 3A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 130mΩ
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 150mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters
- Synchronous Rectification

Device	Package	Marking	Packaging
GT1003D	SOT-23-3L	GT1003D	3000pcs/Reel

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted			
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Continuous Drain Current	I_D	3	A
Pulsed Drain Current (note1)	I_{DM}	15	A
Gate-Source Voltage	V_{GS}	± 20	V
Single pulse avalanche energy (note3)	E_{AS}	3.2	mJ
Power Dissipation	P_D	2	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	°C

Thermal Resistance

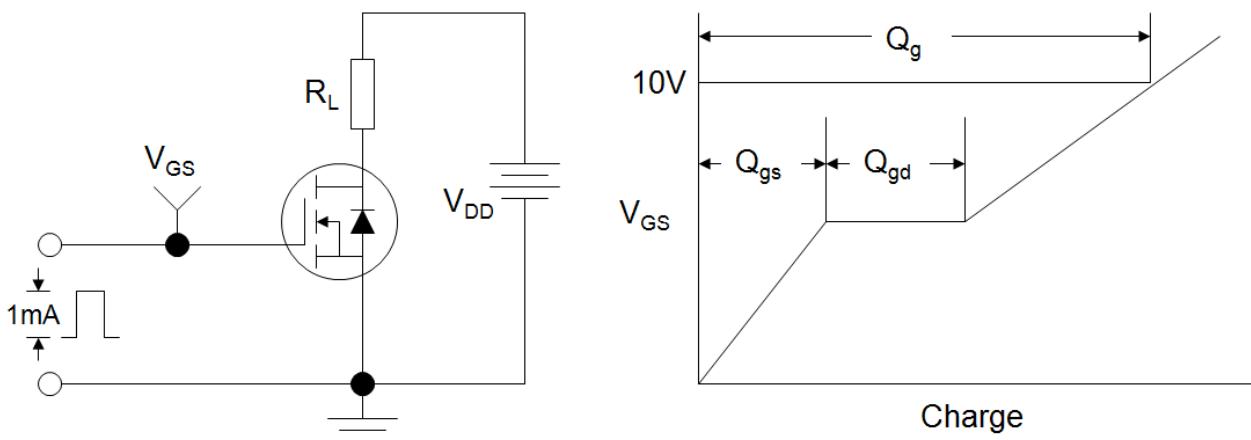
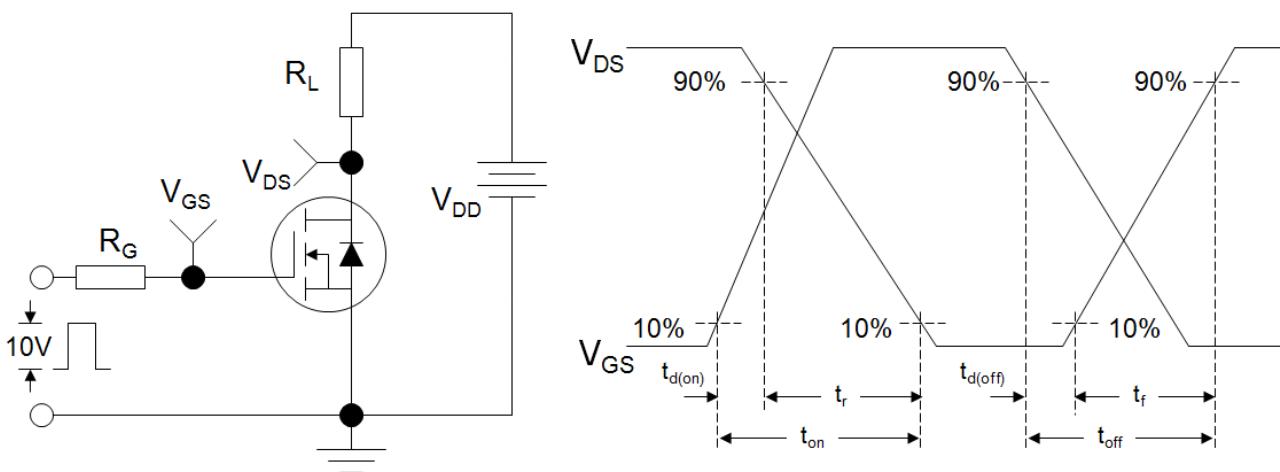
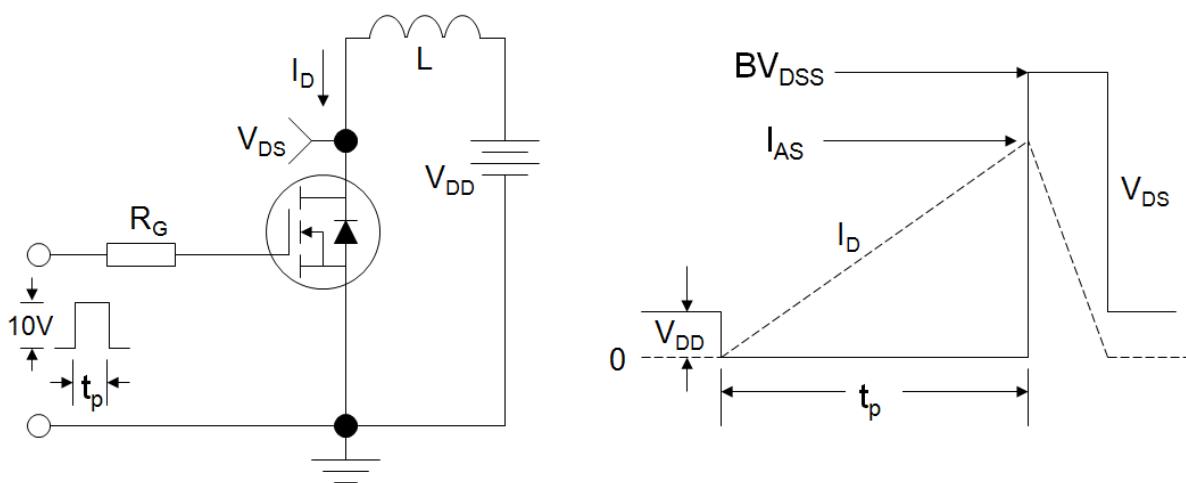
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	°C/W
Thermal Resistance, Junction-to-Case	R_{thJC}	7.2	°C/W

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{\text{DS}} = 80\text{V}, V_{\text{GS}} = 0\text{V}, T_J = 25^\circ\text{C}$	--	--	1	μA
Gate-Source Leakage	I_{GSS}	$V_{\text{GS}} = \pm 20\text{V}$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_D = 250\mu\text{A}$	1.2	1.8	2.6	V
Drain-Source On-Resistance	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 10\text{V}, I_D = 3\text{A}$	--	105	130	$\text{m}\Omega$
		$V_{\text{GS}} = 4.5\text{V}, I_D = 2\text{A}$	--	135	150	
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 50\text{V}, f = 1.0\text{MHz}$	--	212	--	pF
Output Capacitance	C_{oss}		--	27.5	--	
Reverse Transfer Capacitance	C_{rss}		--	1.6	--	
Total Gate Charge	Q_g	$V_{\text{DD}} = 50\text{V}, I_D = 3\text{A}, V_{\text{GS}} = 10\text{V}$	--	5.2	--	nC
Gate-Source Charge	Q_{gs}		--	1.6	--	
Gate-Drain Charge	Q_{gd}		--	1.2	--	
Turn-on Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = 50\text{V}, I_D = 3\text{A}, R_G = 2\Omega$	--	16	--	ns
Turn-on Rise Time	t_r		--	3	--	
Turn-off Delay Time	$t_{\text{d}(\text{off})}$		--	19	--	
Turn-off Fall Time	t_f		--	2	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	3	A
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{\text{SD}} = 3\text{A}, V_{\text{GS}} = 0\text{V}$	--	--	1.2	V
Reverse Recovery Charge	Q_{rr}	$IF=3\text{A}, di/dt=100\text{A/us}$	--	27	--	nC
Reverse Recovery Time	Tr_{rr}		--	35	--	ns

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G
3. EAS condition : $T_J=25^\circ\text{C}$, $V_{\text{DD}}=50\text{V}$, $V_{\text{GS}}=10\text{V}$, $L=0.5\text{mH}$, $R_g=25\Omega$

Gate Charge Test Circuit

EAS Test Circuit

Switch Time Test Circuit


Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

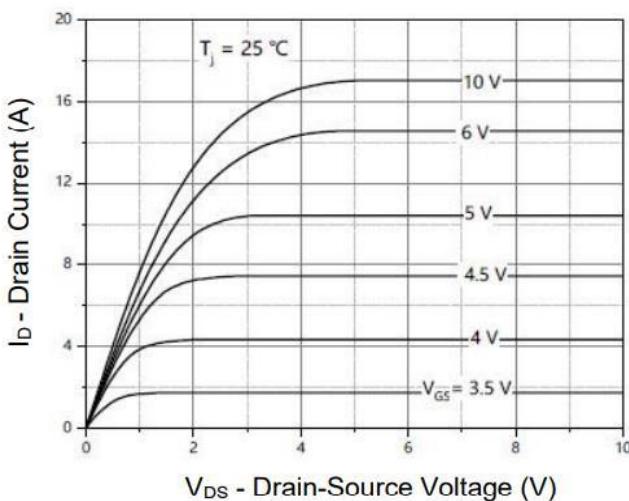


Figure1. Output Characteristics

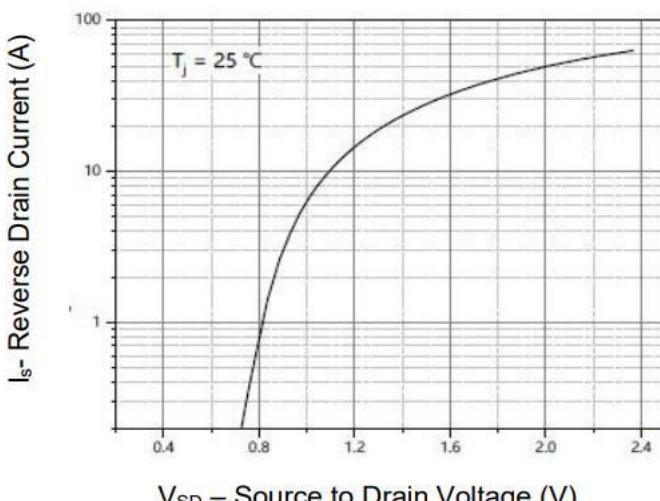


Figure2. Transfer Characteristics

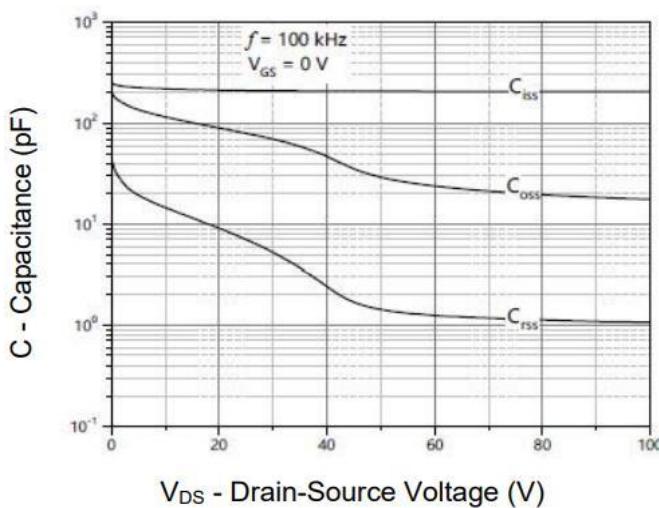


Figure3. Capacitance Characteristics

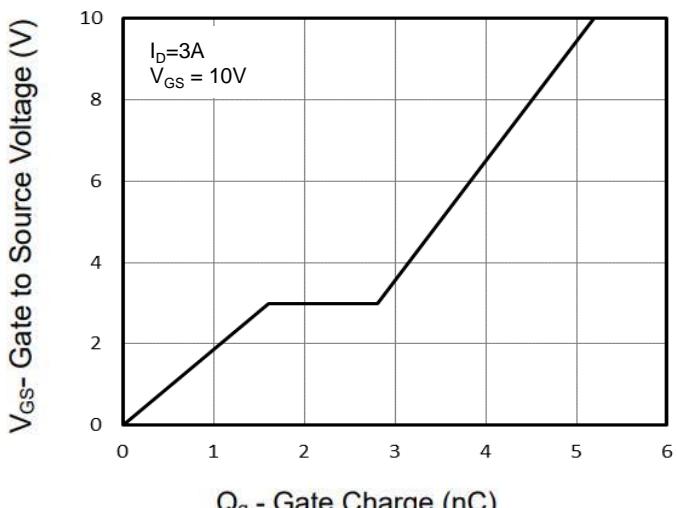


Figure4. Gate Charge

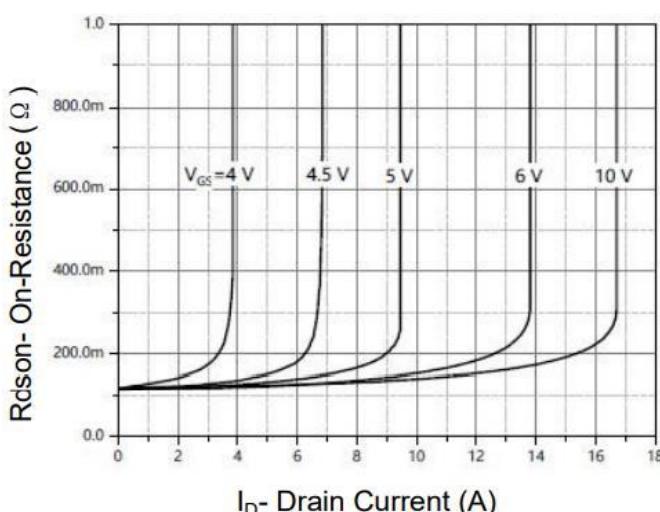


Figure5. Drain-Source on Resistance

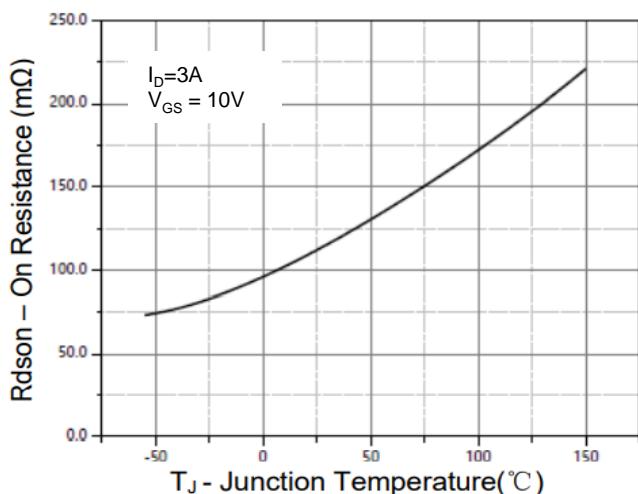
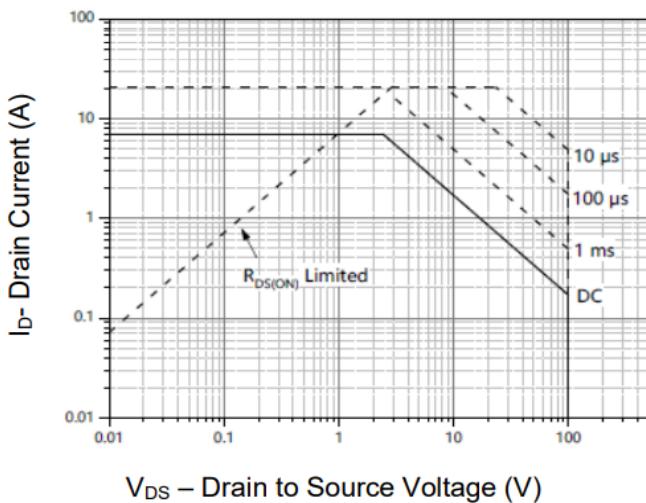


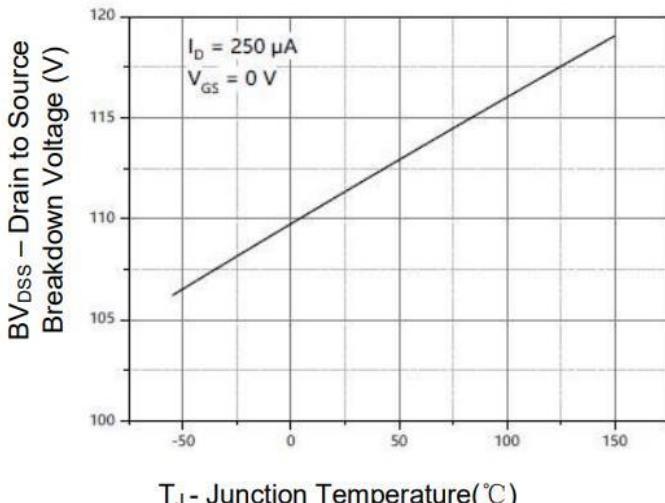
Figure6. Drain-Source on Resistance

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted



V_{DS} – Drain to Source Voltage (V)

Figure 7. Safe Operation Area



T_J - Junction Temperature ($^\circ\text{C}$)

Figure 8. Drain-source breakdown voltage

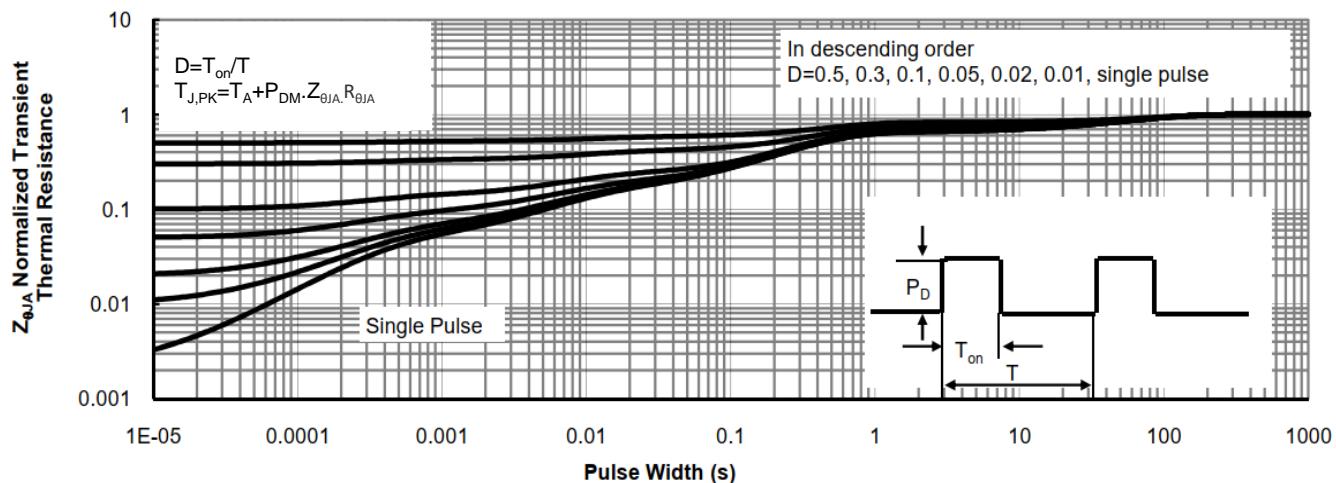
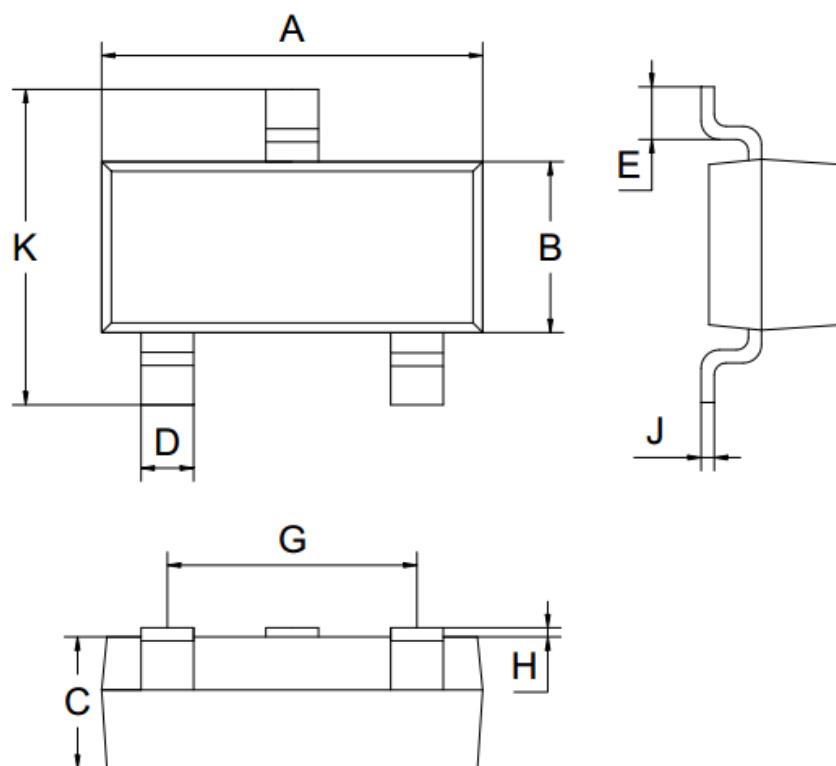


Figure 9. Transient thermal impedance

SOT-23-3L Package Information



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	2.80	2.90	3.00
B	1.50	1.60	1.70
C	1.00	1.10	1.20
D	0.30	0.40	0.50
E	0.25	0.40	0.55
G		1.90	
H	0.00	-	0.10
J	0.047	0.127	0.207
K	2.60	2.80	3.00
All Dimensions in mm			