

N-Channel Trench MOSFET

Description

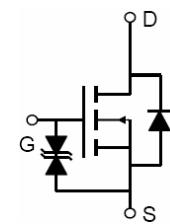
This Product uses advanced trench technology MOSFETs to provide excellent $R_{DS(ON)}$ and low gate charge. The complementary MOSFETs may be used to form a level shifted high side switch, and for a host of other applications.

General Features

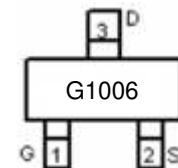
- V_{DS} 100V
- I_D (at $V_{GS} = 10V$) 3A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 150mΩ
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 180mΩ
- ESD Rating: 6000V HBM
- 100% Avalanche Tested
- RoHS Compliant

Application

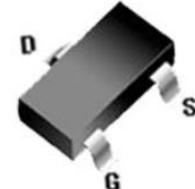
- Power switch
- DC/DC converters



Schematic diagram



Marking and pin assignment



SOT-23-3L

Device	Package	Marking	Packaging
G1006LE	SOT-23-3L	G1006	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}	12	A
Gate-Source Voltage	V_{GS}	± 20	V
Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	$^\circ\text{C}$

Thermal Resistance

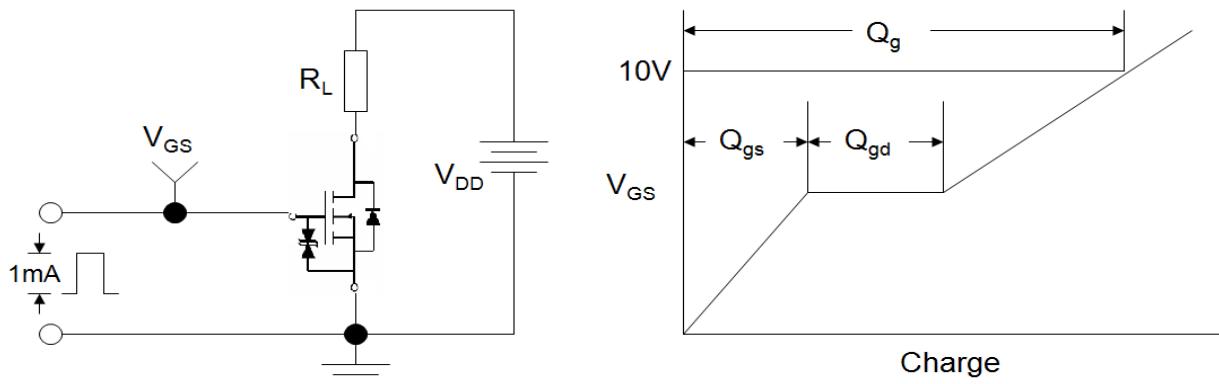
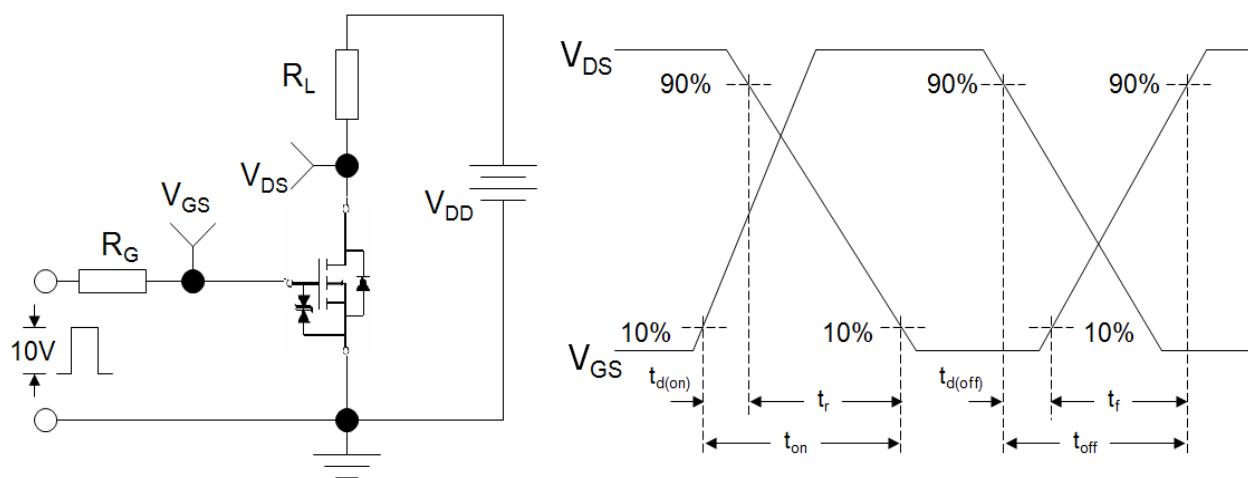
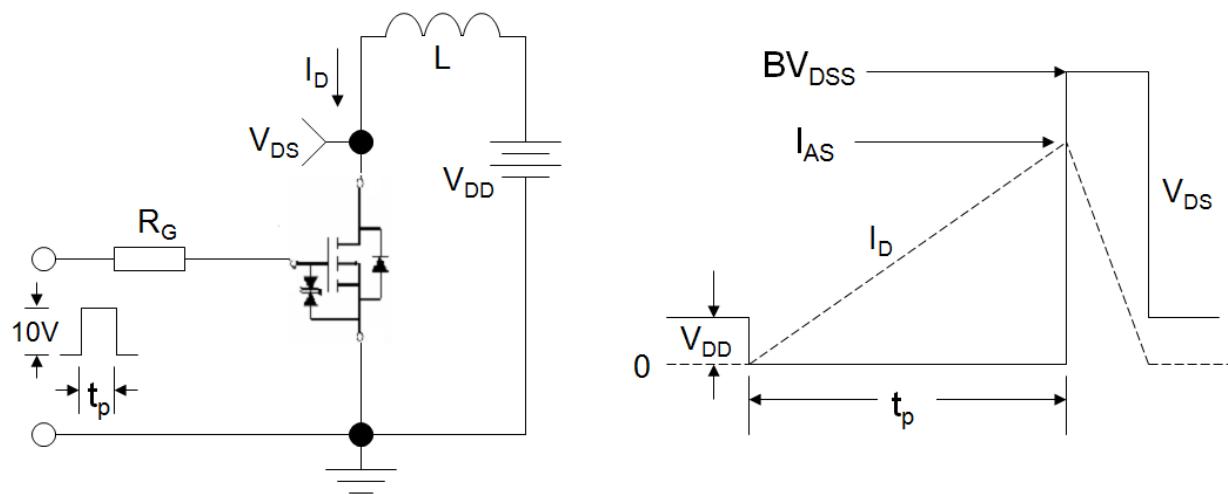
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	100	$^\circ\text{C/W}$

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}	$V_{\text{DS}} = 95\text{V}, V_{\text{GS}} = 0\text{V}$	--	--	1	μA
Gate-Source Leakage	I_{GSS}	$V_{\text{GS}} = \pm 20\text{V}$	--	--	± 50	μA
Gate-Source Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_D = 250\mu\text{A}$	1	1.7	2.2	V
Drain-Source On-Resistance	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 10\text{V}, I_D = 3\text{A}$	--	143	150	$\text{m}\Omega$
		$V_{\text{GS}} = 4.5\text{V}, I_D = 3\text{A}$	--	154	180	
Forward Transconductance	g_{FS}	$V_{\text{DS}}=5\text{V}, I_D=3\text{A}$	--	7.4	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 50\text{V}, f = 1.0\text{MHz}$	--	622	--	pF
Output Capacitance	C_{oss}		--	35	--	
Reverse Transfer Capacitance	C_{rss}		--	24	--	
Total Gate Charge	Q_g	$V_{\text{DD}} = 50\text{V}, I_D = 3\text{A}, V_{\text{GS}} = 10\text{V}$	--	18.2	--	nC
Gate-Source Charge	Q_{gs}		--	3.3	--	
Gate-Drain Charge	Q_{gd}		--	3.8	--	
Turn-on Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = 50\text{V}, I_D = 3\text{A}, R_G = 3\Omega$	--	6	--	nS
Turn-on Rise Time	t_r		--	4	--	
Turn-off Delay Time	$t_{\text{d}(\text{off})}$		--	20	--	
Turn-off Fall Time	t_f		--	4	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	6	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

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G

Gate Charge Test Circuit**Switch Time Test Circuit****EAS Test Circuit**

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

Figure 1. Output Characteristics

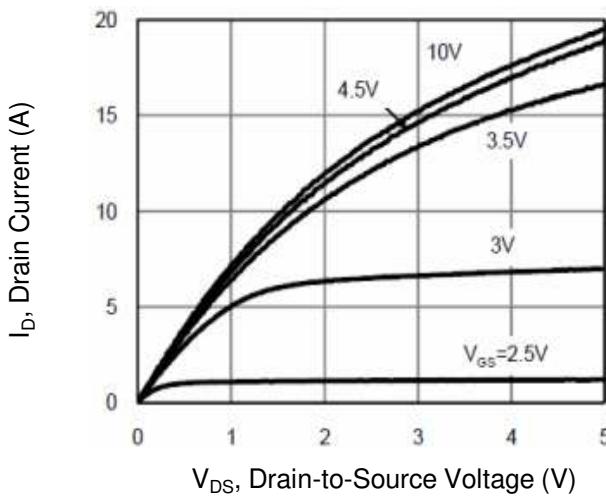


Figure 2. Transfer Characteristics

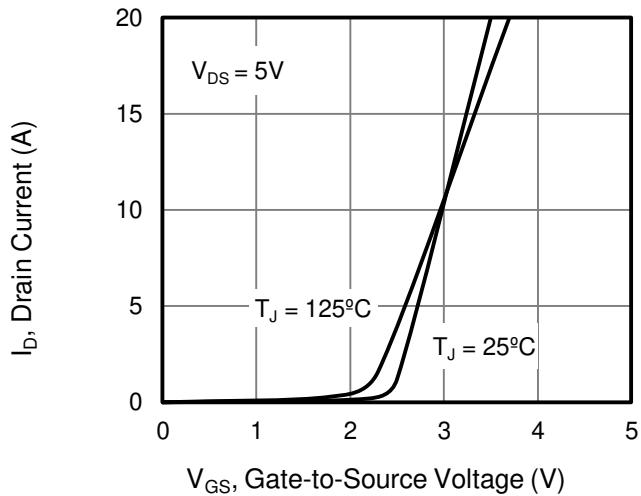


Figure 3. Drain Source On Resistance

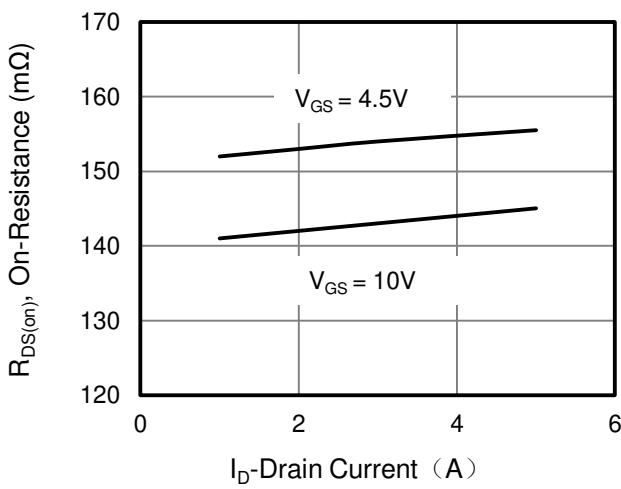


Figure 4. Gate Charge

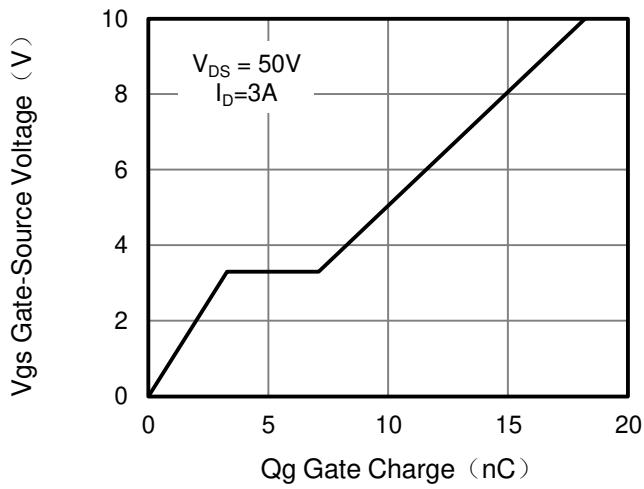


Figure 5. Capacitance vs Vds

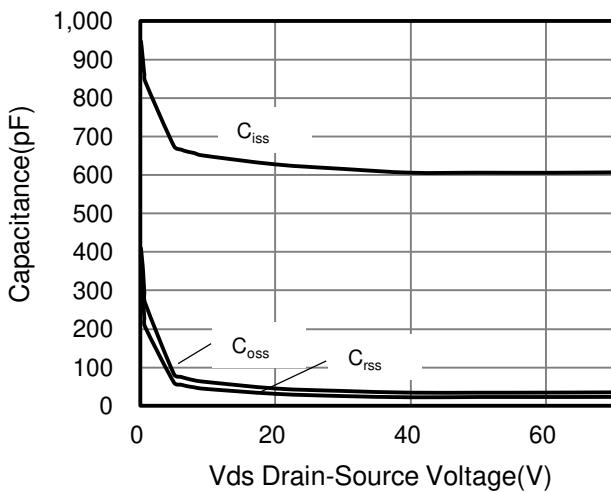
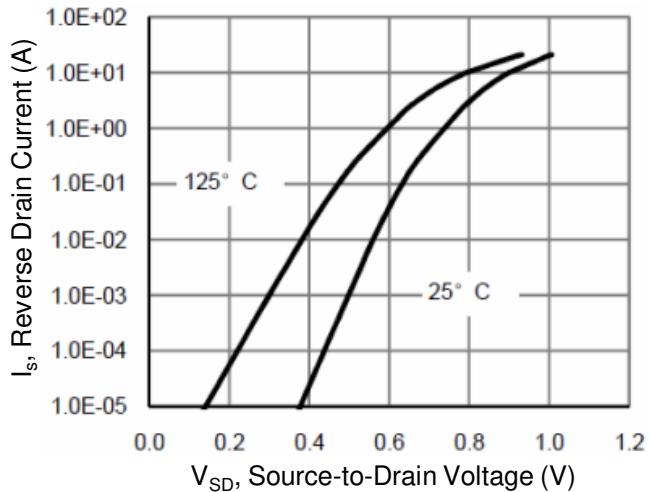


Figure 6. Source-Drain Diode Forward



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

Figure 7. Drain-Source On-Resistance

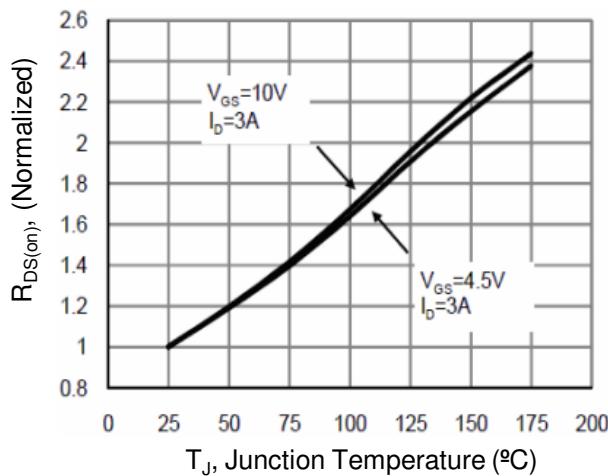


Figure 8. Safe Operation Area

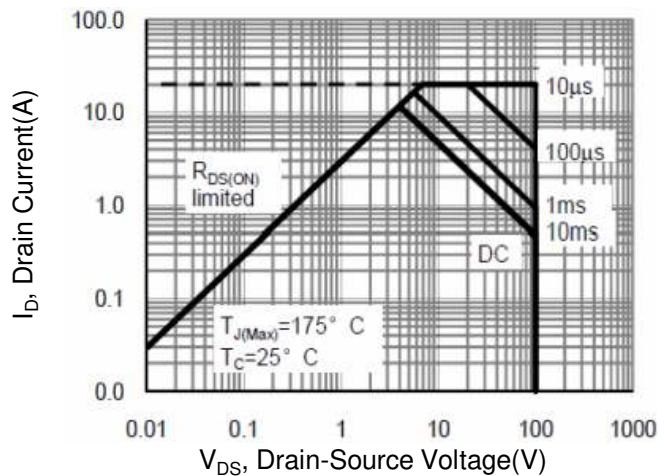
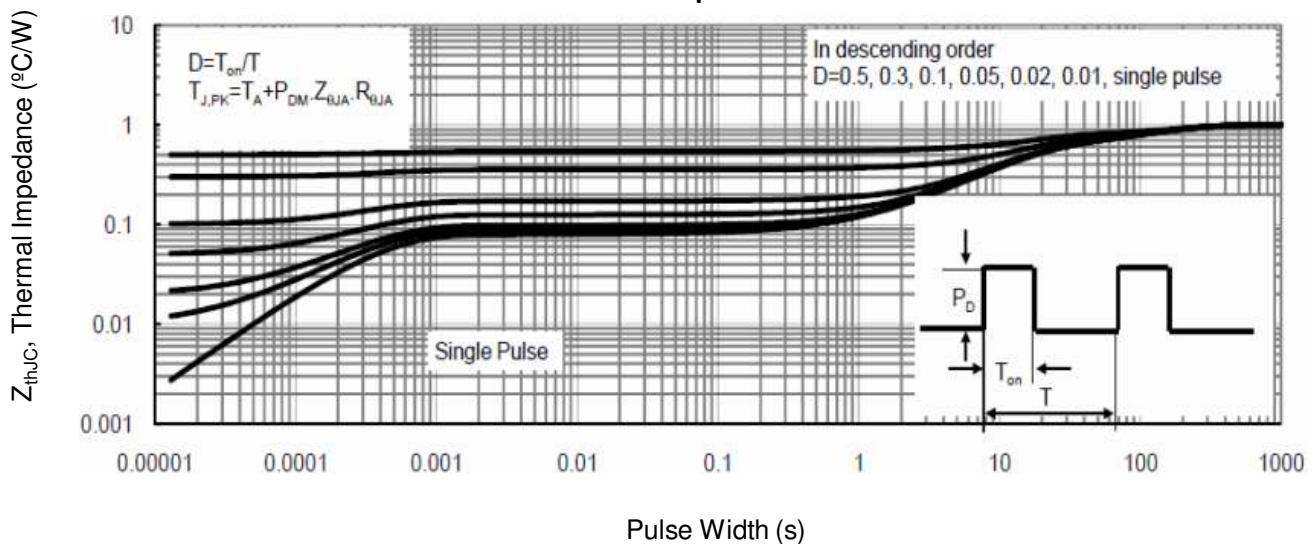
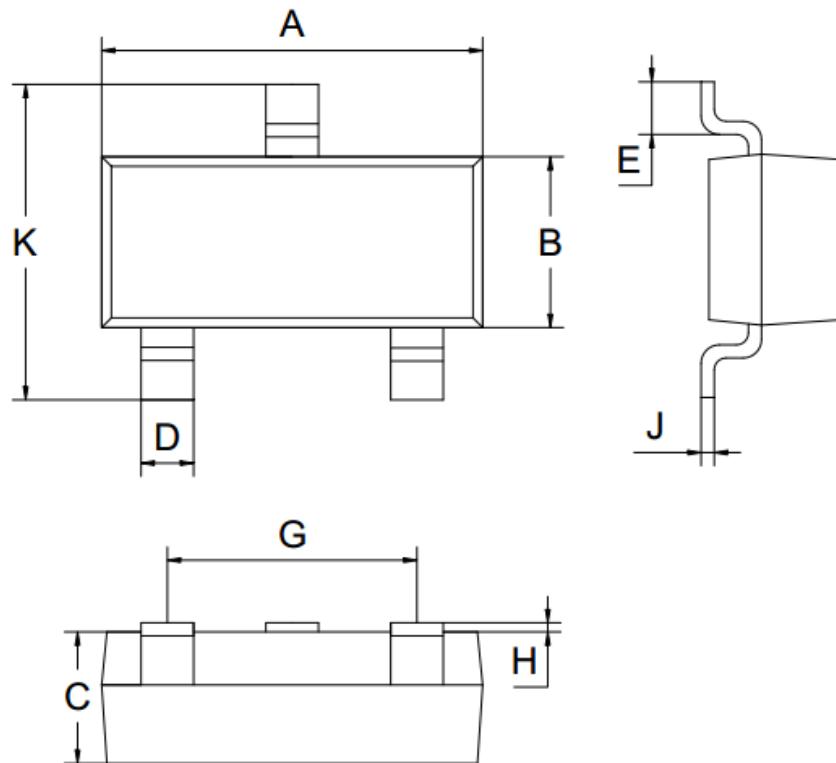


Figure 9. Normalized Maximum Transient Thermal Impedance



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			