N-Channel Enhancement Mode Power MOSFET

Description

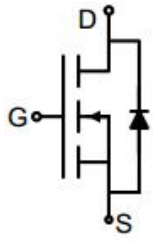
The 03N06L uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

- V_{DS} 60V
- I_D (at V_{GS} = 10V) 3A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 95mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 100mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



SOT-23-3

Ordering Information

Device	Package	Marking	Packaging
03N06L	SOT-23-3	03N06	3000pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Continuous Drain Current	T_C = 25ºC	I_D	3	A
	T_C = 100ºC		1.9	
Pulsed Drain Current (note1)		I_{DM}	12	A
Gate-Source Voltage		V_{GS}	±20	V
Power Dissipation		P_D	1.7	W
Single pulse avalanche energy (note2)		E_{AS}	6	mJ
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient, t≤10s	R_{thJA}	73.5	ºC/W

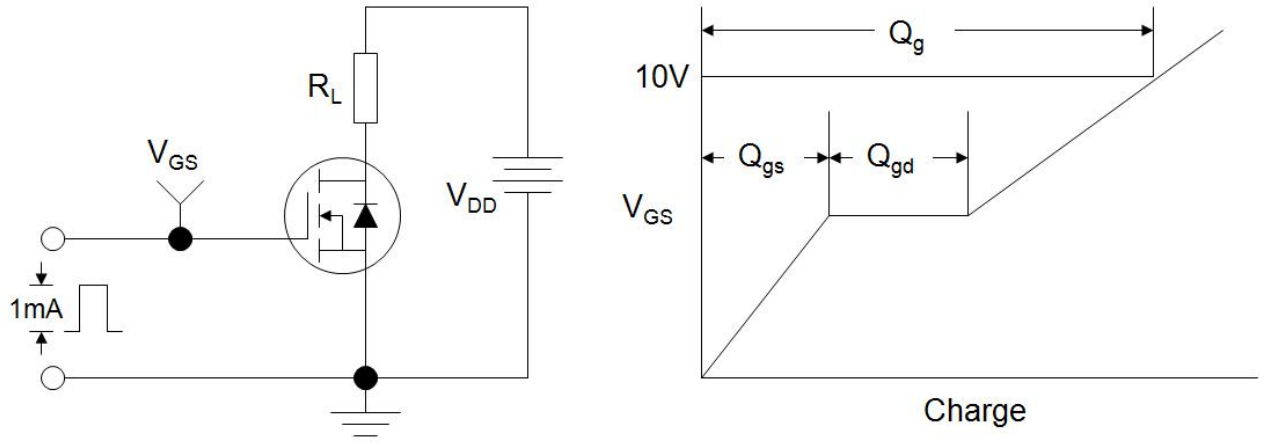
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.7	0.9	1.2	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 2A	--	73	95	mΩ
		V_{GS} = 4.5V, I_D = 2A	--	77	100	
Forward Transconductance	g_{FS}	V_{GS} = 5V, I_D = 2A	--	9	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 30V, f = 1.0MHz	--	480	--	pF
Output Capacitance	C_{oss}		--	28	--	
Reverse Transfer Capacitance	C_{rss}		--	23	--	
Total Gate Charge	Q_g	V_{DD} = 30V, I_D = 2A, V_{GS} = 10V	--	15	--	nC
Gate-Source Charge	Q_{gs}		--	2	--	
Gate-Drain Charge	Q_{gd}		--	3	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 30V, I_D = 2A, R_G = 1Ω	--	6	--	ns
Turn-on Rise Time	t_r		--	15	--	
Turn-off Delay Time	$t_{d(off)}$		--	15	--	
Turn-off Fall Time	t_f		--	10	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	3	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 2A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Qrr	I_F = 2A, V_{GS} = 0V di/dt=100A/us	--	38	--	nC
Reverse Recovery Time	Trr		--	36	--	ns

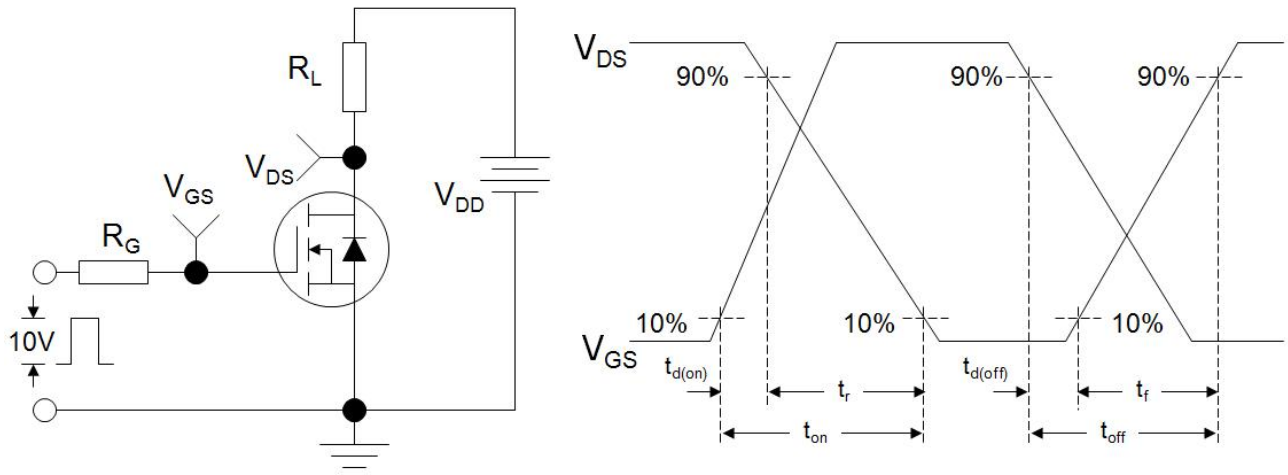
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : Tj=25℃ ,VDD=50V,VGS=10V,L=0.5mH,Rg=25Ω
   The table shows the minimum avalanche energy, which is 16mJ when the device is tested until failure
3. Identical low side and high side switch with identical R_G

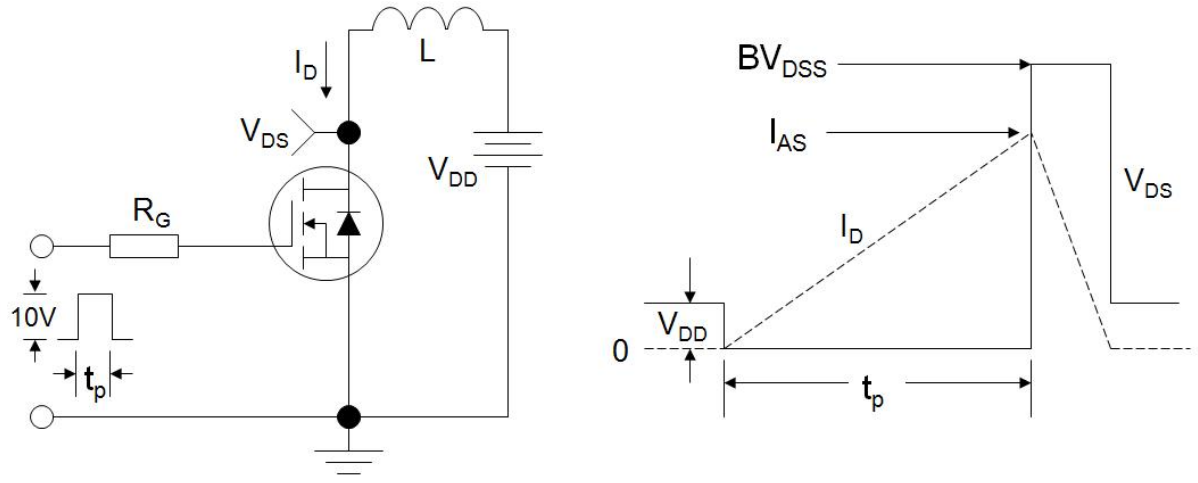
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

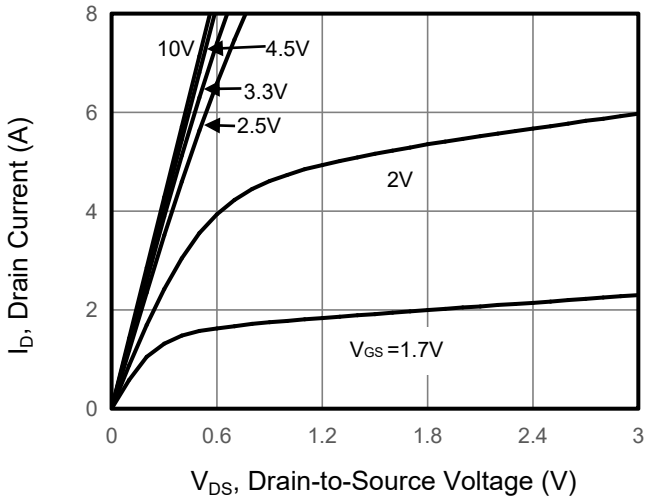


Figure 2. Transfer Characteristics

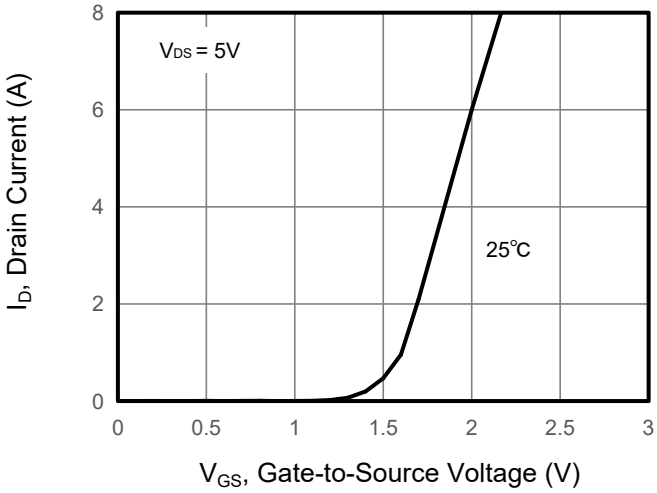


Figure 3. Drain Source On Resistance

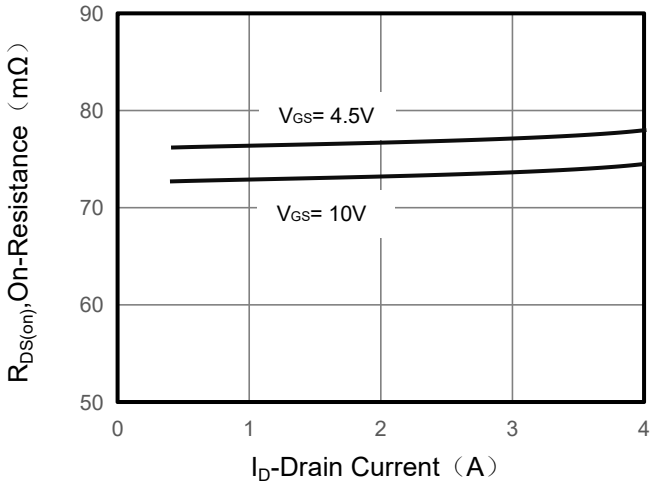


Figure 4. Gate Charge

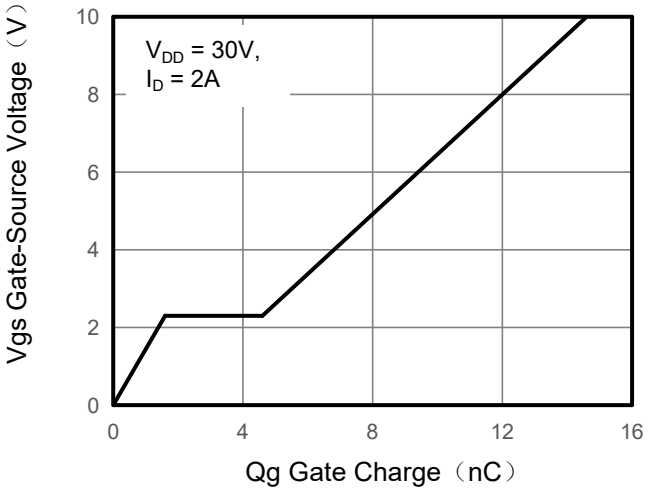


Figure 5. Capacitance

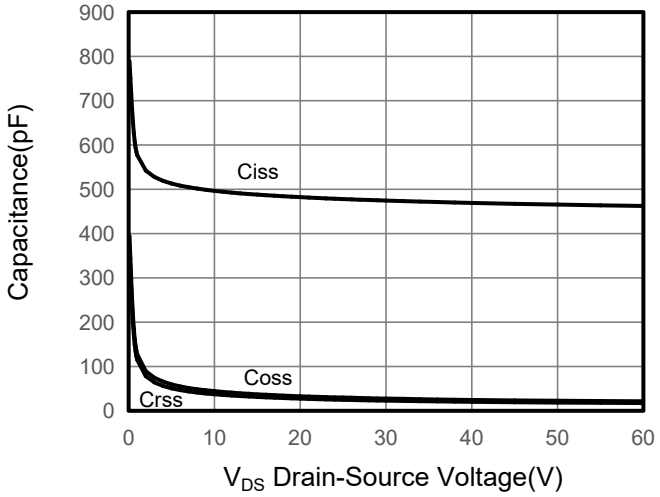
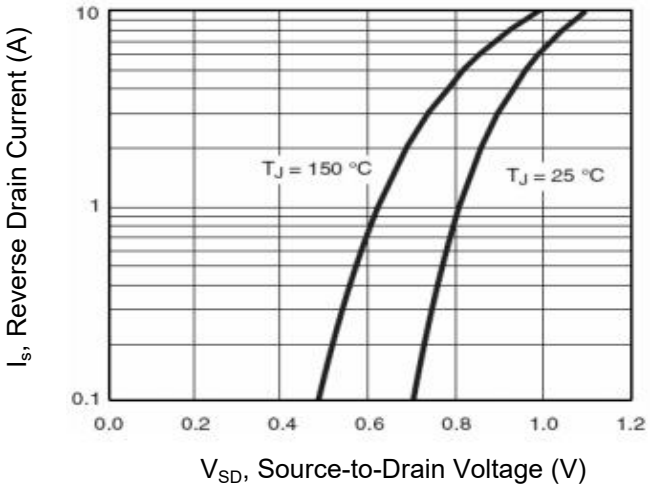


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

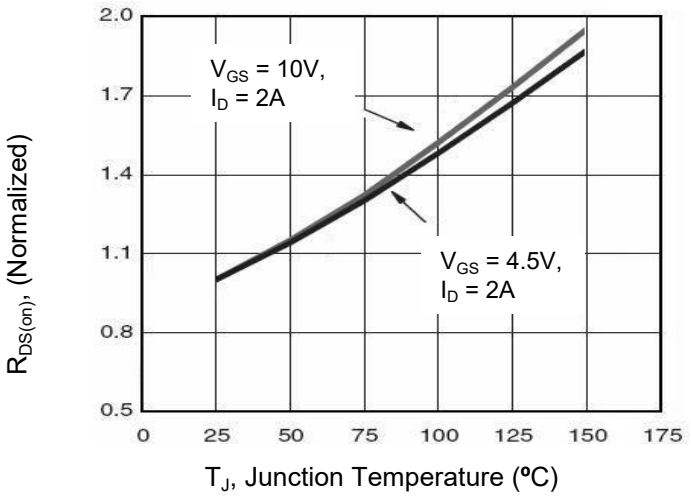


Figure 8. Safe Operation Area

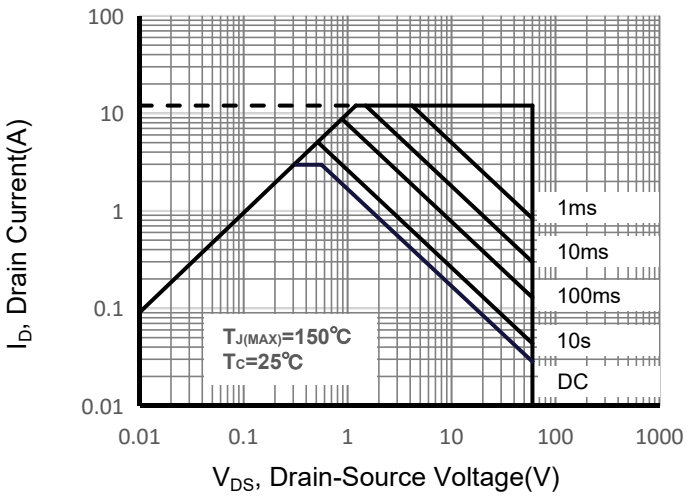


Figure 9. Maximum Continuous Drain Current vs Case Temperature

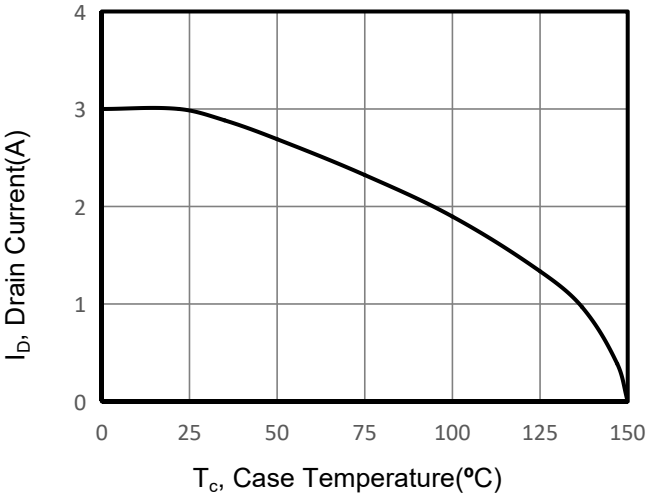
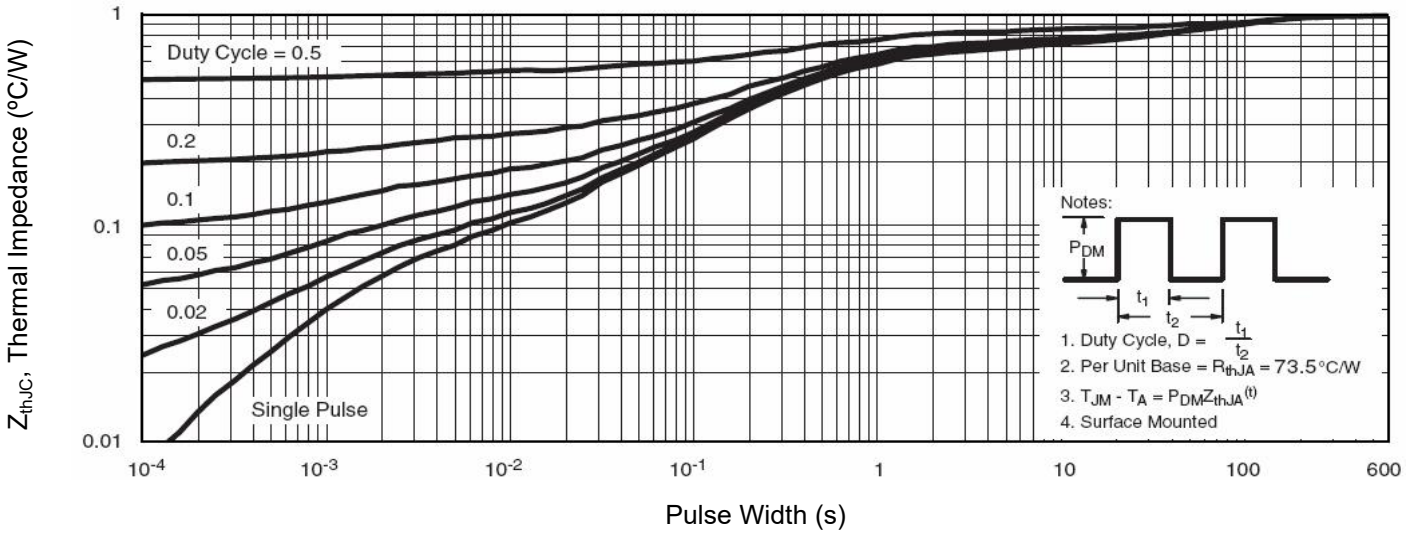


Figure 10. Normalized Maximum Transient Thermal Impedance



SOT-23-3 Package Information

