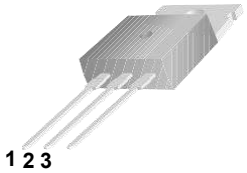
General Description：

240N06 , the silicon N-channel Enhanced VDMOSFETs, is obtained by advanced Trench Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-220AB, which accords with the RoHS standard.

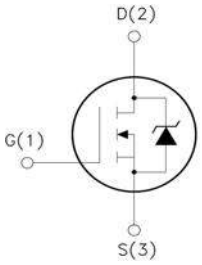
V_{DSS}	60	V
I_D（Silicon limited current）	240	A
I_D（Package limited current）	120	A
$P_D(T_C=25℃)$	297.6	W
$R_{DS(ON)Typ}$	2.5	mΩ

TO-220AB



Features：

- **Fast Switching**
- **Low ON Resistance**
- **Low Gate Charge**
- **Low Reverse transfer capacitances(Typical:504pF)**
- **100% Single Pulse avalanche energy Test**



1.Gate (G)
2.Drain (D)
3.Source (S)

Applications：

Power switch circuit of adaptor and charger.

Absolute（T_J= 25℃ unless otherwise specified）：

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	60	V
I_D	Continuous Drain Current T_C = 25 °C（Silicon limited）	240	A
	Continuous Drain Current T_C = 25 °C（Package limited）[a1]	120	A
	Continuous Drain Current T_C = 100 °C（Package limited）[a1]	120	A
I_{DM}[a1]	Pulsed Drain Current T_C = 25 °C	480	A
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}[a2]	Single Pulse Avalanche Energy	1089	mJ
P_D	Power Dissipation T_C = 25 °C	297.6	W
	Derating Factor above 25°C	2.38	W/℃
T_J， T_{stg}	Operating Junction and Storage Temperature Range	150，–55 to 150	℃
T_L	Maximum Temperature for Soldering	300	℃

Electrical Characteristics（T_J= 25℃ unless otherwise specified）：

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} =60V, V_{GS}= 0V, T_J = 25℃	--	--	1	μA
		V_{DS} =48V, V_{GS}= 0V, T_J = 125℃	--	--	100	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-20V	--	--	-100	nA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=95A	--	2.5	3	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	--	4.0	V
Pulse width tp≤300μs, δ ≤2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	--	1.1	--	Ω
C_{iss}	Input Capacitance	V_{GS}=0V， V_{DS}=50V f=1.0MHz	--	7902	--	pF
C_{oss}	Output Capacitance		--	746	--	
C_{rss}	Reverse Transfer Capacitance		--	504	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{GS}=10V， R_G=2.7Ω V_{DD}=30V， I_D=75A	--	40	--	ns
tr	Rise Time		--	27.6	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	100.4	--	
t_f	Fall Time		--	29.2	--	
Q_g	Total Gate Charge	V_{GS}=10V， V_{DD}=30V I_D=75A	--	163.8	--	nC
Q_{gs}	Gate to Source Charge		--	34	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	56.3	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	120	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	480	A
V_{SD}	Diode Forward Voltage	I_S=95A,V_{GS}=0V	--	--	1.2	V
trr	Reverse Recovery Time	I_S=75A,T_j = 25℃ dI_F/dt=100A/us,	--	66	--	ns
Qrr	Reverse Recovery Charge		--	113.5	--	nC
I_{RRM}	Reverse Recovery Current		--	3.7	--	A
Pulse width tp≤300μs, δ ≤2%						

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Junction-to-Case	0.42	℃/W
$R_{\theta JA}$	Junction-to-Ambient	62.5	℃/W

[a1]: Calculated continuous current based on maximum allowable junction temperature. Note that current limitations arising from heating of the device leads may occur with some lead mounting arrangements.

[a2]: L=0.5mH, I_D=66A, Start T_J=25℃

Characteristics Curve：

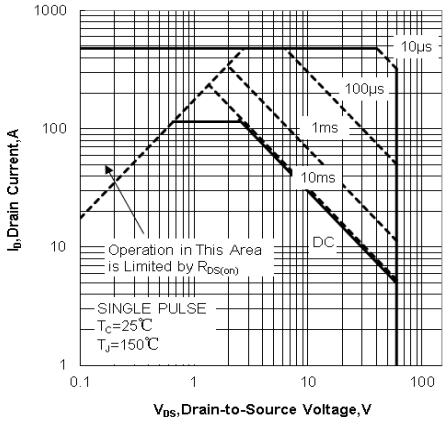


Figure1. Maximum Forward Bias Safe Operating Area

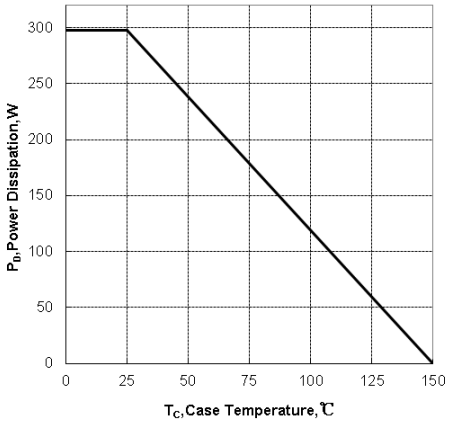


Figure2. Maximum Power Dissipation vs Case Temperature

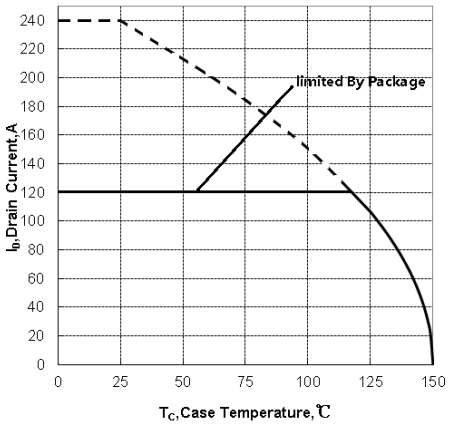


Figure3. Maximum Continuous Drain Current vs Case Temperature

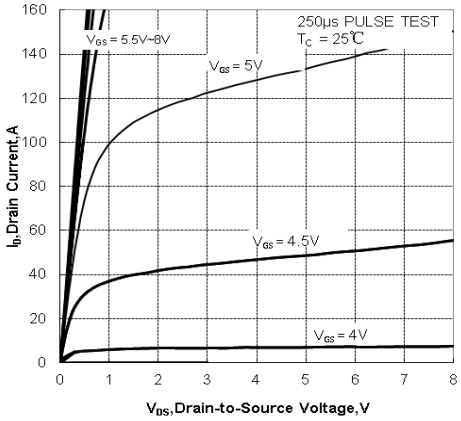


Figure 4. Typical Output Characteristics

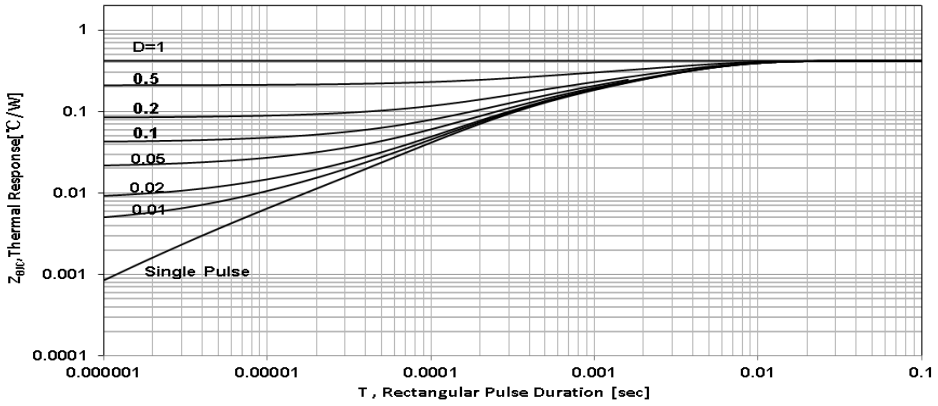


Figure5. Maximum Effective Transient Thermal Impedance, Junction-to-Case

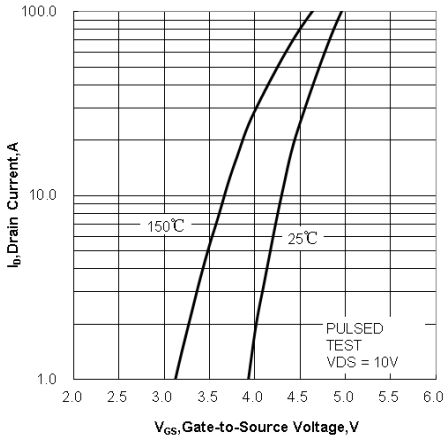


Figure 6. Typical Transfer Characteristics

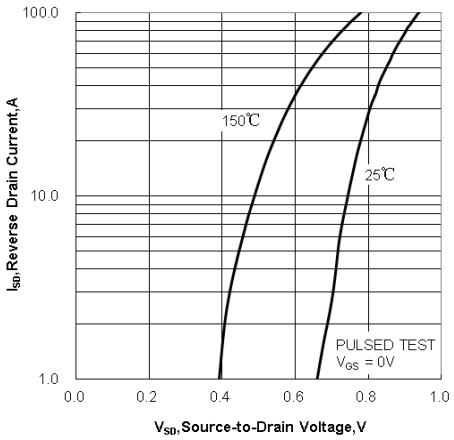


Figure 7. Typical Body Diode Transfer Characteristics

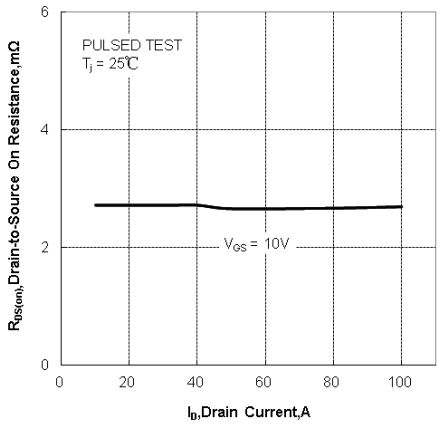


Figure 8. Drain-to-Source On Resistance vs Drain Current

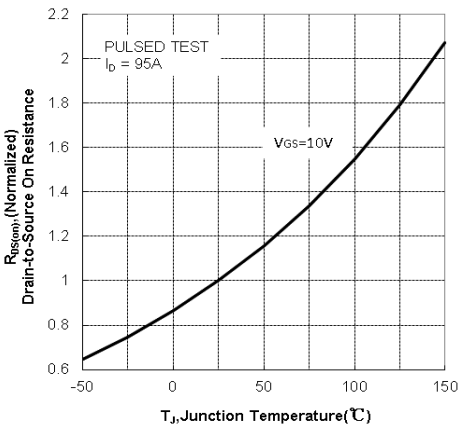


Figure 9. Nomalized on Resistance vs Junction Temperature

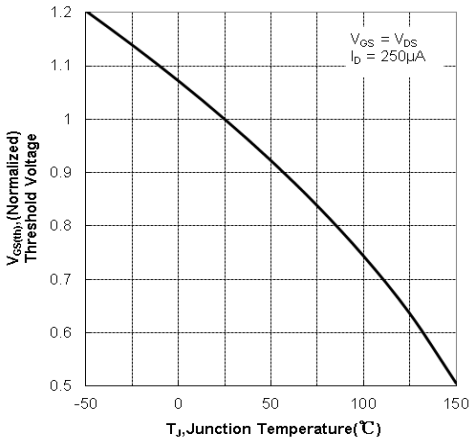


Figure 10. Nomalized Theshold Voltage vs Junction Temperature

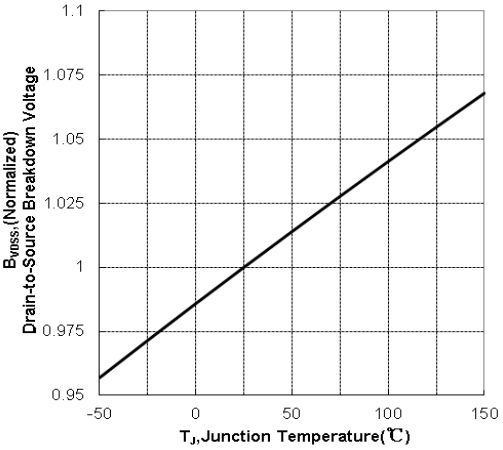


Figure 11. Nomalized Breakdown Voltage vs Junction Temperature

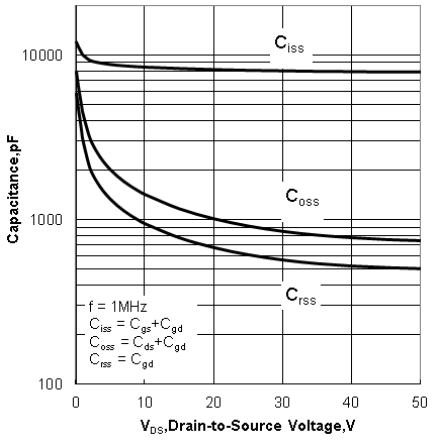


Figure12. Capacitance Characteristics

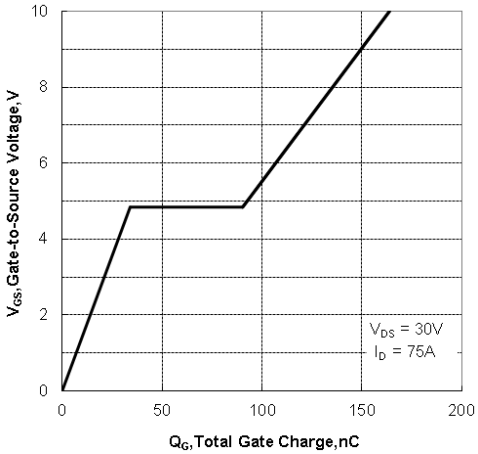


Figure13. Typical Gate Charge vs Gate to Source Voltage

Test Circuit and Waveform

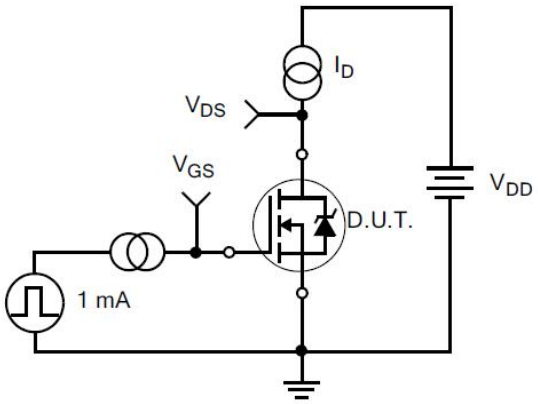


Figure 14. Gate Charge Test Circuit

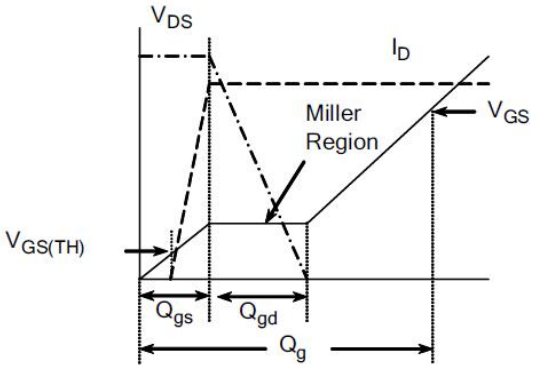


Figure 15. Gate Charge Waveforms

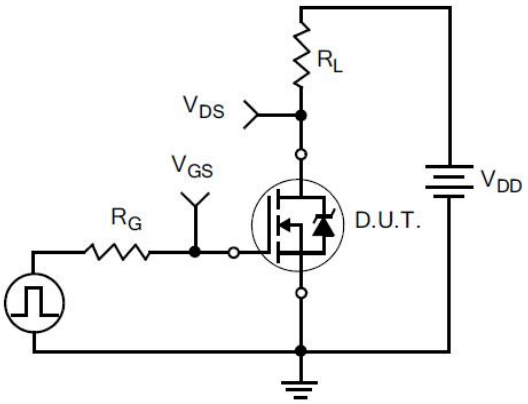


Figure 16. Resistive Switching Test Circuit

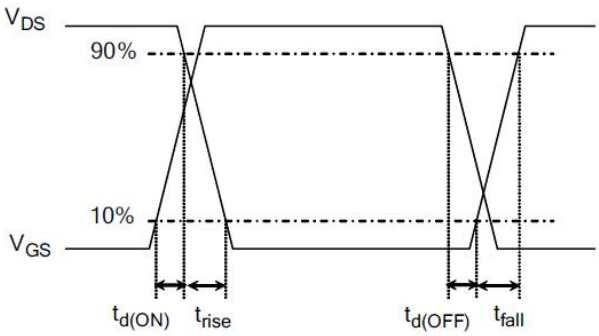


Figure 17. Resistive Switching Waveforms

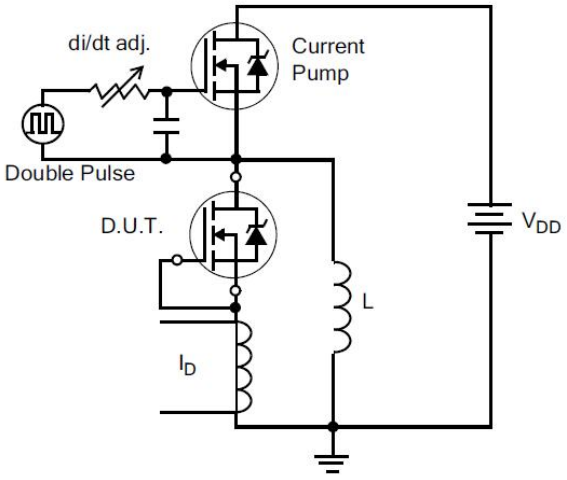


Figure 18. Diode Reverse Recovery Test Circuit

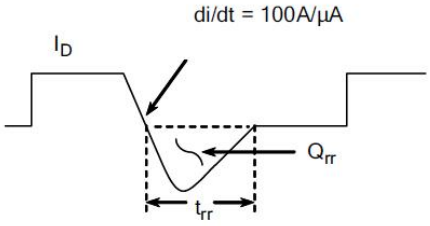


Figure 19. Diode Reverse Recovery Waveform

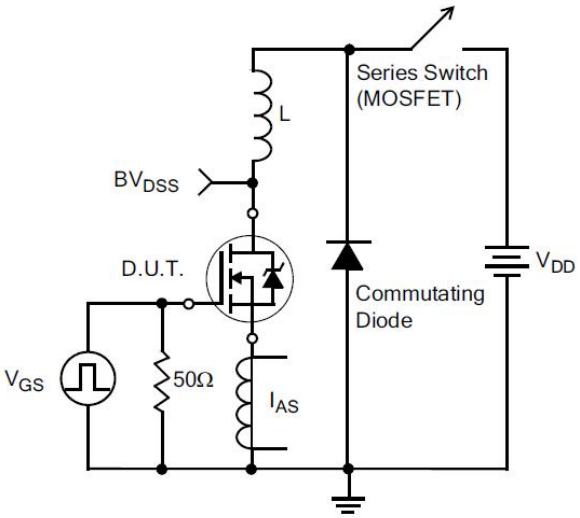


Figure20.Unclamped Inductive Switching Test Circuit

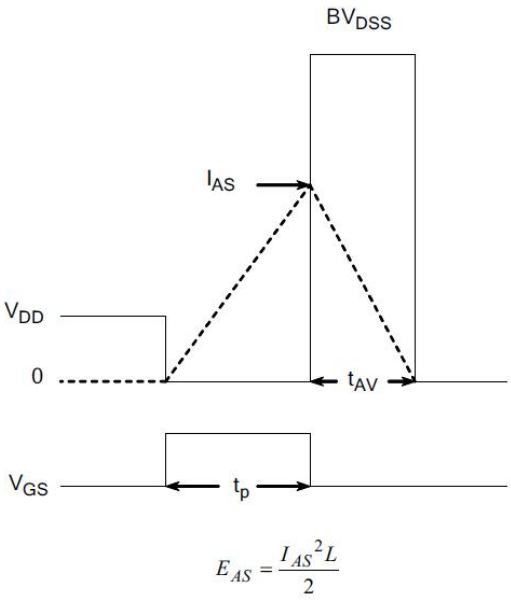
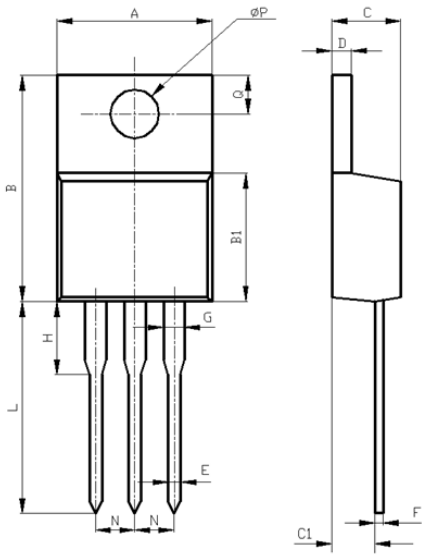


Figure21.Unclamped Inductive Switching Waveform

Package Information：



Items	Values(mm)	
	MIN	MAX
A	9.60	10.6
B	15.0	16.0
B1	8.90	9.50
C	4.30	4.80
C1	2.30	3.10
D	1.20	1.40
E	0.70	0.90
F	0.30	0.60
G	1.17	1.37
H	2.70	3.80
L*	12.6	14.8
N	2.34	2.74
Q	2.40	3.00
ΦP	3.50	3.90

*adjustable

TO-220AB Package