N-Channel Enhancement Mode Power MOSFET

Features

- V_{DS}=70V； I_D=120A@ V_{GS}=10V
  $R_{DS(ON)}$< 4 mΩ @ V_{GS} =10V ；
- Low gate charge
- Low Crss (typical 197pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- Rohs product

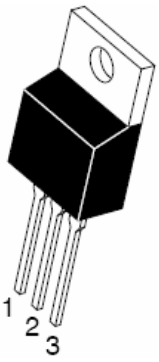
Application

- High efficiency switch mode power supplies
- UPS

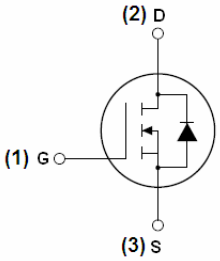
Product Summary

BV_{DSS}	typ.	60	V
$R_{DS(ON)}$	typ.	4	mΩ
	max.	6	mΩ
I_D		120	A

100% UIS TESTED!



TO-220-3L top view



Schematic diagram

Package Marking And Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
YMP120N06	YMP120N06	TO-220-3L	-	-	-

Table 1. Absolute Maximum Ratings (TA=25℃)

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	60	V
Gate-Source Voltage (V_{DS}=0V)	V_{GS}	±20	V
Drain Current (DC) at Tc=25℃	$I_{D\ (DC)}$	120	A
Drain Current (DC) at Tc=100℃	$I_{D\ (DC)}$	80	A
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_{DM\ (pluse)}$	390	A
Maximum Power Dissipation(Tc=25℃)	P_D	200	W
Derating factor		1.29	W/℃
Single pulse avalanche energy (Note 2)	E_{AS}	900	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

2.EAS condition：Tj=25℃,V_{DD}=50V, L=0.15mH R_g=25Ω;

Table 2. Thermal Characteristic

Parameter	Symbol	Value	Unit
Thermal Resistance，Junction-to-Case（Note2） ）	R_{thJC}	0.74	℃/W

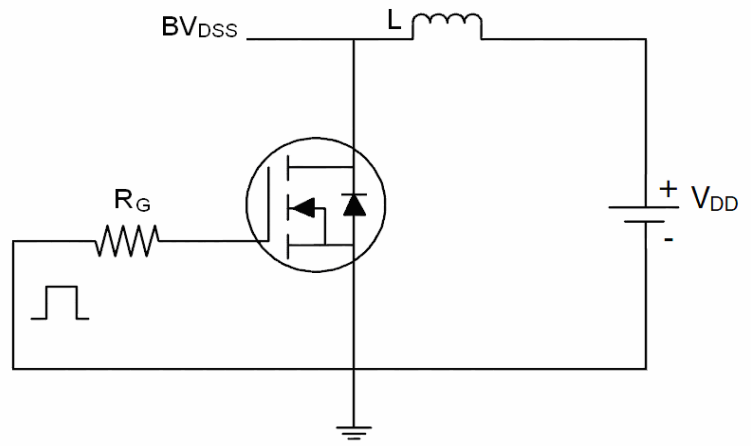
Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA		60		V
Zero Gate Voltage Drain Current(Tc=25℃)	I_{DSS}	V_{DS}=55V,V_{GS}=0V			10	μA
Gate-Body Leakage Current	I_{DSS}	V_{GS}=±20V,V_{DS}=0V			±100	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2	-	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=40A			8	mΩ
Dynamic Characteristics						
Forward Transconductance	g_{FS}	V_{DS}=25V,I_D=40A	43			S
Input Capacitance	C_{lss}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz		3101		PF
Output Capacitance	C_{oss}			749		PF
Reverse Transfer Capacitance	C_{rss}			197		PF
Total Gate Charge	Q_g	V_{DS}=44V,I_D=40A, V_{GS}=10V			118	nC
Gate-Source Charge	Q_{gs}				24	nC
Gate-Drain Charge	Q_{gd}				48	nC
Switching times						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=28V,I_D=40A,R_G=25 Ω		17		nS
Turn-on Rise Time	t_r			122		nS
Turn-Off Delay Time	$t_{d(off)}$	V_{DD}=28V,I_D=40A,R_G=25Ω		57		nS
Turn-Off Fall Time	t_f			72		nS
Source- Drain Diode Characteristics						
Source-drain current(Body Diode)	I_{SD}				40	A
Forward on voltage(Note 3)	V_{SD}	Tj=25℃,I_{SD}=40A,V_{GS}=0V			1.3	V
Reverse Recovery Time(Note 1)	t_{rr}	Tj=25℃,I_F=40A,di/dt=100A/μs		425		nS
Reverse Recovery Charge	Q_{rr}			4.31		nC
Forward Turn-on Time	t_{on}	Intrinsic turn-on time is negligible(turn-on is dominated by L_S+L_D)				

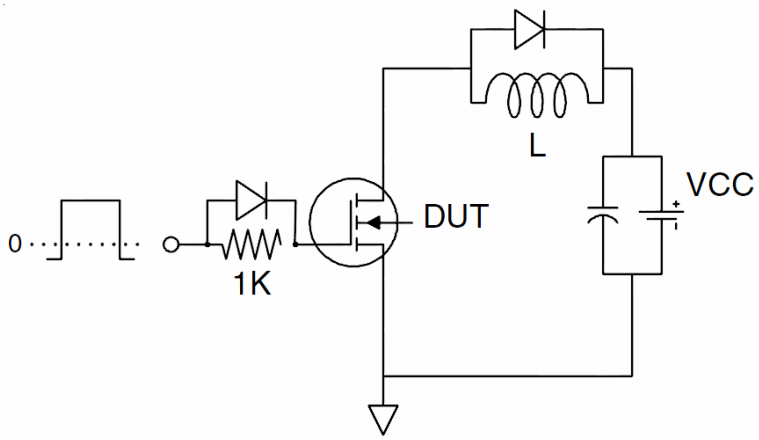
Notes 3.Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%, R_G =25 Ω, Starting Tj=25℃

Test circuit

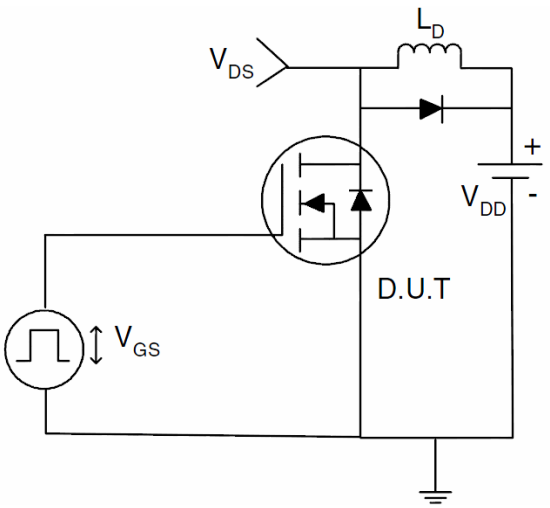
1）E_{AS} test Circuits



2）Gate charge test Circuit:



3）Switch Time Test Circuit：



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

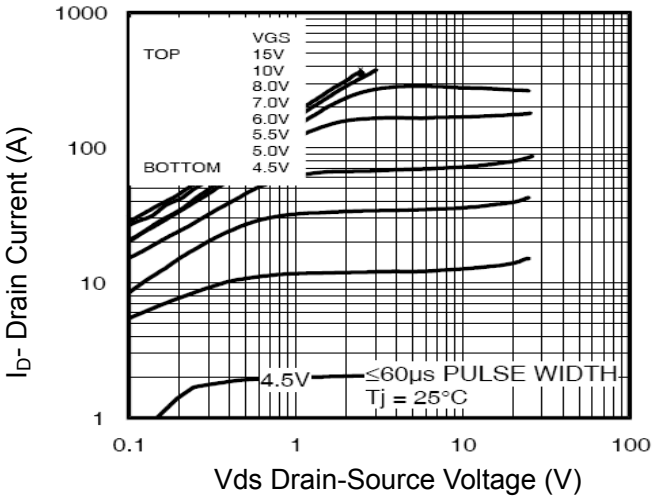


Figure 1 Output Characteristics

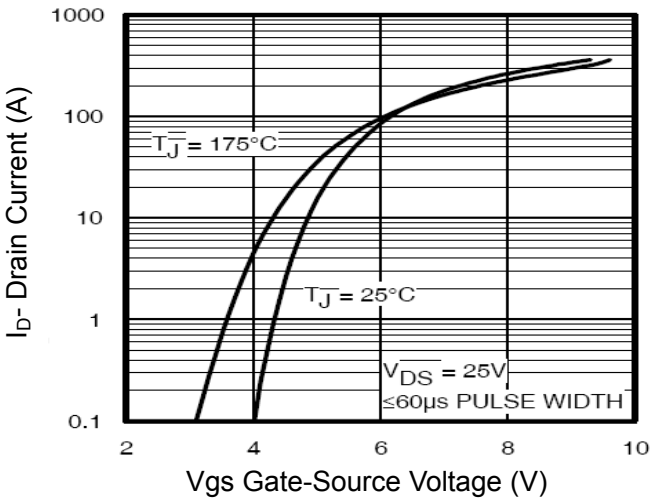


Figure 2 Transfer Characteristics

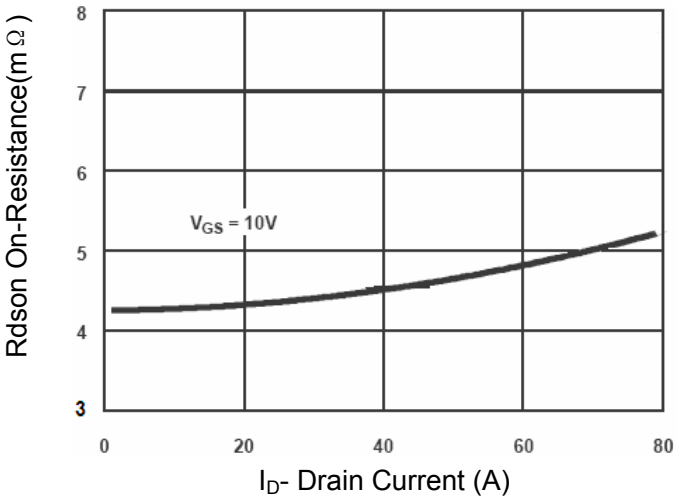


Figure 3 Rdson- Drain Current

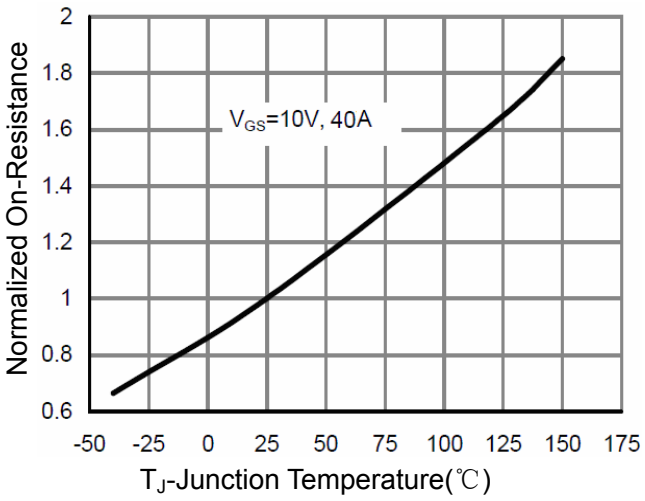


Figure 4 Rdson-JunctionTemperature

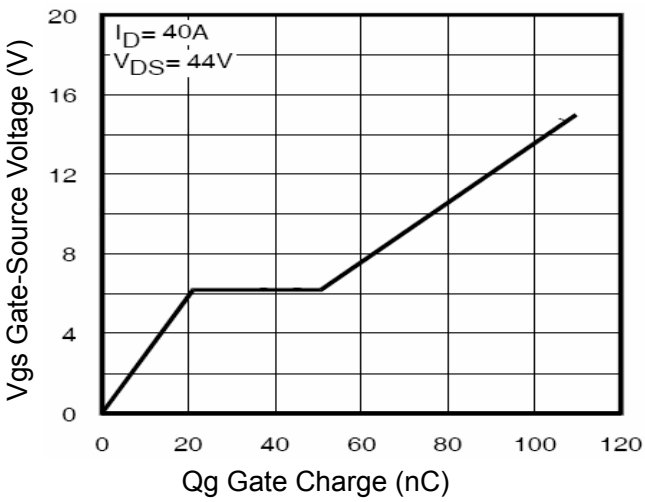


Figure 5 Gate Charge

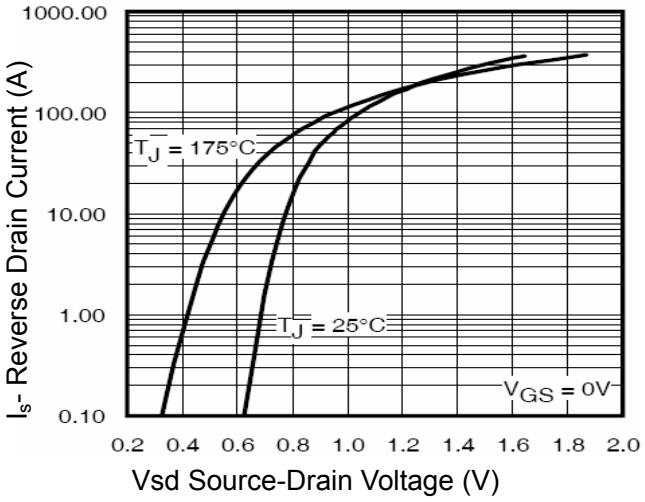


Figure 6 Source- Drain Diode Forward

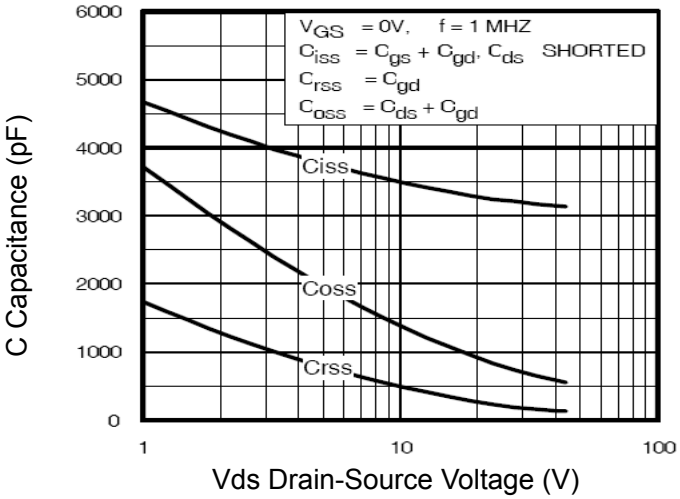


Figure 7 Capacitance vs Vds

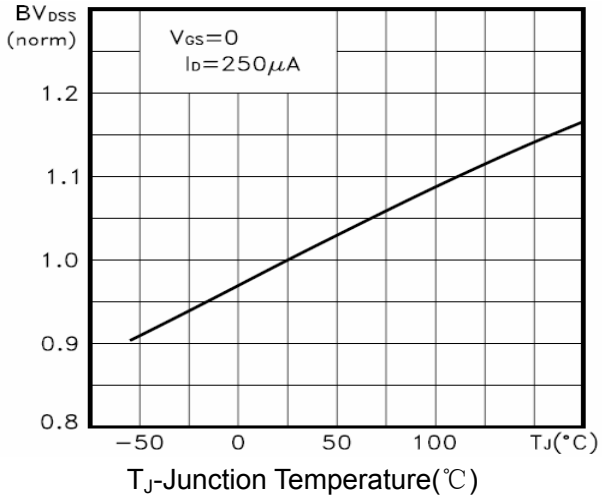


Figure 9 BV_{DSS} vs Junction Temperature

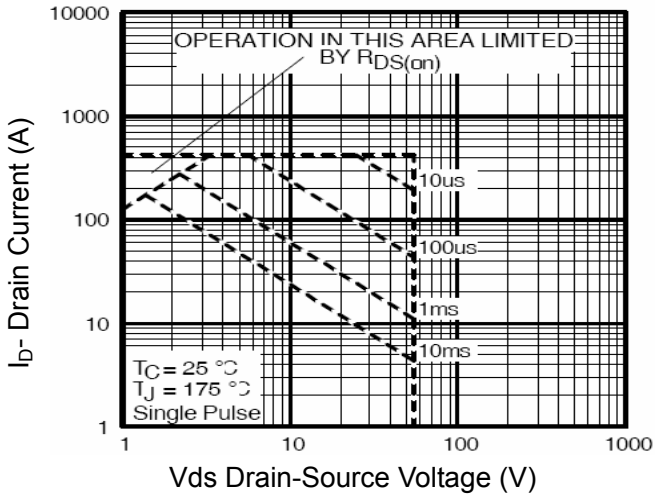


Figure 8 Safe Operation Area

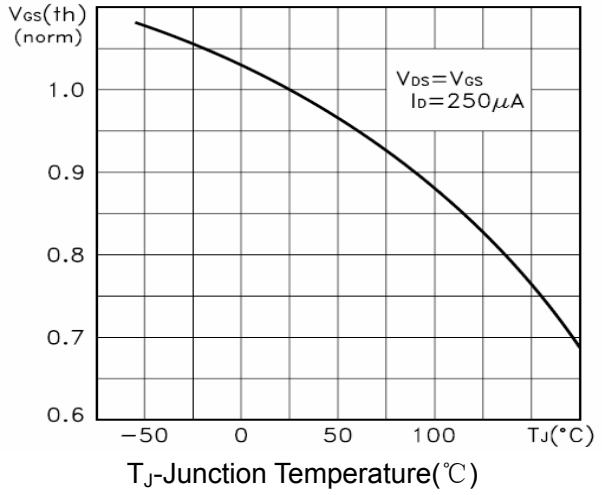


Figure 10 $V_{GS(th)}$ vs Junction Temperatur

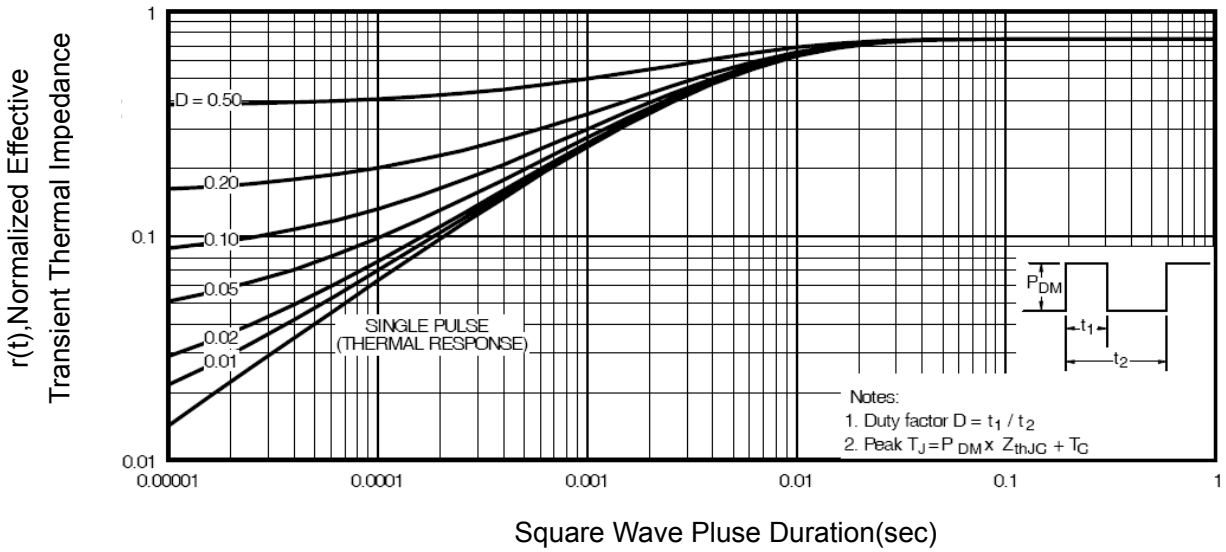
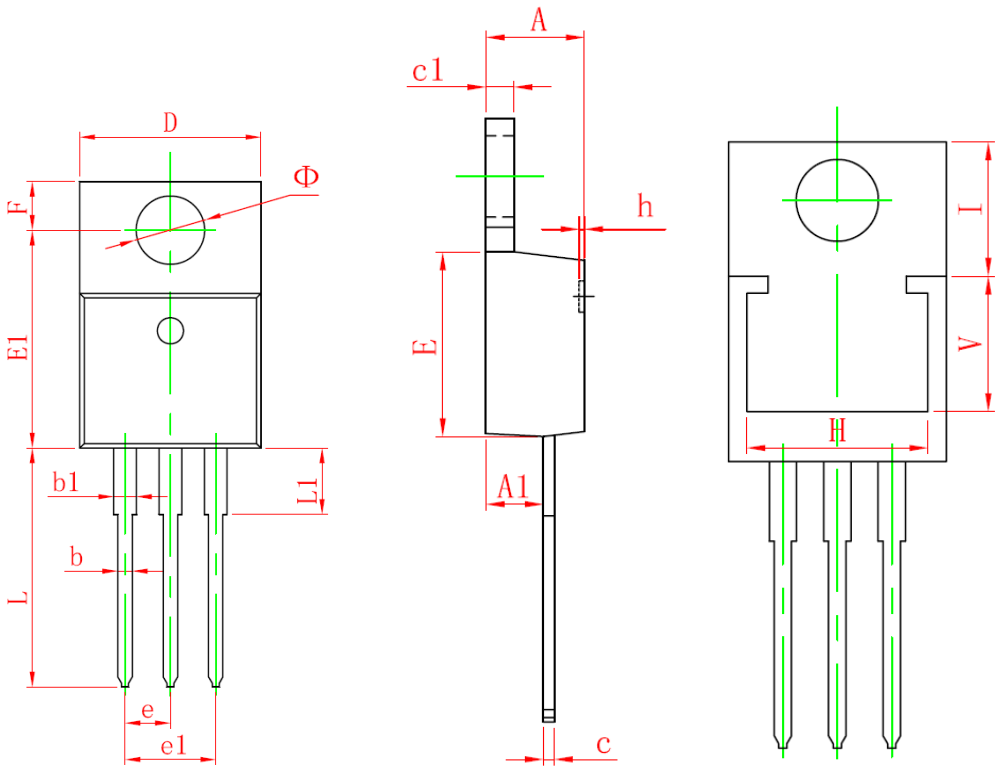


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-220-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	10.010	10.350	0.394	0.407
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540（TYP.）		0.100（TYP.）	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
H	8.440 REF.		0.332 REF.	
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
V	6.360 REF.		0.250 REF.	
I	6.300 REF.		0.248 REF.	
Φ	3.735	3.935	0.147	0.155

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