

CURRENT 7 Ampere
VOLTAGE RANG 650 Volts

ASE7N65

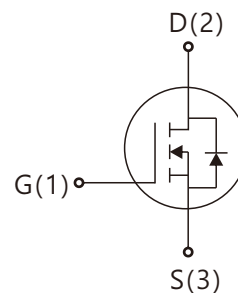
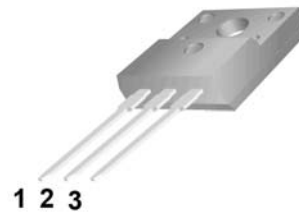
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Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg=29nC (Typ.).
- ☐ BVDSS=650V, I_D=7A
- ☐ R_{DS(on)} : 1.35Ω (Max) @V_G=10V
- ☐ 100% Avalanche Tested

TO-220F



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

Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

Symbol	Parameter		Value	Unit
V _{DSS}	Drain-Source Voltage		650	V
I _D	Drain Current	T _j =25°C	7.0	A
		T _j =100°C	4.7	
V _{GS(TH)}	Gate Threshold Voltage		30	V
E _{AS}	Single Pulse Avalanche Energy (note1)		300	mJ
I _{AR}	Avalanche Current (note2)		7.0	A
P _D	Power Dissipation (T _j =25°C)		50	W
T _j	Junction temperature(Max)		150	°C
T _{stg}	Storage Temperature		-55~+150	°C
TL	Maximum lead temperature for soldering purpose, 1/8' from case for 5 seconds		300	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJC}	Thermal Resistance, Junction to Case	-	2.4	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	-	62.5	°C/W

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Electrical Characteristics (Ta=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA , V _{GS} =0	650	-	-	V
△BVDSS/△T _J	Breakdown Voltage Temperature Coefficient	I _D =250μA ,Reference to 25°C	-	0.67	-	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650V, V _{GS} =0V	-	-	10	μA
		V _{DS} =520V, T _J =125°C			100	
I _{GSSF}	Gate-body leakage Current, Forward	V _{GS} =+30V, V _{DS} =0V	-	-	100	nA
I _{GSSR}	Gate-body leakage Current, Reverse	V _{GS} =-30V, V _{DS} =0V	-	-	-100	
On Characteristics						
V _{GS(TH)}	Date Threshold Voltage	I _D =250μA,V _{DS} =V _{GS}	2	-	4	V
R _{DS(ON)}	Static Drain-Source On-Resistance	I _D =3.5A,V _{GS} =10V	-	1.25	1.35	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	V _{DS} =25V , V _{GS} =0 , f=1.0MHz	-	1000	-	pF
Coss	Output Capacitance		-	95	-	
Crss	Reverse Transfer Capacitance		-	2.4	-	
Switching Characteristics						
Td(on)	Turn-On Delay Time	V _{DD} =325V , I _D =7A R _G =25Ω (Note 3,4)	-	30	70	nS
Tr	Turn-On Rise Time		-	80	170	
Td(off)	Turn-Off Delay Time		-	65	140	
Tf	Turn-Off Rise Time		-	60	130	
Qg	Total Gate Charge	V _{DS} =520V,V _{GS} =10V , I _D =7A (Note 3,4)	-	29	38	nC
Qgs	Gate-Source Charge		-	7	-	
Qgd	Gate-Drain Charge		-	14.5	-	
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Max. Diode Forward Current	-	-	-	7	A
I _{SM}	Max. Pulsed Forward Current	-	-	-	28	
V _{SD}	Diode Forward Voltage	I _D =7A	-	-	1.4	V
Trr	Reverse Recovery Time	I _S =7A,V _{GS} =0V diF/dt=100A/μs	-	293	-	nS
Qrr	Reverse Recovery Charge	(Note3)	-	1.7	-	μC

Notes : 1, L=0.5mH, IAS= 7A, VDD=50V, RG=25Ω, Starting T_J =25°C
 2, Repetitive Rating : Pulse width limited by maximum junction temperature
 3, Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
 4, Essentially Independent of Operating Temperature

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Typical Characteristics

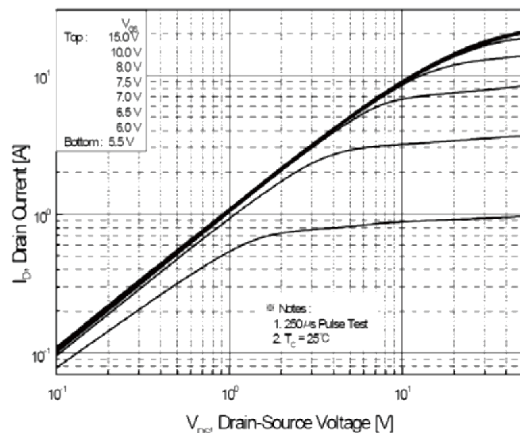


Figure 1. On-Region Characteristics

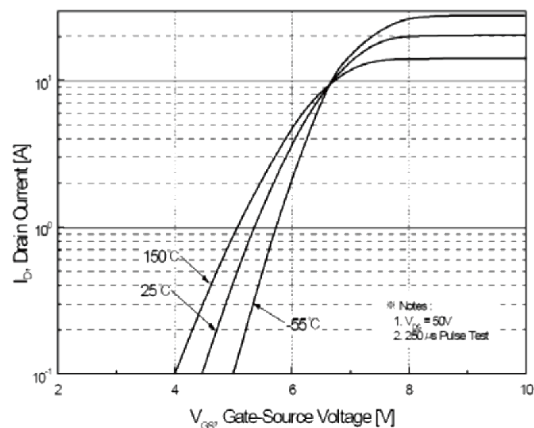


Figure 2. Transfer Characteristics

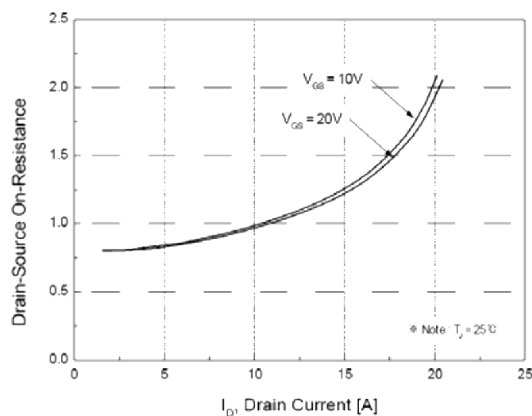


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

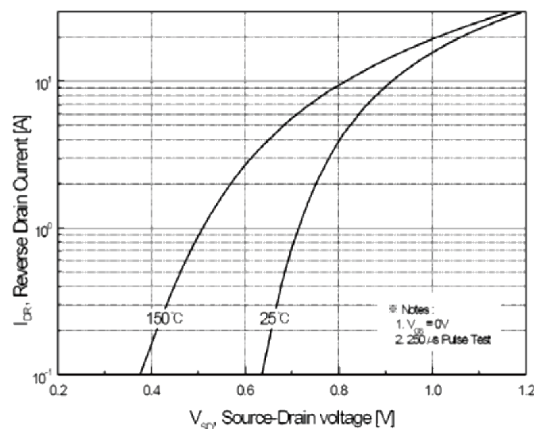


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

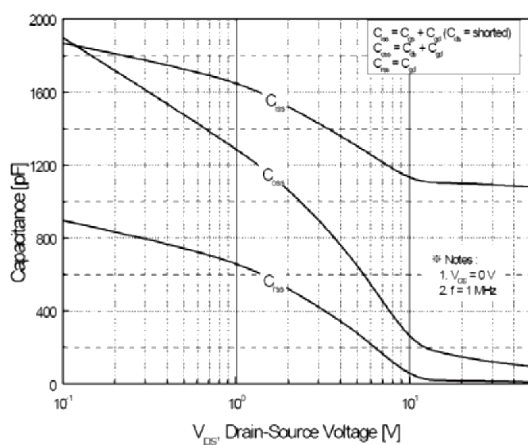


Figure 5. Capacitance Characteristics

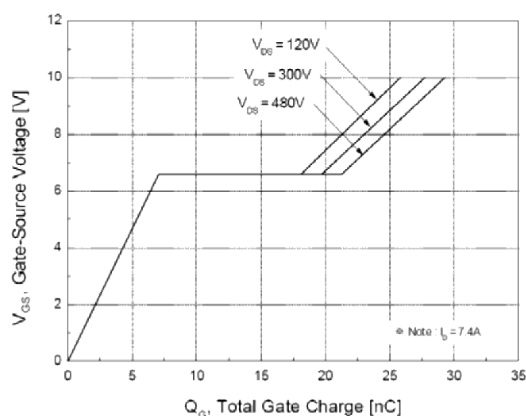


Figure 6. Gate Charge Characteristics

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Typical Characteristics (Continued)

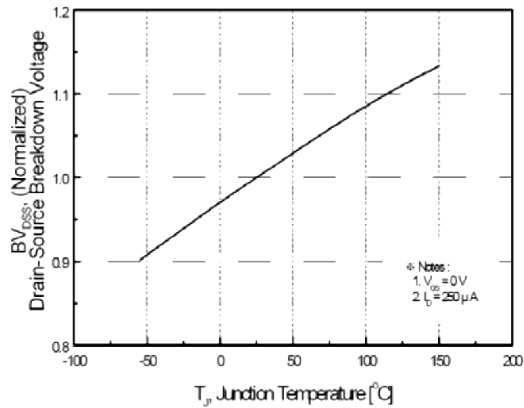


Figure 7. Breakdown Voltage Variation vs Temperature

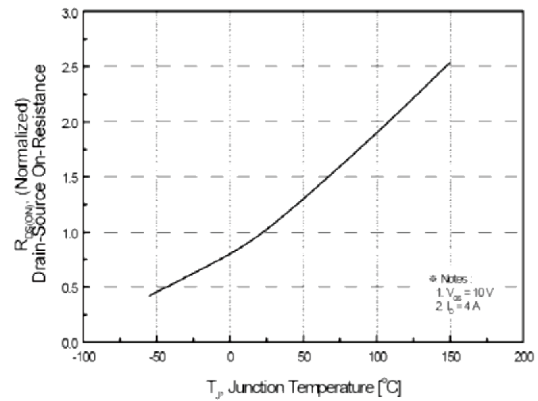


Figure 8. On-Resistance Variation vs Temperature

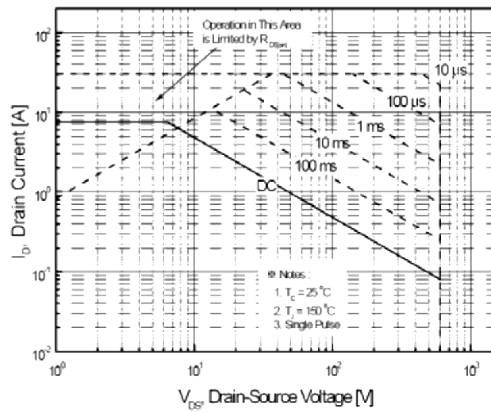


Figure 9-2. Maximum Safe Operating Area

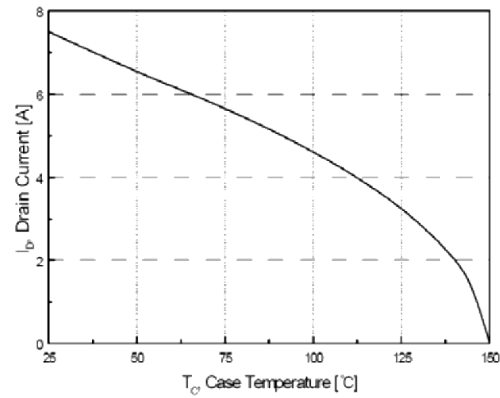


Figure 10. Maximum Drain Current vs Case Temperature

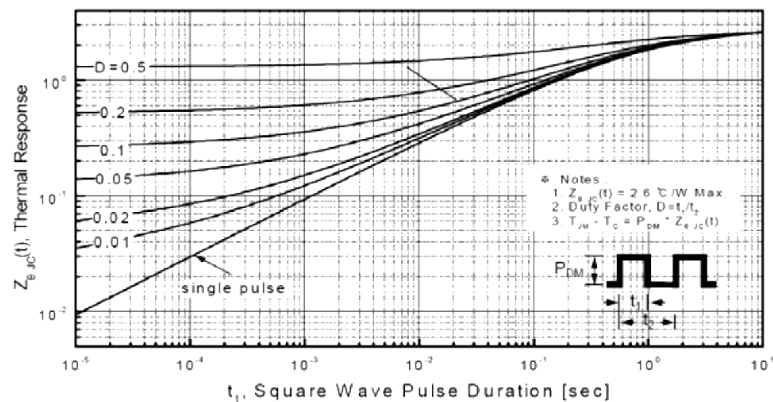
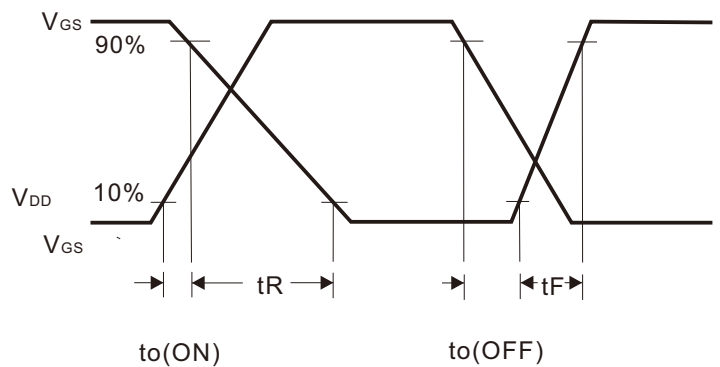
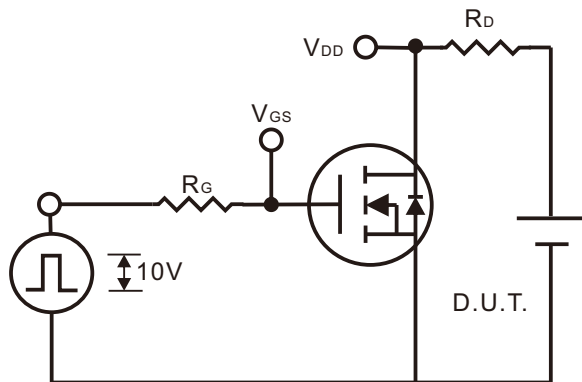


Figure 11-2. Transient Thermal Response Curve

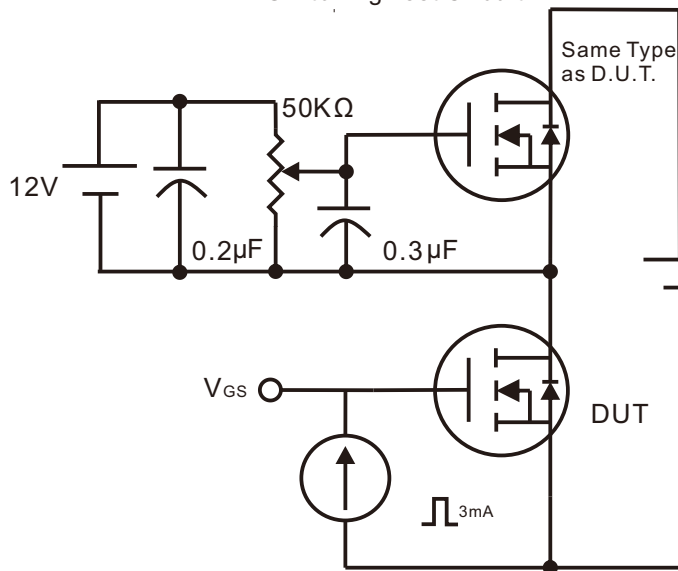
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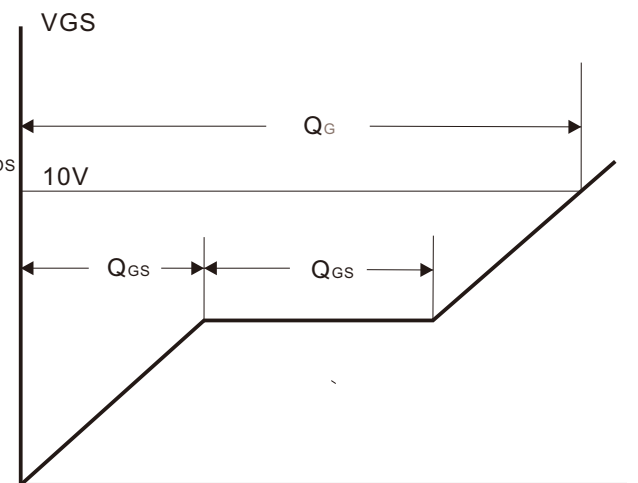
Gate Charge Test Circuit & Waveform



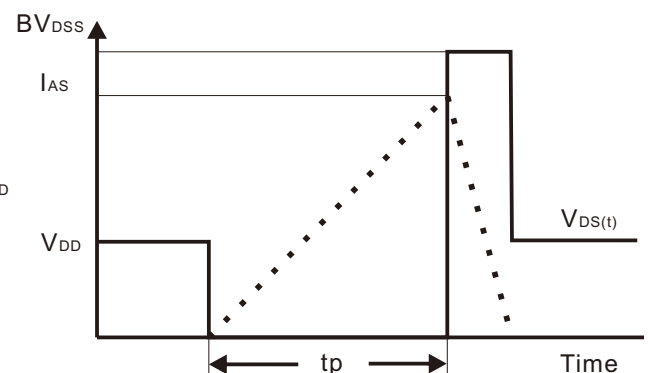
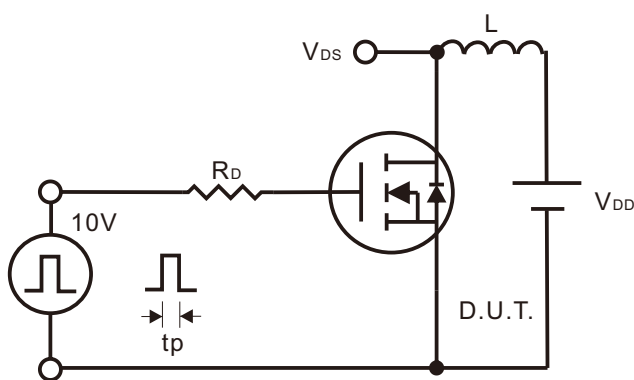
Switching Test Circuit



Switching Waveforms



Gate Charge Test Circuit



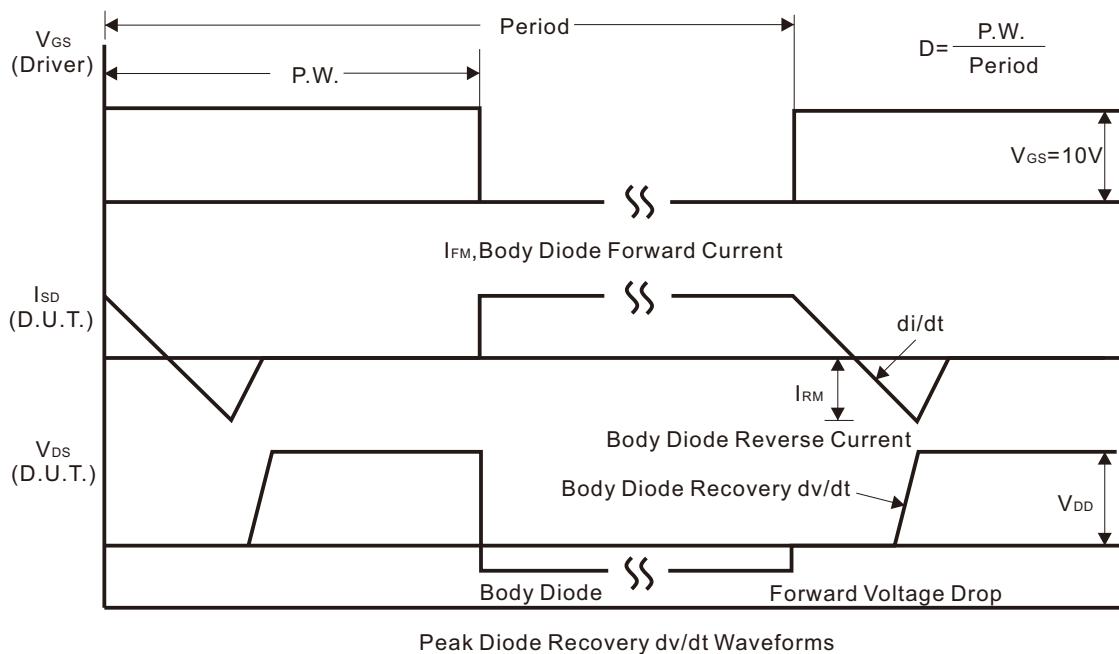
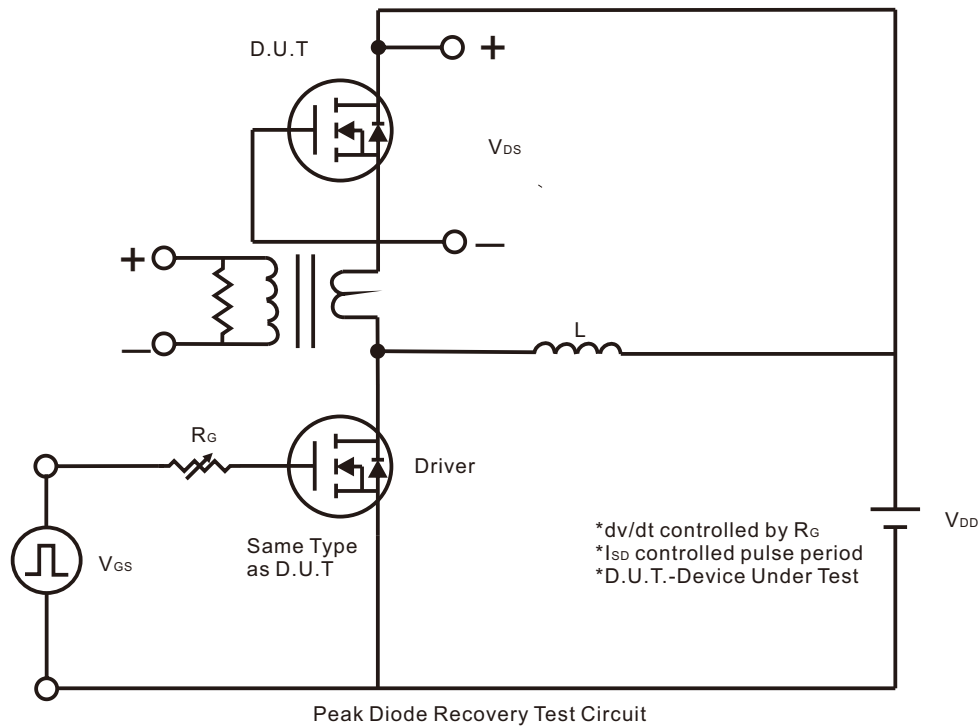
Unclamped Inductive Switching Test Circuit

Unclamped Inductive Switching Waveforms

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Peak Diode Recovery dv/dt Test Circuit & Waveform



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Package Dimension

TO-220F

Unit: mm

