



**TM06N06S**

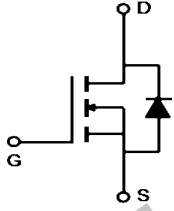
**N-Channel Enhancement Mosfet**

<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Low <math>R_{DS(ON)}</math></li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Load switch</li> <li>• PWM</li> </ul>	<p><b>General Features</b></p> <p><math>V_{DS} = 60V</math> <math>I_D = 6A</math>  <math>R_{DS(ON)} = 27\text{ m}\Omega</math> (typ.) @ <math>V_{GS} = 10V</math></p> <p>100% UIS Tested          100% <math>R_g</math> Tested</p> 
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S:SOP-8L



Marking: 06N06



**Absolute Maximum Ratings** ( $T_A = 25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V$	6	A
$I_D @ T_A = 70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V$	4.5	A
$I_{DM}$	Pulsed Drain Current	18	A
EAS	Single Pulse Avalanche Energy	22	mJ
$I_{AS}$	Avalanche Current	21	A
$P_D @ T_A = 25^\circ\text{C}$	Total Power Dissipation	1.5	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

**Thermal Data**

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	80	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	25	$^\circ\text{C}/\text{W}$



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Electrical Characteristics: ( $T_C=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu A$	60	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=48V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=48V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu A$	1	2	3	V
$R_{DS(on)}$	Static Drain-Source On Resistance <sup>2</sup>	$V_{GS}=10V, I_D=4A$	---	27	36	$m\ \Omega$
		$V_{GS}=4.5V, I_D=3A$	---	35	46	$m\ \Omega$
$G_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=4A$	---	28.3	---	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	1000	---	pF
$C_{oss}$	Output Capacitance		---	60	---	
$C_{rss}$	Reverse Transfer Capacitance		---	45	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=30V, I_D=4A$ $R_G=3.3\ \Omega, V_{GS}=10V$	---	3	---	ns
$t_r$	Rise Time		---	34	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	23	---	ns
$t_f$	Fall Time		---	6	---	ns
$Q_g$	Total Gate Charge	$V_{GS}=10V, V_{DS}=48V,$ $I_D=4A$	---	19	---	nC
$Q_{gs}$	Gate-Source Charge		---	2.6	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	4.1	---	nC
$R_G$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	2.5	---	$\Omega$
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.2	V
$I_S$	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	6	A
$I_{SM}$	Pulsed Source Current		---	---	18	A
$T_{rr}$	Body Diode Reverse Recovery Time	$I_F=4A, di/dt=100A/\mu s,$	---	12.1	---	Ns
$Q_{rr}$	Body Diode Reverse Recovery Charge	$T_J=25^\circ\text{C}$	---	6.7	---	Nc



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Typical Characteristics

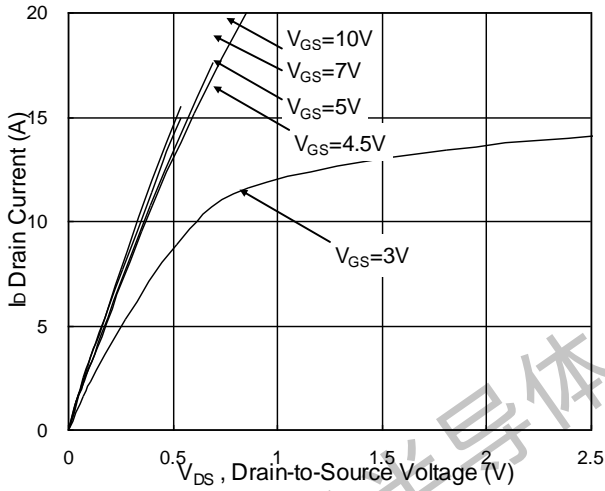


Fig.1 Typical Output Characteristics

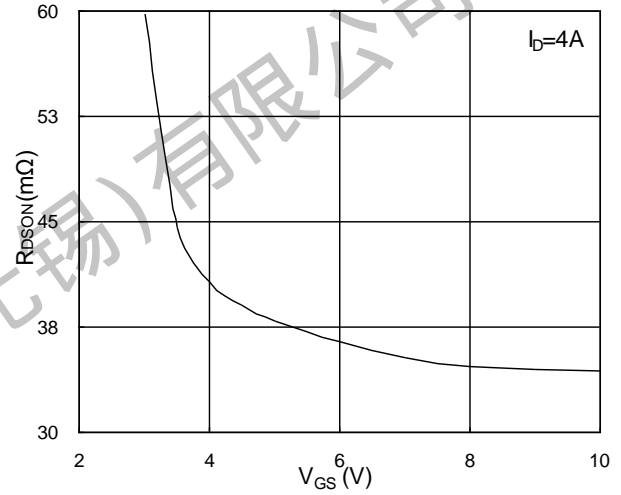


Fig.2 On-Resistance vs. Gate-Source

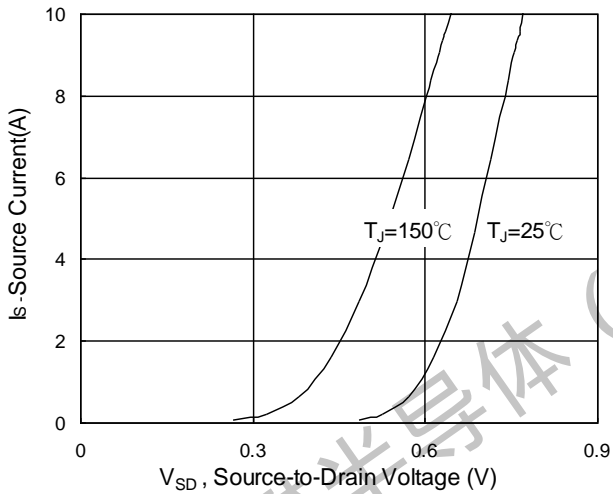


Fig.3 Forward Characteristics Of Reverse

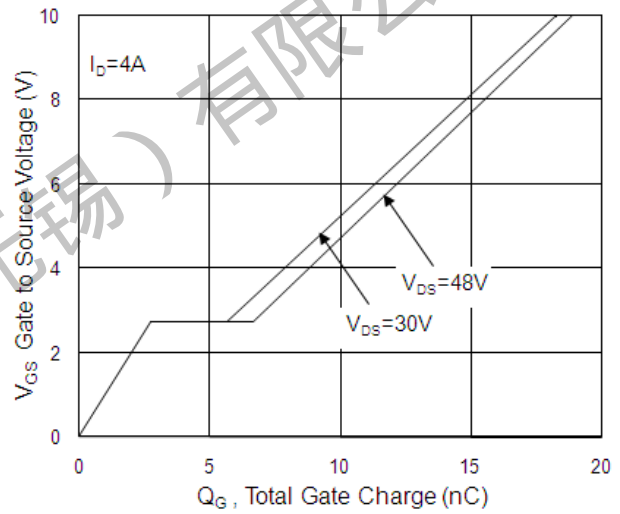


Fig.4 Gate-Charge Characteristics



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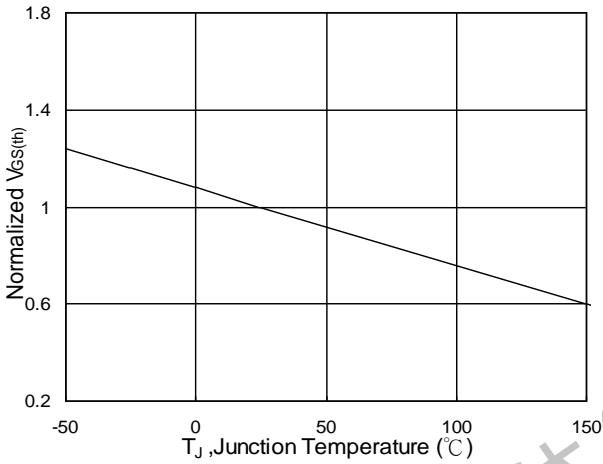


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

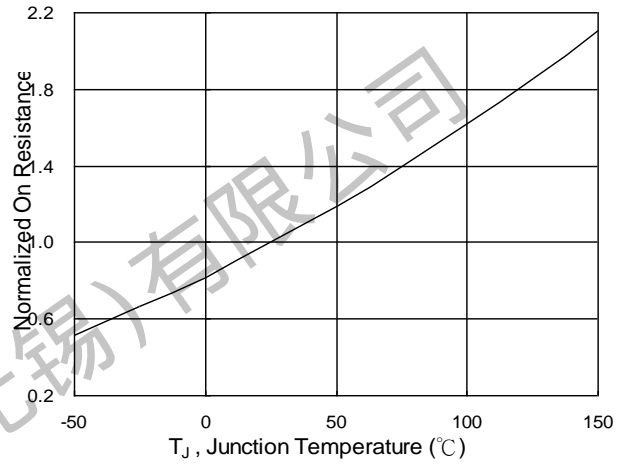


Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$

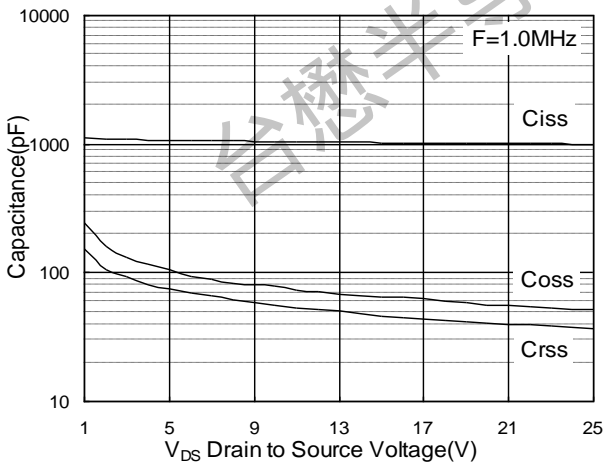


Fig.7 Capacitance

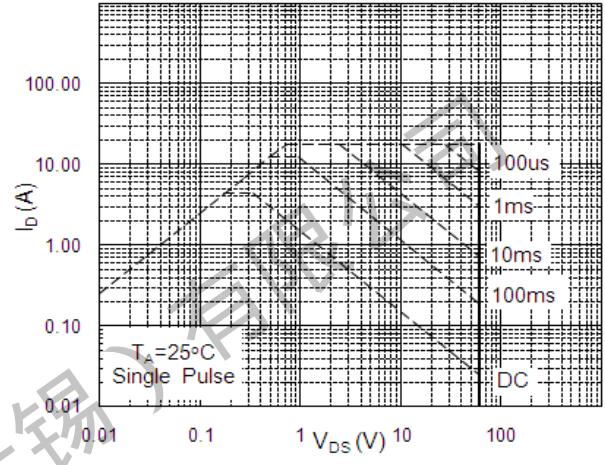


Fig.8 Safe Operating Area

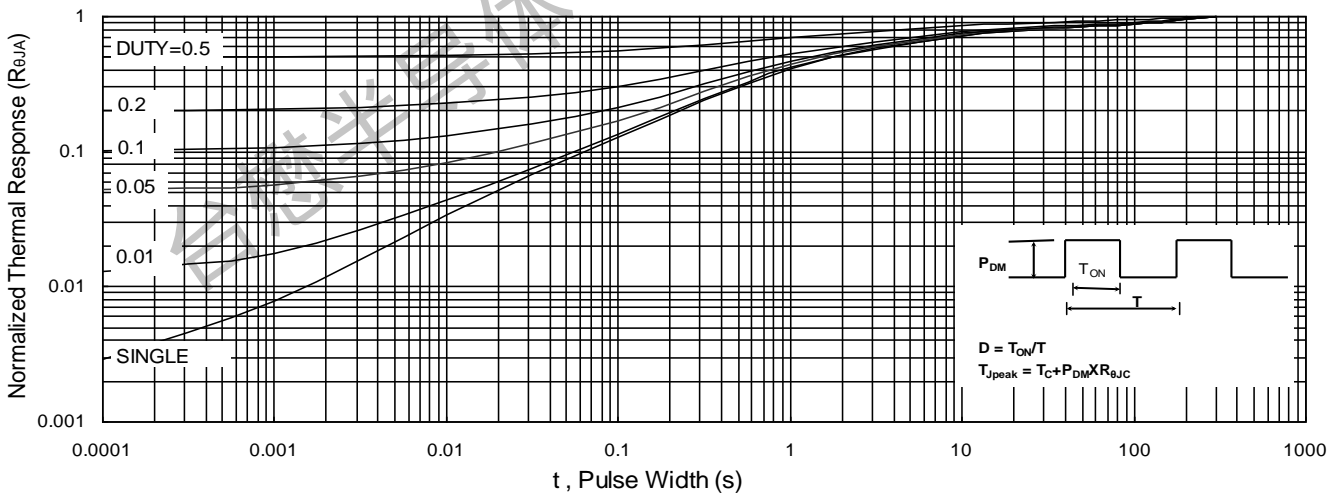


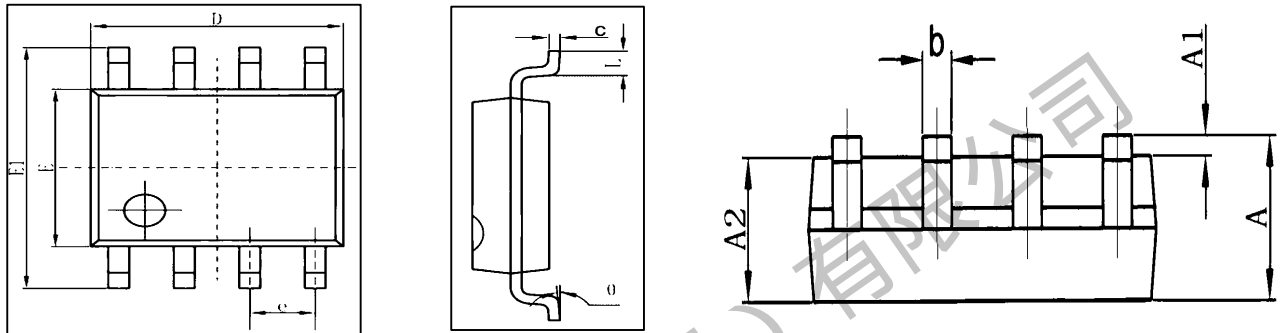
Fig.9 Normalized Maximum Transient Thermal Impedance



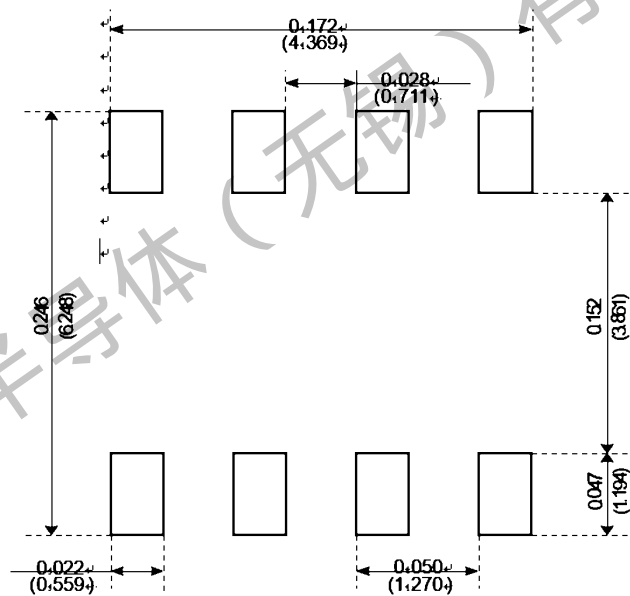
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**Package Mechanical Data:SOP-8L**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

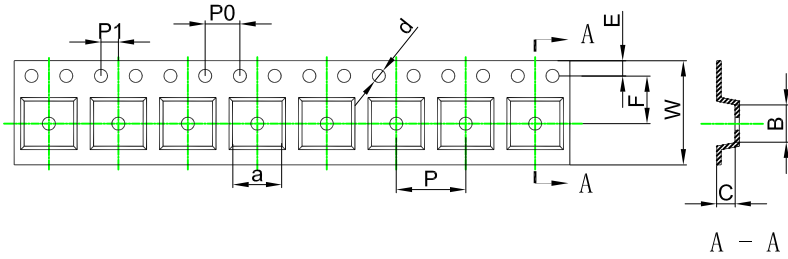


Recommended Minimum Pads

**TM06N06S**

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**SOP-8L Embossed Carrier Tape**

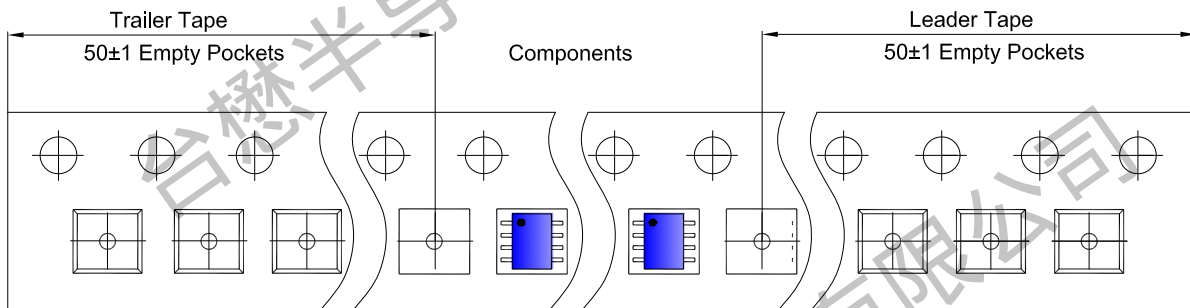


**Packaging Description:**

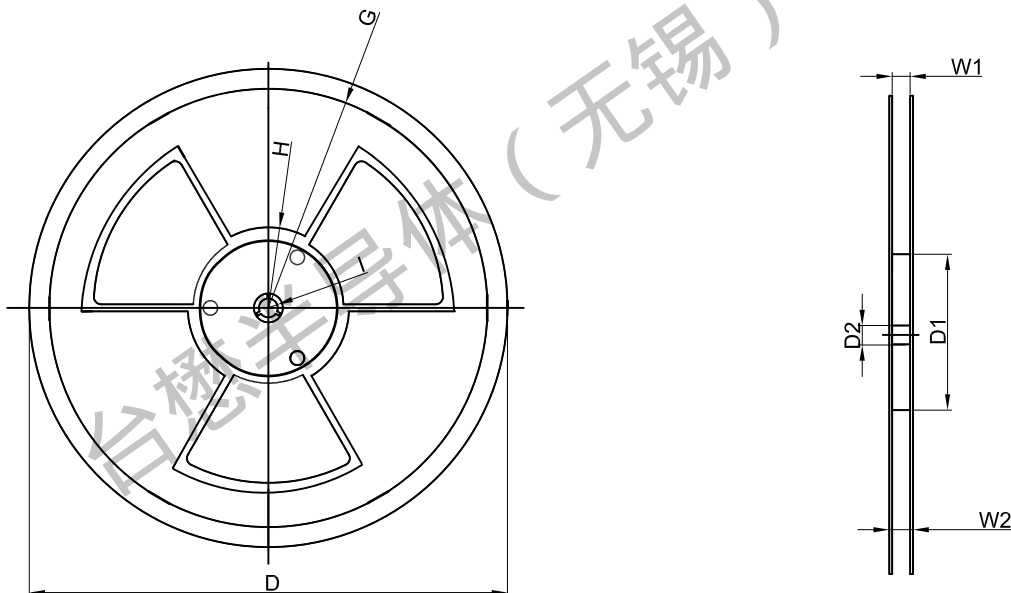
SOP-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 13" or 33cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).  
**ALL DIM IN mm**

Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
SOP-8L	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

**SOP-8L Tape Leader and Trailer**



**SOP-8L Reel**



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
13"Dia	Ø330.00	100.00	13.00	R135.00	R55.00	R6.50	12.00	14.00

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3,000 pcs	13 inch	6,000 pcs	370×355×52	48,000 pcs	400×360×368	

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Revision history:

Date	Rev	Description	Page
2023.05.14	23.05	Original	