

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
60V	7.5mΩ@10V	68A
	10mΩ@4.5V	

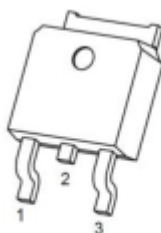
## Feature

- Low  $R_{DS(on)}$  & FOM
- Extremely low switching loss
- Excellent reliability and uniformity
- Fast switching and soft recovery

## Applications

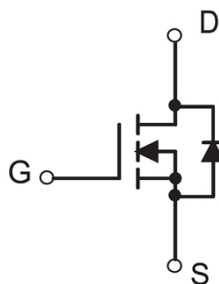
- PD charger
- Motor driver
- Switching voltage regulator
- DC-DC convertor
- Switched mode power supply

## Package

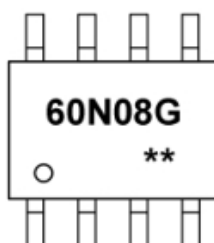


TO-252-2L(G:1 D:2 S:3)

## Circuit diagram



## Marking



60N08G      =Device Code  
\*\*              =Week Code

## Absolute maximum ratings

(T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V <sub>DS</sub>	60	V
Gate-source voltage	V <sub>GS</sub>	±20	V
Continuous drain current <sup>1)</sup> , T <sub>C</sub> =25 °C	I <sub>D</sub>	68	A
Pulsed drain current <sup>2)</sup> , T <sub>C</sub> =25 °C	I <sub>D, pulse</sub>	204	A
Continuous diode forward current <sup>1)</sup> , T <sub>C</sub> =25 °C	I <sub>S</sub>	68	A
Diode pulsed current <sup>2)</sup> , T <sub>C</sub> =25 °C	I <sub>S, pulse</sub>	204	A
Power dissipation <sup>3)</sup> , T <sub>C</sub> =25 °C	P <sub>D</sub>	81	W
Single pulsed avalanche energy <sup>5)</sup>	E <sub>AS</sub>	91	mJ
Thermal resistance, junction-case	R <sub>θJC</sub>	1.54	°C/ W
Thermal resistance, junction-ambient <sup>4)</sup>	R <sub>θJA</sub>	62	°C/ W
Operation and storage temperature	T <sub>STG, T<sub>J</sub></sub>	-55 to 150	°C

## Electrical characteristics

(T<sub>A</sub>=25°C, unless otherwise noted)

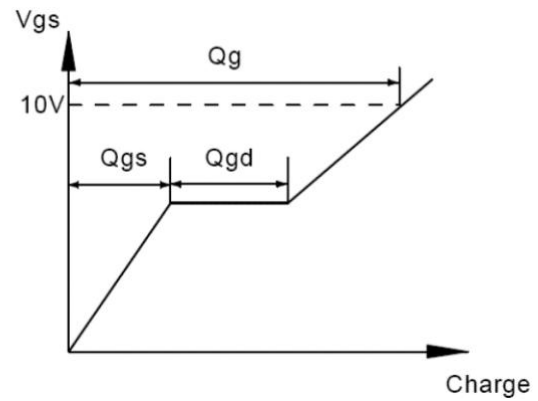
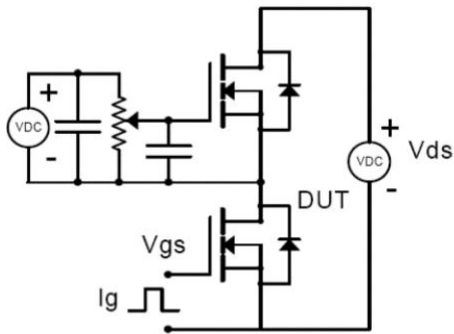
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	60			V
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V			±100	uA
Drain-source leakage current	I <sub>DSS</sub>	V <sub>DS</sub> =60V,V <sub>GS</sub> = 0V			1	uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1		2.5	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		7.5	10	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A		10	13	
Dynamic Characteristics Reverse						
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =50V, f=100KHz		1204		pF
Output capacitance	C <sub>oss</sub>			194.1		
Reverse transfer capacitance	C <sub>rss</sub>			9.9		
Total gate charge	Q <sub>g</sub>	V <sub>GS</sub> =10V ,V <sub>DS</sub> =50V , I <sub>D</sub> =25A		17.9		pF
Gate-source charge	Q <sub>gs</sub>			3.8		
Gate-drain charge	Q <sub>gd</sub>			4.2		
Gate plateau voltage	V <sub>plateau</sub>			4.2		V
Switching Characteristics						
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, R <sub>G</sub> =2Ω, I <sub>D</sub> =25A		23.9		nS
Rise Time	T <sub>r</sub>			4.6		
Turn-Off Delay Time	T <sub>d(off)</sub>			37.8		
Fall Time	t <sub>f</sub>			6.4		
Drain-Source Body Diode Characteristics						
Diode forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V ,I <sub>S</sub> =20A			1.3	V
Reverse recovery time	t <sub>rr</sub>	V <sub>R</sub> =50 V, I <sub>S</sub> =25 A, di/dt=100 A/μs		42.6		ns
Reverse recovery charge	Q <sub>rr</sub>			36.3		nC
Peak reverse recovery current	I <sub>rrm</sub>			1.4		A

### Note :

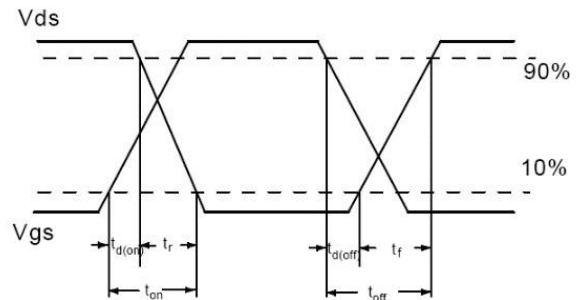
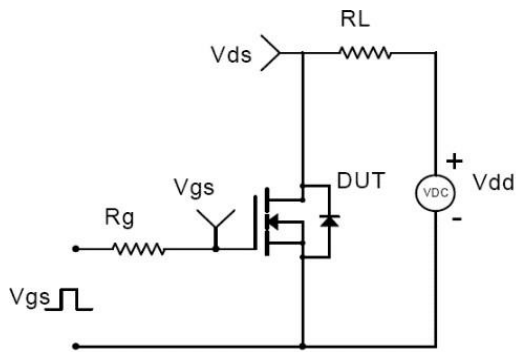
1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. Pd is based on max. junction temperature, using junction-case thermal resistance.
4. The value of RθJA is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T<sub>a</sub>=25 °C.
5. V<sub>DD</sub>=30 V, V<sub>GS</sub>=10 V, L=0.3 mH, starting T<sub>J</sub>=25 °C.

## Test circuits and waveforms

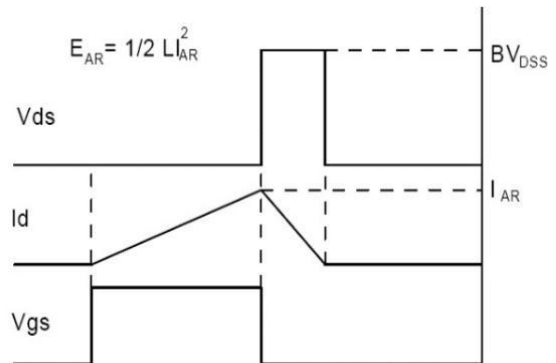
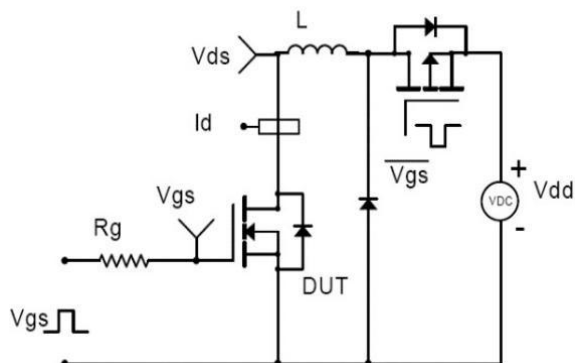
- Gate charge test circuit & waveform



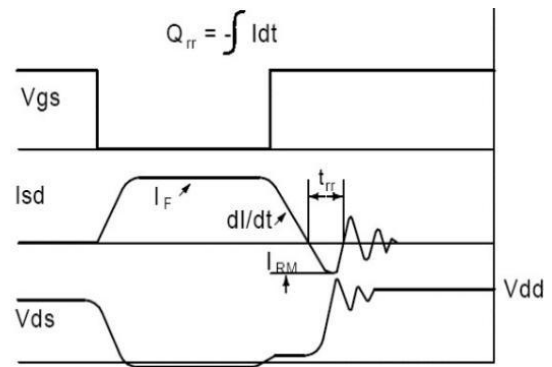
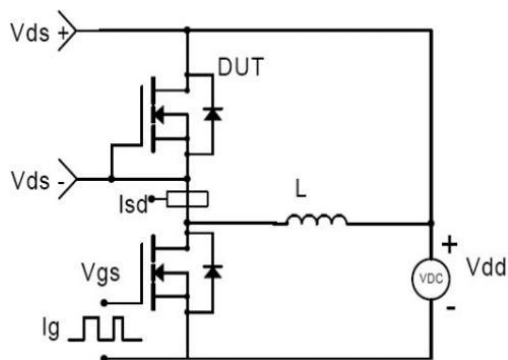
- Switching time test circuit & waveforms



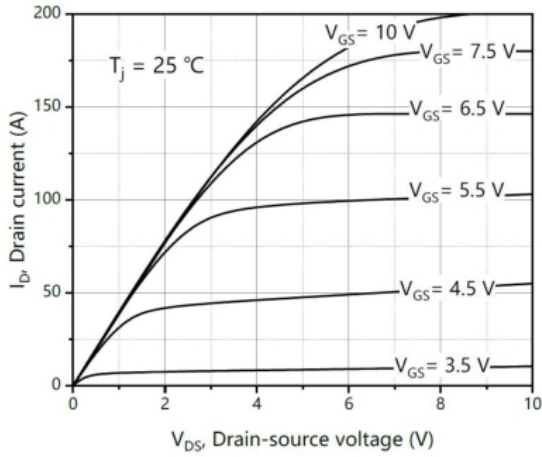
- Unclamped inductive switching (UIS) test circuit & waveforms



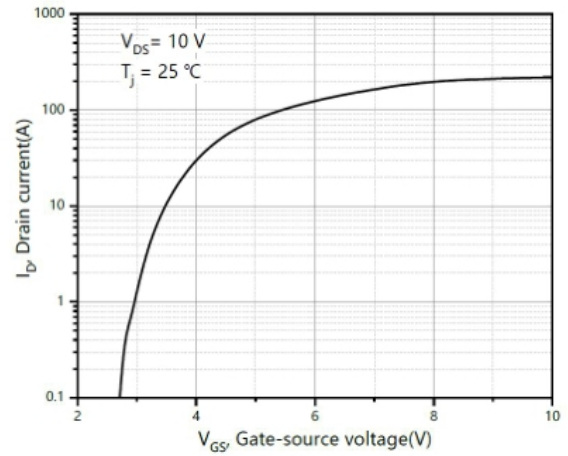
- Diode reverse recovery test circuit & waveforms



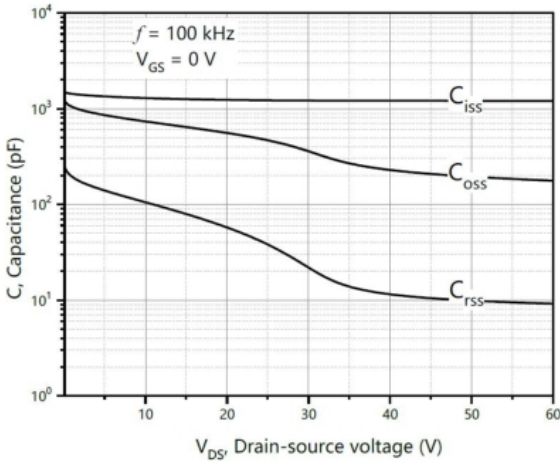
## Typical Characteristics



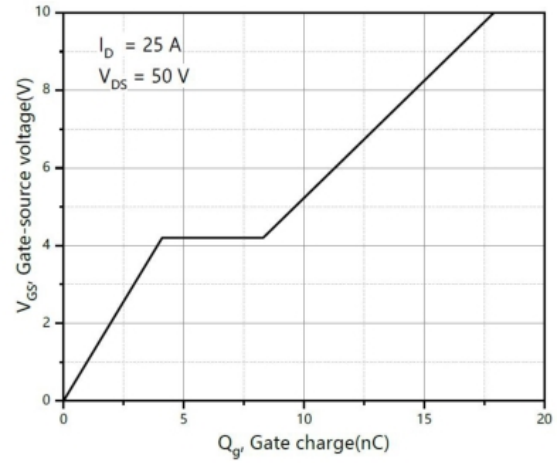
Output characteristics



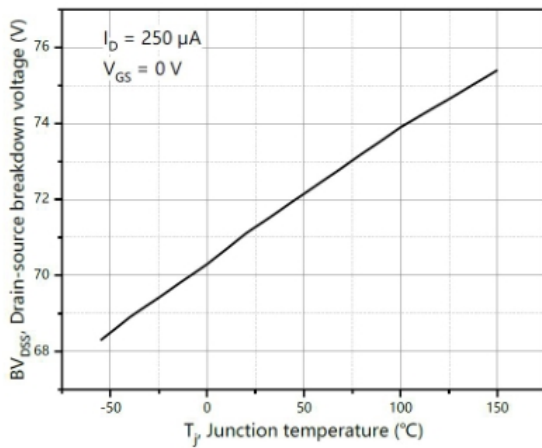
Transfer characteristics



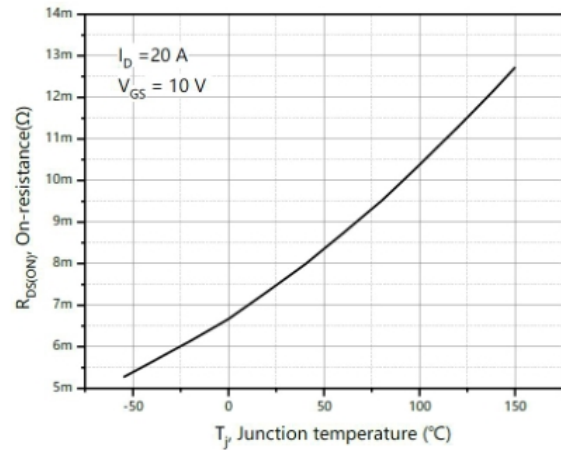
Capacitances



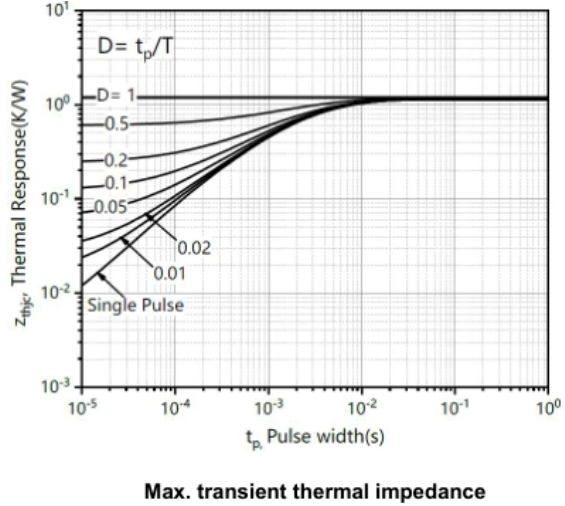
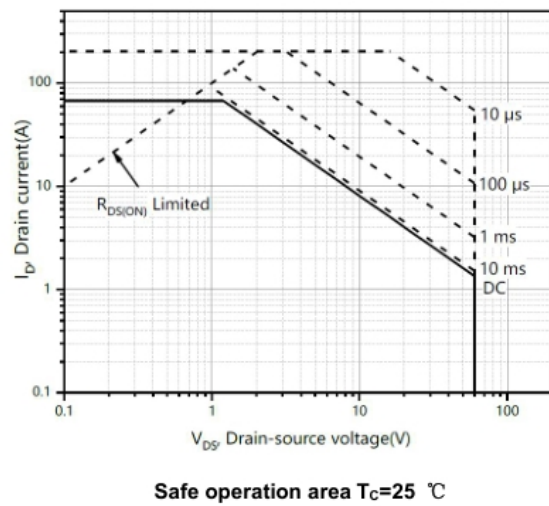
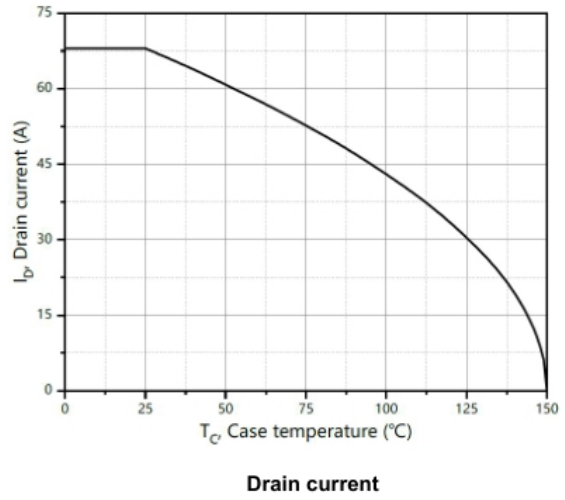
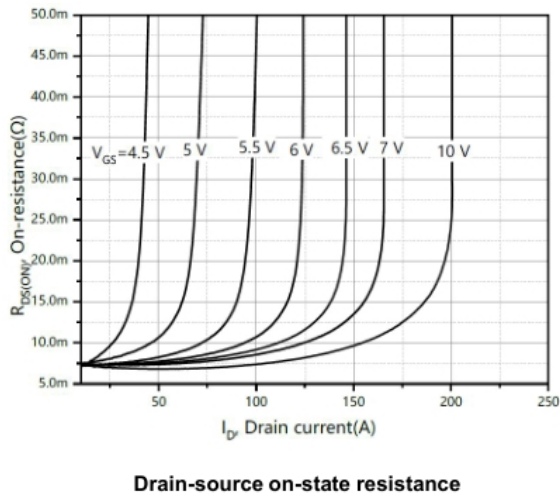
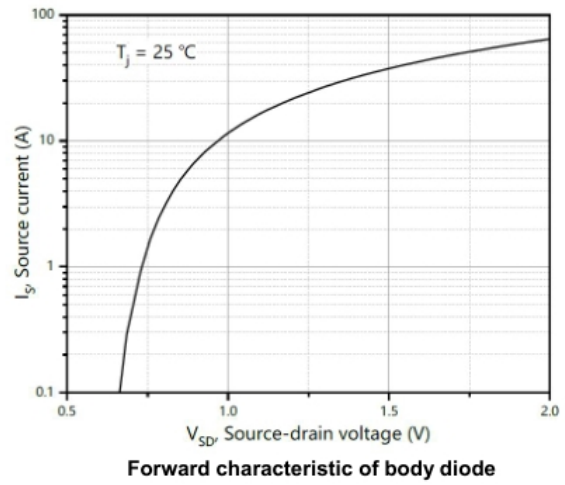
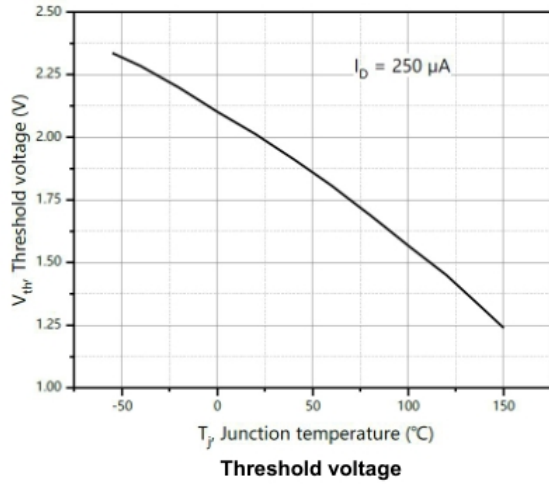
Gate charge



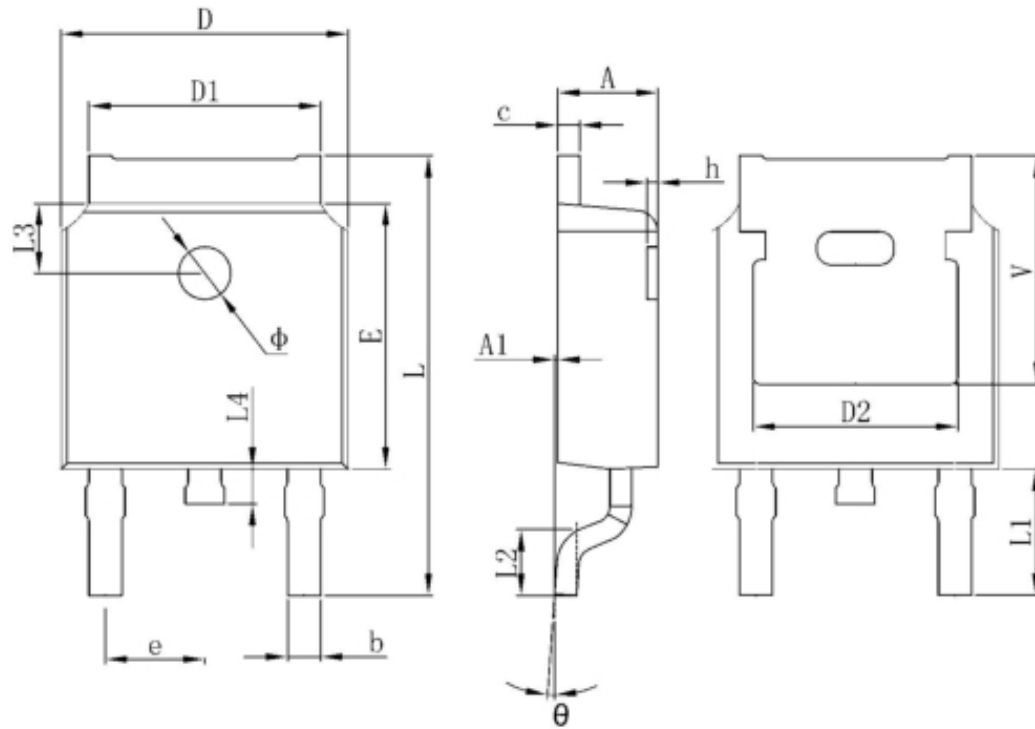
Drain-source breakdown voltage



Drain-source on-state resistance



## TO-252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	