



-20V/-45A P-Channel Junction Power MOSFET

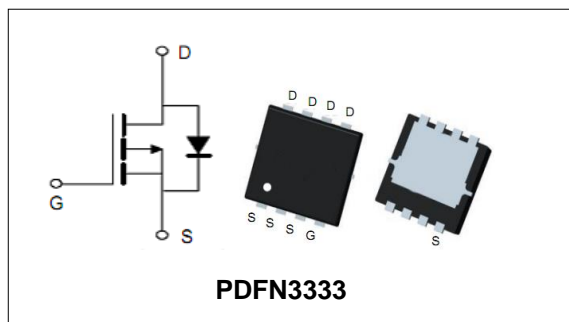
Features

- New technology for high voltage device.
- Low on-resistance and low conduction losses
- Ultra Low Gate Charge cause lower driving requirements

Applications

- High Side Load Switch
- Battery Switch
- Optimized for Power Management Applications for Portable Products, such as Aeromodelling, Power bank, Brushless motor, Main board , and Others

BVDSS	-30	V
ID	-45	A
RDSON@VGS=-4.5V	5	mΩ
RDSON@VGS=-2.5V	8.8	mΩ
RDSON@VGS=-1.8V	9	mΩ



Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PTQ45P02	PDFN3333	PTQ45P02	13inch	5000PCS	50000PCS

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
Common Ratings (TC=25°C Unless Otherwise Noted)				
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	-20	V	
V_{GS}	Gate-Source Voltage	±12	V	
T_J	Maximum Junction Temperature	150	°C	
T_{STG}	Storage Temperature Range	-55 to 150	°C	
I_S	Diode Continuous Forward Current	TC =25°C	-45	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested (Silicon Limit) (Note1)	TC =25°C	-180	A
I_D	Continuous Drain current	TC =25°C	-45	A
P_D	Maximum Power Dissipation	TA =25°C	3.5	W
$R_{θJa}$	Thermal Resistance Junction-to-Ambient (Note2)		36	°C/W

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Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain- Source Breakdown Voltage	VGS=0V ID=-250μA	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain current	VDS=-20V,VGS=0V	--	--	-1	μA
I _{GSS}	Gate-Body Leakage Current	VGS=±12V,VDS=0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.4	--	-1.0	V
R _{DS(ON)}	Drain-Source On-State Resistance (Note3)	VGS=-4.5V, ID=-20A	--	5	8	mΩ
		VGS=-2.5V, ID=-15A	--	8.8	10	
		VGS=-1.8V, ID=-12A	--	9	16	
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note4)						
C _{iss}	Input Capacitance	VDS=-10V, VGS=0V, F=1MHz	--	3500	--	pF
C _{oss}	Output Capacitance		--	577	--	pF
C _{rss}	Reverse Transfer Capacitance		--	445	--	pF
Q _g	Total Gate Charge	VDS=-10V, ID=-20A, VGS=-4.5V	--	55	--	nC
Q _{gs}	Gate-Source Charge		--	10	--	nC
Q _{gd}	Gate-Drain Charge		--	15	--	nC
Switching Characteristics (Note4)						
t _{d(on)}	Turn-on Delay Time	VDD=-10V, RL=0.5Ω, VGS=-4.5V RG=3Ω	--	18	--	nS
t _r	Turn-on Rise Time		--	42	--	nS
t _{d(off)}	Turn-off Delay Time		--	85	--	nS
t _f	Turn-off Fall Time		--	23	--	nS
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	IS=-30A,VGS=0V	--	-0.8	-1.2	V
t _{rr}	Reverse Recovery Time	ISD=-10A dI/dt=100A/us	--	47	--	nS
Q _{rr}	Reverse Recovery Charge		--	53	--	nC

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.



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Typical Characteristics

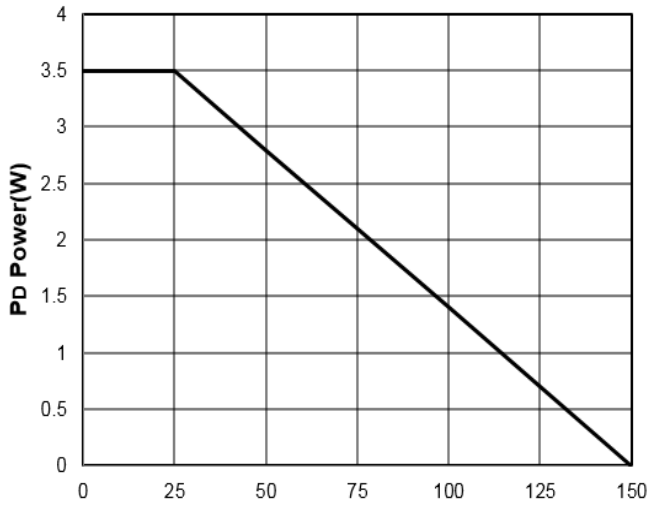


Figure1: T_j Junction Temperature (°C)

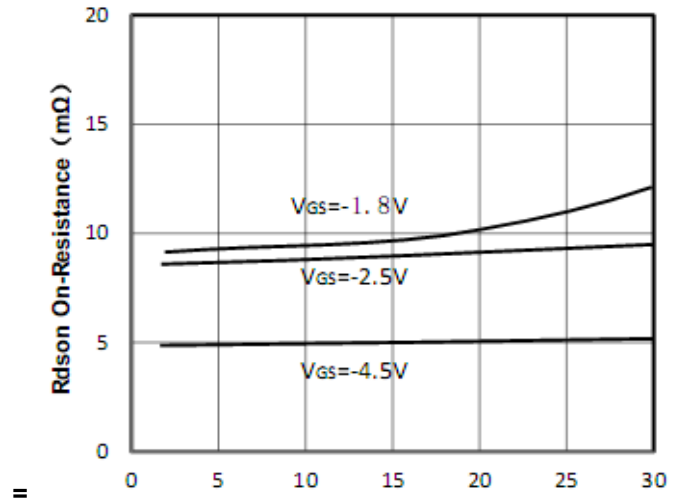


Figure2: -I_d Drain Current (A)

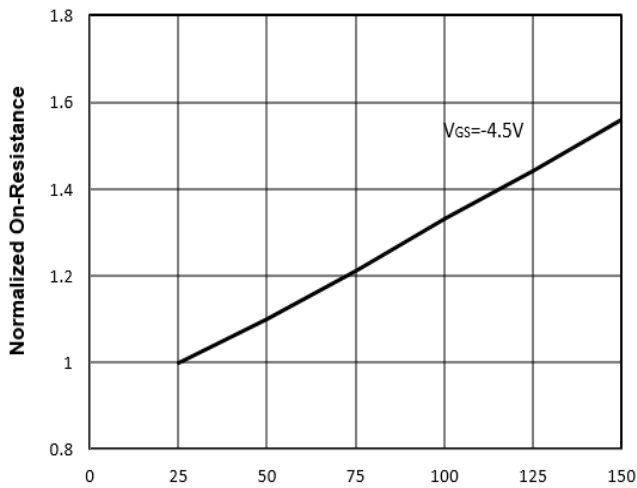


Figure3: T_j Junction Temperature (°C)

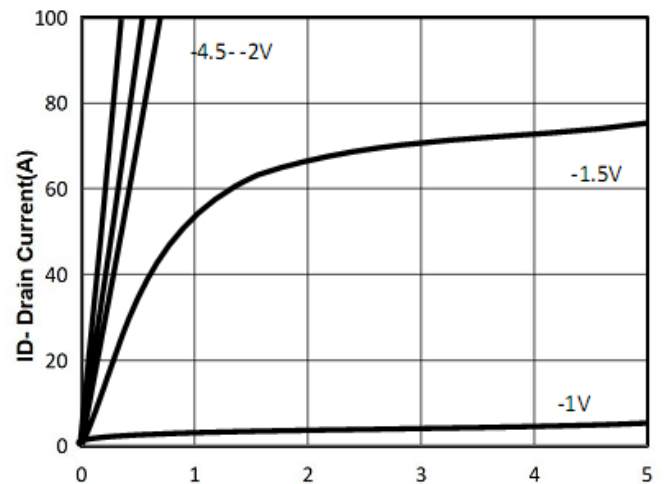


Figure4: -V_{ds} Drain-Source Voltage (V)

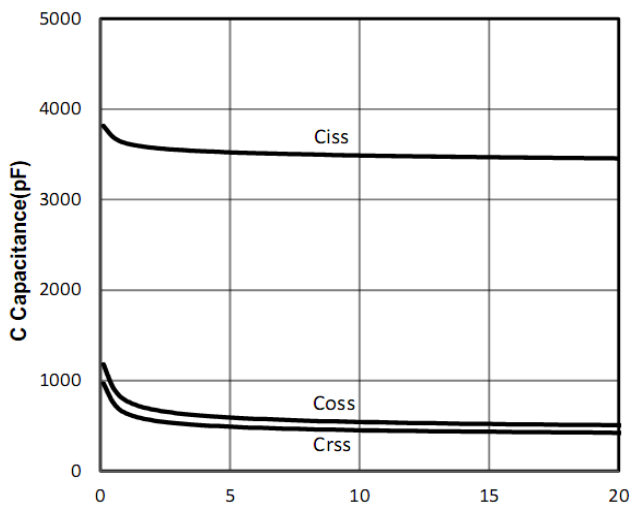


Figure5: -V_{ds} Drain-Source Voltage (V)

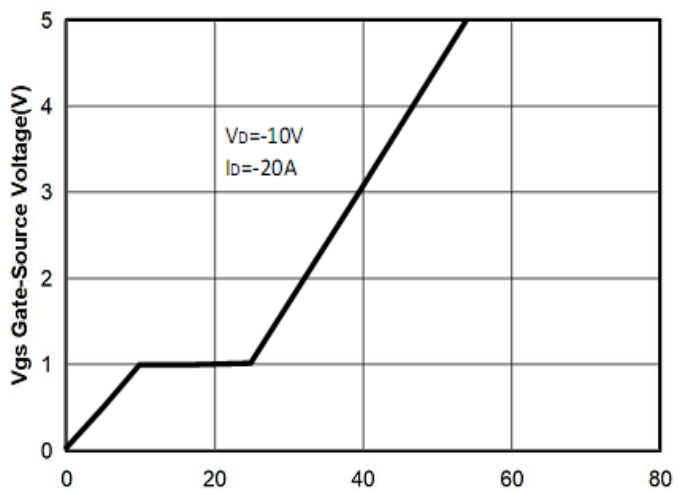


Figure6: Q_g Gate Charge (nC)



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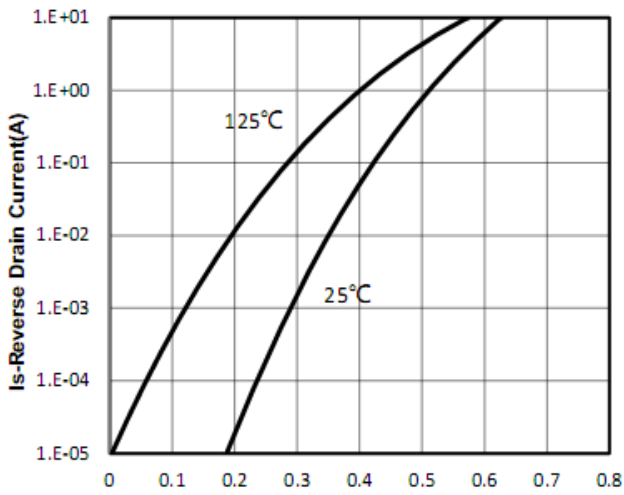


Figure7: -Vsd Source-Drain Voltage (V)

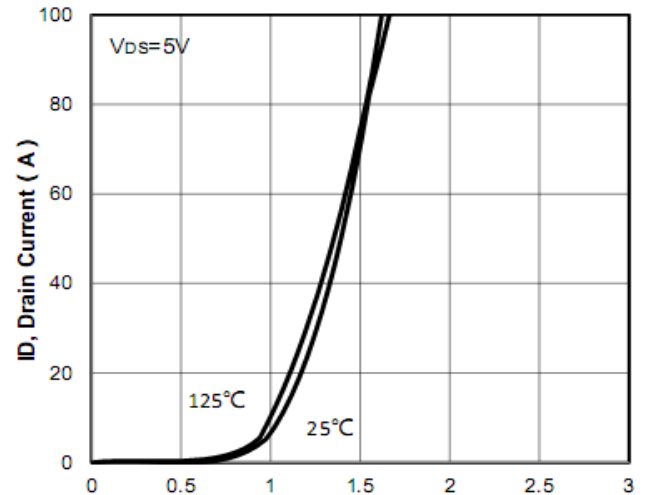


Figure8: -Vgs Gate-Source Voltage (V)

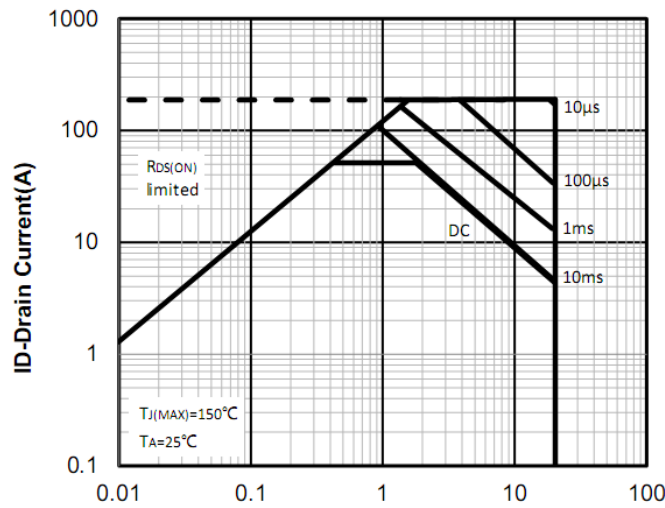


Figure9: -VDS Drain -Source Voltage (V)

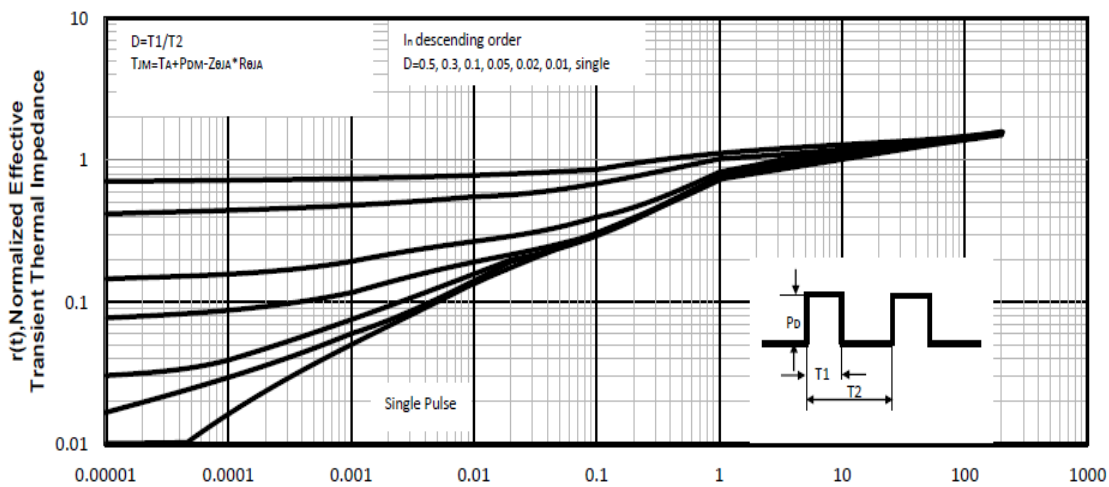


Figure10: Square Wave Pulse Duration (sec)

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Test Circuit and Waveform:

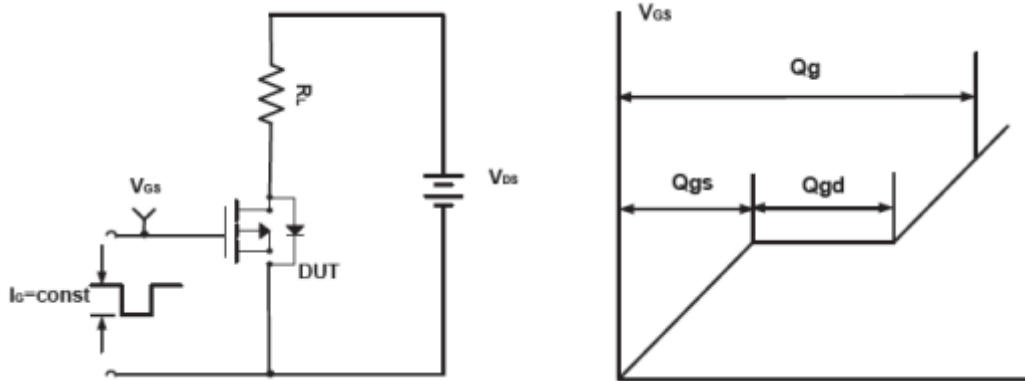


Figure A Gate Charge Test Circuit & Waveforms

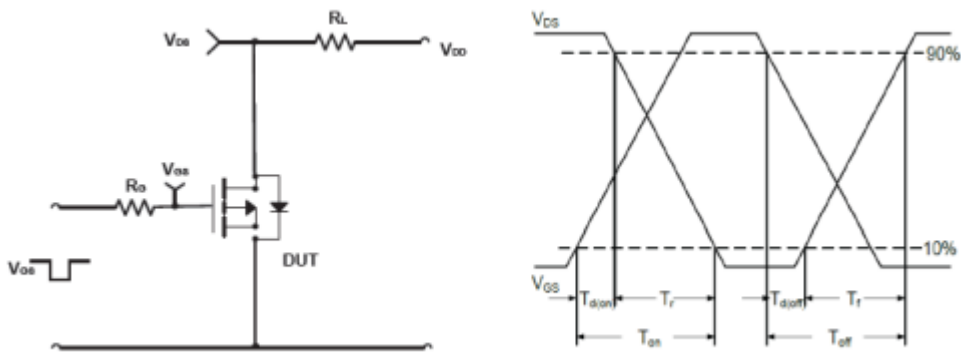


Figure B Switching Test Circuit & Waveforms

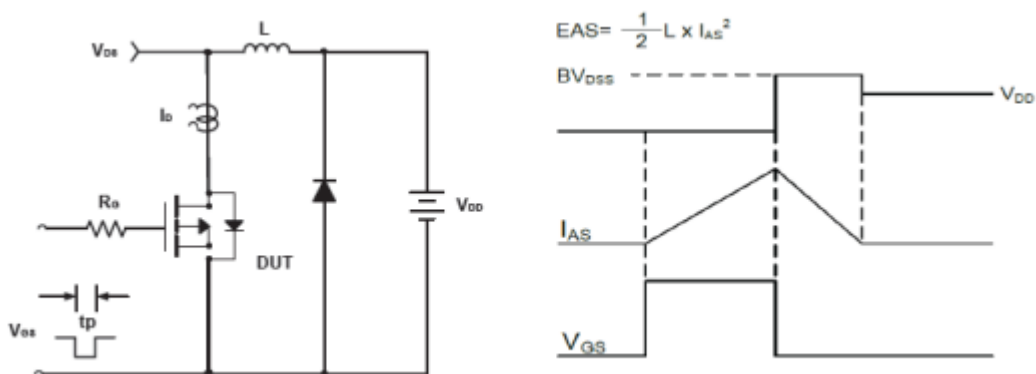
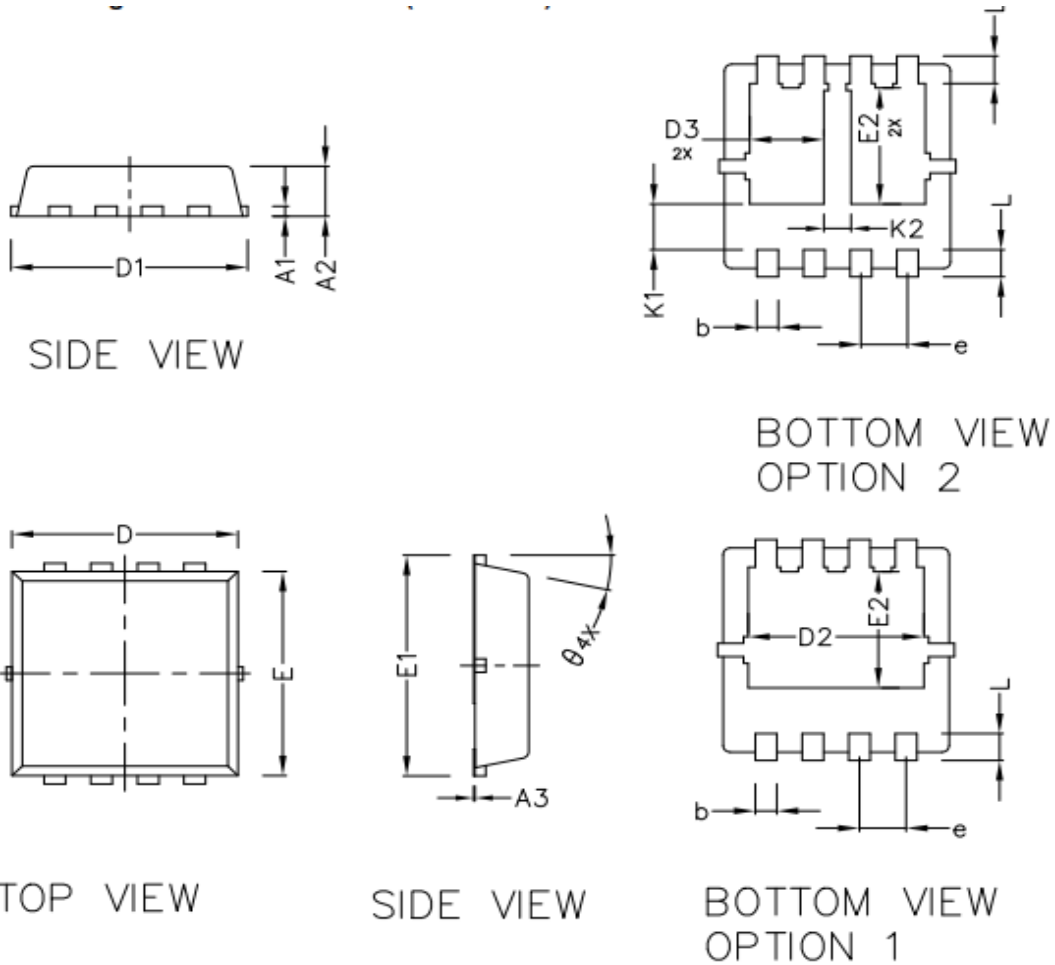


Figure C Unclamped Inductive Switching Circuit & Waveforms



PDFN3333 Package Outline Dimensions (Units: mm)



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.152 BSC		
A2	0.650	0.750	0.850
A3	0.005	-	0.020
b	0.250	0.300	0.350
D	3.050	3.150	3.250
D1	3.200	3.300	3.400
D2	2.350	2.450	2.550
D3	0.935	1.035	1.135
E1	3.150	3.300	3.450
E	2.950	3.050	3.150
E2	1.635	1.735	1.835
e	0.650 TYPE		
L	0.300	0.400	0.500
θ	12° TYPE		
K1	0.680 REF		
K2	0.380 REF		
L1	0.410 REF		