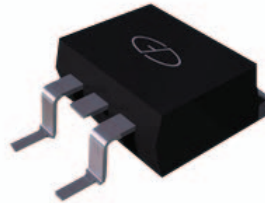
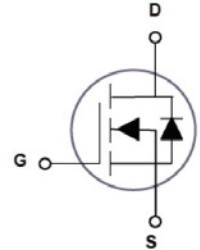


Main Product Characteristics

V_{DS}	250V
$R_{DS(ON)(MAX.)}$	18.5m Ω
I_D	80A



TO-263 (D²PAK)



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The SSFT25N80 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	250	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	80	A
Drain Current-Continuous(T _C =100°C)	$I_D(100^\circ\text{C})$	56.6	A
Pulsed Drain Current	I_{DM}	320	A
Maximum Power Dissipation	P_D	300	W
Derating Factor		2	W/°C
Single Pulse Avalanche Energy ⁵	E_{AS}	1200	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To +175	°C
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	0.5	°C/W

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	250	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=250V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics³						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	-	4.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=40A$	-	16	18.5	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=40A$	70	-	-	S
Dynamic Characteristics⁴						
Input Capacitance	C_{iss}	$V_{DS}=125V, V_{GS}=0V, F=1.0MHz$	-	5400	-	PF
Output Capacitance	C_{oss}		-	329	-	
Reverse Transfer Capacitance	C_{rss}		-	12	-	
Switching Characteristics⁴						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=125V, I_D=40A, V_{GS}=10V, R_G=4.7\Omega$	-	18	-	nS
Turn-on Rise Time	t_r		-	26	-	
Turn-Off Delay Time	$t_{d(off)}$		-	41	-	
Turn-Off Fall Time	t_f		-	11	-	
Total Gate Charge	Q_g	$V_{DS}=125V, I_D=40A, V_{GS}=10V$	-	76.7	-	nC
Gate-Source Charge	Q_{gs}		-	22.7	-	
Gate-Drain Charge	Q_{gd}		-	20	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=80A$	-	-	1.2	V
Diode Forward Current ²	I_S		-	-	80	A
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ\text{C}, I_F = 40A, di/dt=100A/\mu S^3$	-	140	-	nS
Reverse Recovery Charge	Q_{rr}		-	600	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu S$, Duty Cycle $\leq 2\%$.
4. Essentially independent of operating temperature.
5. E_{AS} condition: $T_J=25^\circ\text{C}, V_{DD}=50V, V_G=10V, L=0.5mH, R_g=25\Omega$

Test Circuits

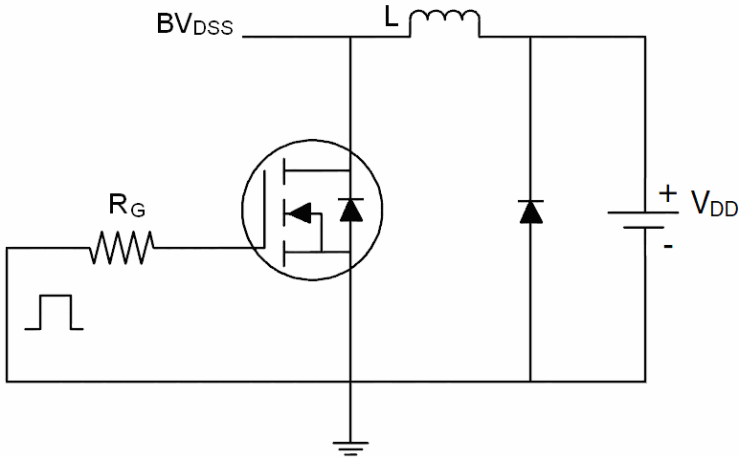


Figure 1. E_{AS} Test Circuit

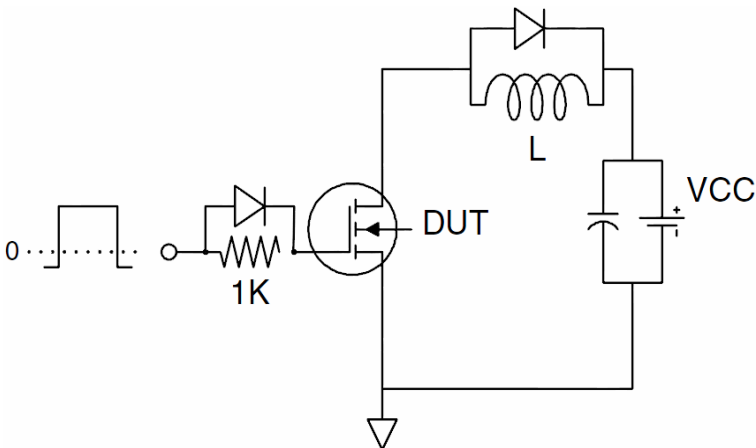


Figure 2. Gate Charge Test Circuit

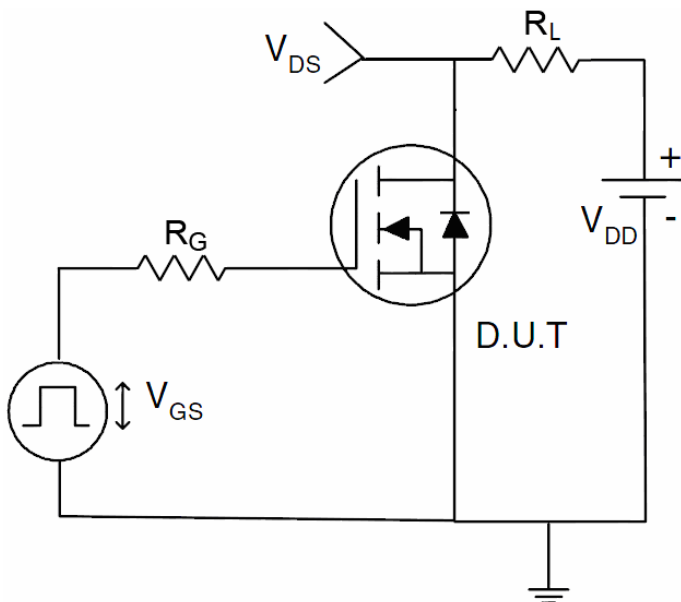


Figure 3. Switch Time Test Circuit

Typical Electrical and Thermal Characteristic Curves

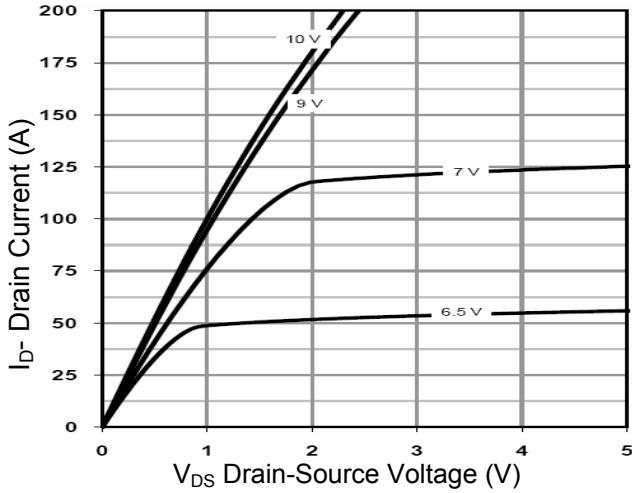


Figure 4. Output Characteristics

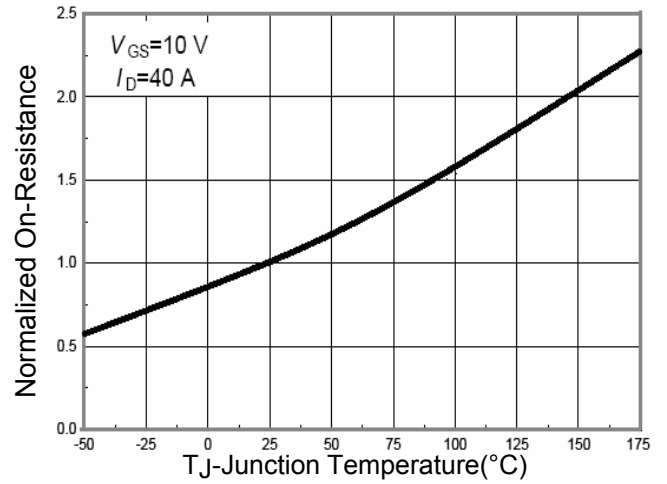


Figure 5. $R_{DS(ON)}$ -Junction Temperature

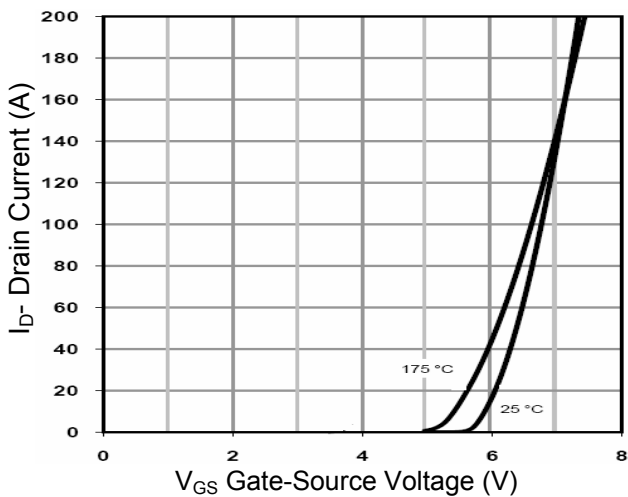


Figure 6. Transfer Characteristics

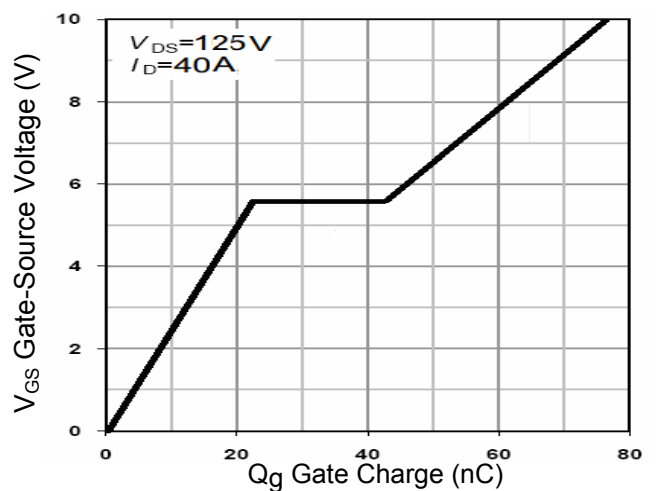


Figure 7. Gate Charge

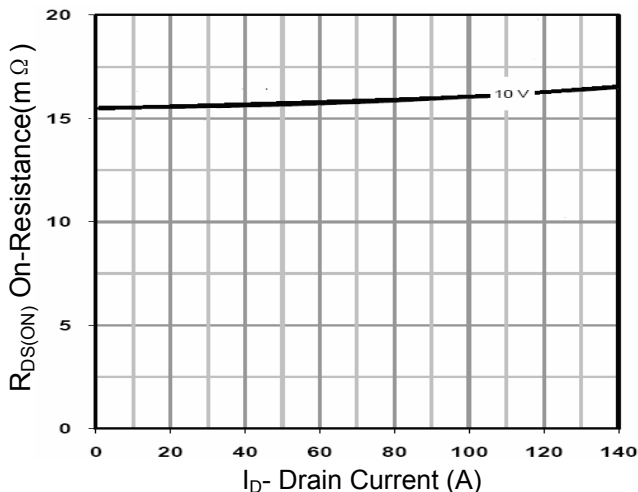


Figure 8. $R_{DS(ON)}$ - Drain Current

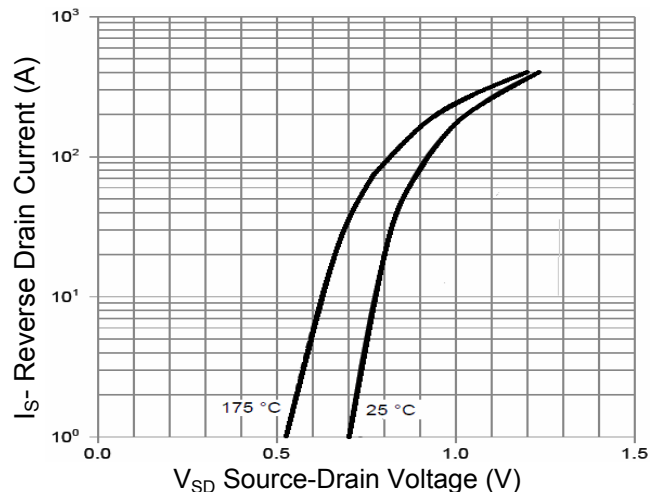


Figure 9. Source- Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

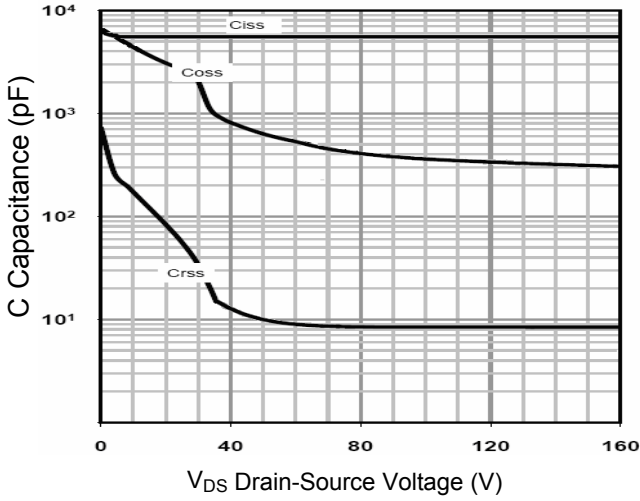


Figure 10. Capacitance vs V_{DS}

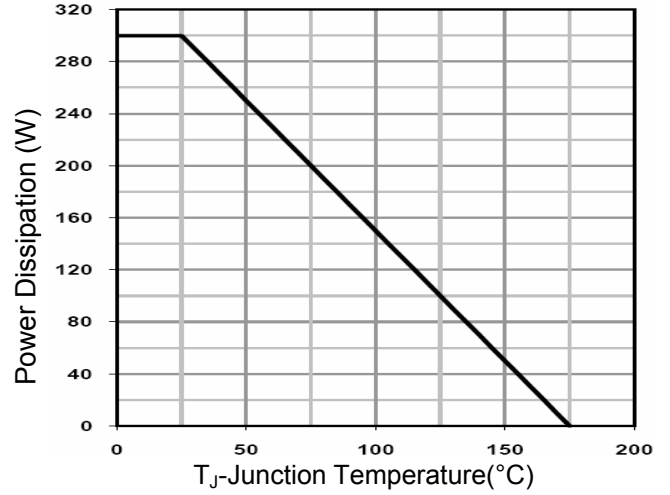


Figure 11. Power De-rating

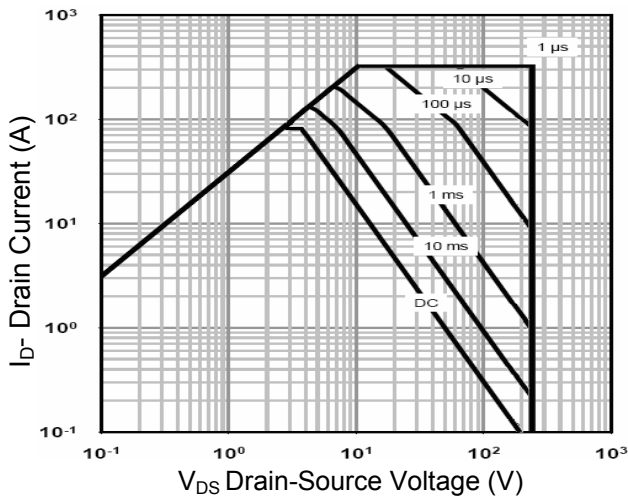


Figure 12. Safe Operation Area

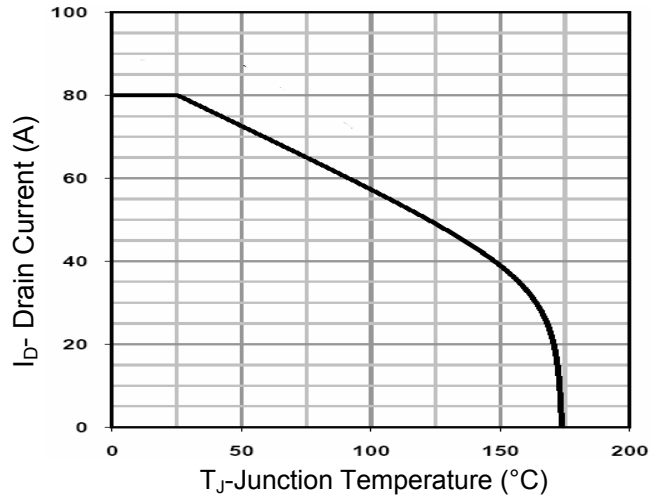


Figure 13. Current De-rating

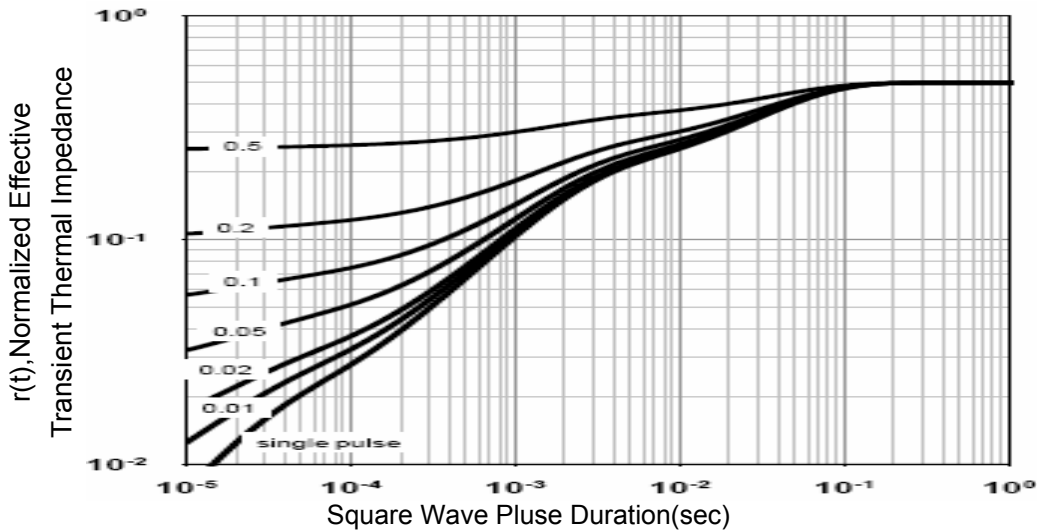
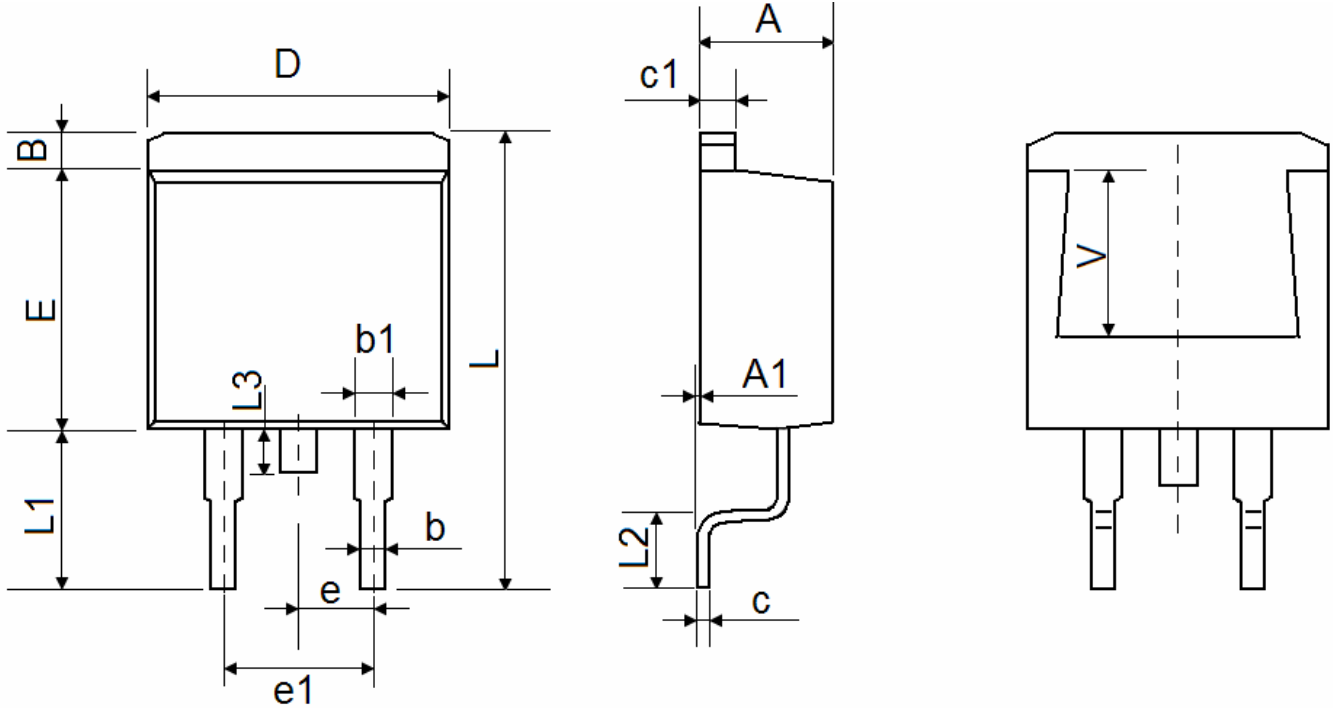


Figure 14. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions

TO-263 (D²PAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.170	1.370	0.046	0.054
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	15.050	15.450	0.593	0.608
L1	5.080	5.480	0.200	0.216
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
V	5.600 REF		0.220 REF	