工业型号	公司型号	浩海命名	H	封装标识	包装方式	每管数量	每盒数量	每箱数量
FQP90N71C FQPF90N71C	H90N71P H90N71F	90N71	HAOHAI	P: TO-220AB F: TO-220FP	条管装 盒装箱装	50Pcs	1000Pcs	5000Pcs

The H90N71 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

I_D=90A
BV_{DSS}=71V
$R_{DS(on)}$=0.59Ω

■GENERAL FEATURES
I_D=90A, V_{DS}=71V
$R_{DS(ON)}$<6.8mΩ @ V_{GS}=10V (Typ: 5.9mΩ)
Special process technology for high ESD capability
High density cell design for ultra low Rdson
Fully characterized Avalanche voltage and current
Good stability and uniformity with high EAS
Excellent package for good heat dissipation

■Application
Power switching application
Hard Switched and High Frequency Circuits
Uninterruptible Power Supply
100% UIS TESTED !　　100% ΔVds TESTED !
Package: TO-220AB & TO-220F

■应用范围
开关电源、LCD电源、LED驱动电源、机箱电源、UPS电源、大功率捕鱼器
各种充电器、电子整流器、电子变压器、逆变器、控制器、转换器、
风扇控制板、以及电源适配器、汽车稳压器等线性放大和功率开关电路

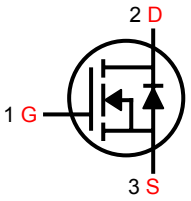
■封装形式: TO-220AB（半塑封）、TO-220F（全塑封）
可代替其它工业型号：IRF3205

H90N71 Series Pin Assignment

3-Lead Plastic TO-220AB
Package Code: P
Pin 1: Gate
Pin 2 & Tab: Drain
Pin 3: Source

3-Lead Plastic TO-220FP
Package Code: F
Pin 1: Gate
Pin 2: Drain
Pin 3: Source

Series Symbol:



■ Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	71	V
Gate-Source Voltage	V_{GS}	±20	
Drain Current-Continuous	I_D	90	A
Drain Current-Continuous (T_C=100℃)		63	
Pulsed Drain Current	I_{DM}	320	
Maximum Power Dissipation	P_D	170	W
Derating factor		1.13	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	550	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~+175	℃

■ Thermal Characteristic

Parameter	Symbol	Limit	Unit
Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta Jc}$	0.88	℃/W

■ Electrical Characteristics (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
■ Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	71	74	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=71V, V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	--	--	±100	nA
■ On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=40A	--	5.9	6.8	mΩ
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=40A	--	50	--	S
■ On Characteristics (Note 4)						
Gate resistance	R_g	V_{DS}=0V,V_{GS}=0V,F=1MHz	--	0.63	--	Ω
Input Capacitance	C_{lss}	V_{DS}=15V V_{GS}=0V F=1.0MHz	--	4871	--	pF
Output Capacitance	C_{oss}		--	630.6	--	
Reverse Transfer Capacitance	C_{rss}		--	410.3	--	
■ Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V I_D=42A V_{GS}=10V R_{GEN}=10Ω	--	36.1	--	nS
Turn-on Rise Time	t_r		--	54.3	--	
Turn-Off Delay Time	$t_{d(off)}$		--	85.2	--	
Turn-Off Fall Time	t_f		--	37.3	--	
Total Gate Charge	Q_g	V_{DS}=48V I_D=84A V_{GS}=10V	--	85.7	--	nC
Gate-Source Charge	Q_{gS}		--	23.2	--	
Gate-Drain Charge	Q_{gd}		--	31.2	--	
■ Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V, I_S=20A	--	--	1.2	V
Diode Forward Current (Note 2)	I_S	--	--	--	90	A
Reverse Recovery Time	t_{rr}	T_J=25℃, I_F=84A di/dt=100A/μs (Note3)	--	88.3	--	nS
Reverse Recovery Charge	Q_{rr}		--	65.9	--	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

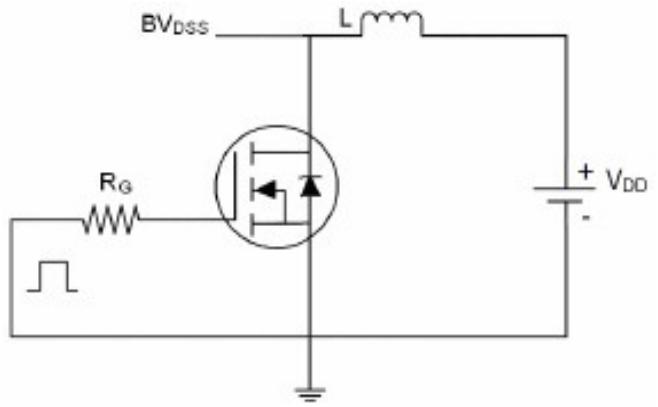
Notes:

1、Repetitive Rating: Pulse width limited by maximum junction temperature 。 2、Surface Mounted on FR4 Board, t ≤10sec； 3、Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤2%

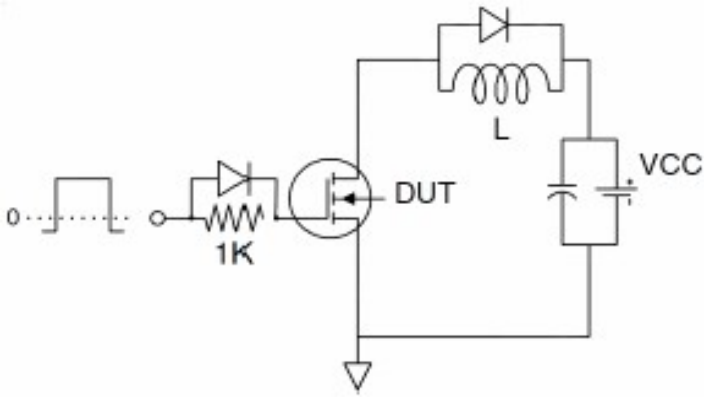
4、Guaranteed by design, not subject to production； 5、EAS condition: T_j=25 ℃, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25Ω

■ Test circuit

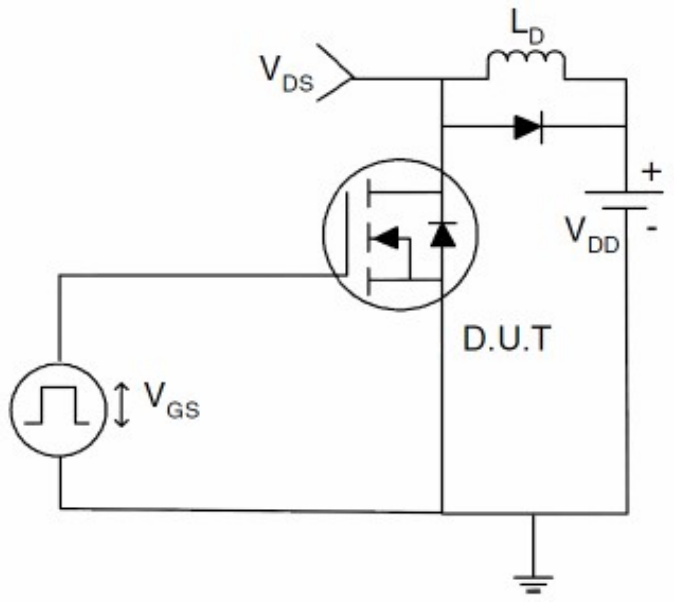
1: EAS test Circuits



2: Gate charge test Circuit



3: Switch Time Test Circuit



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Fig-1: Output Characteristics

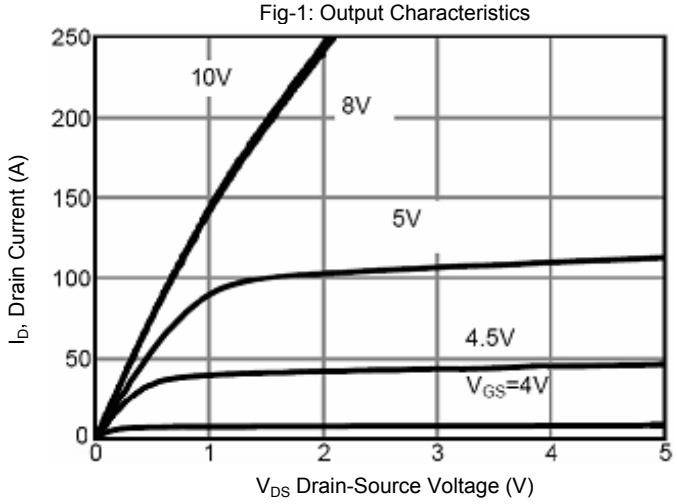


Fig-2: Transfer Characteristics

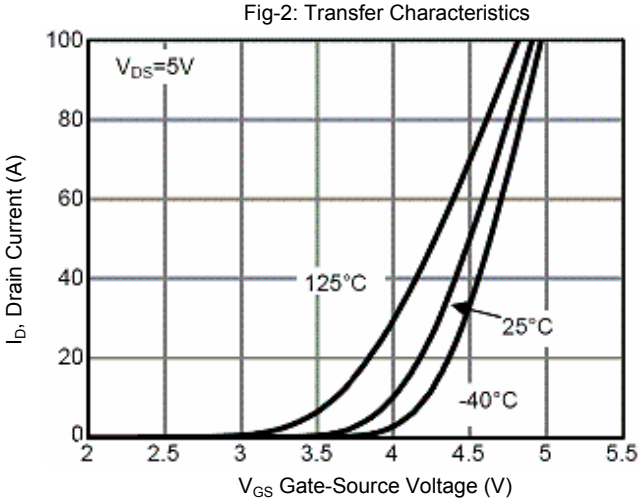


Fig-3: Rdson- Drain Current

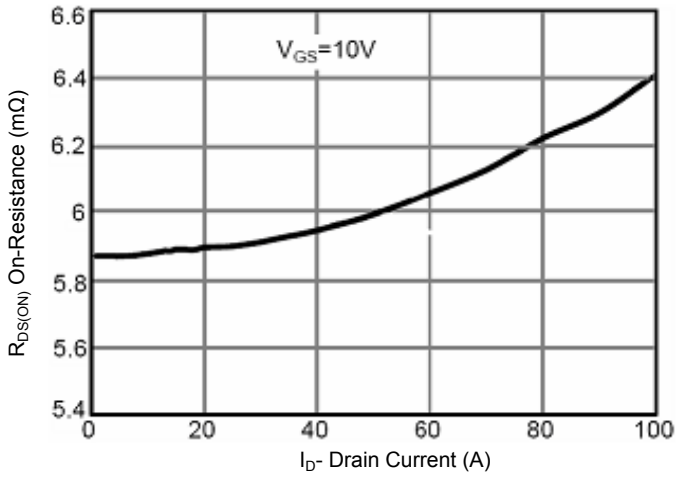


Fig-4: $R_{DS(ON)}$-JunctionTemperature

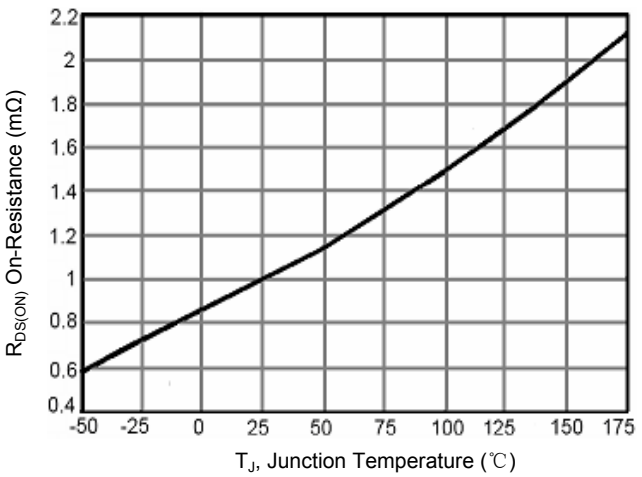


Fig-5: Gate Charge

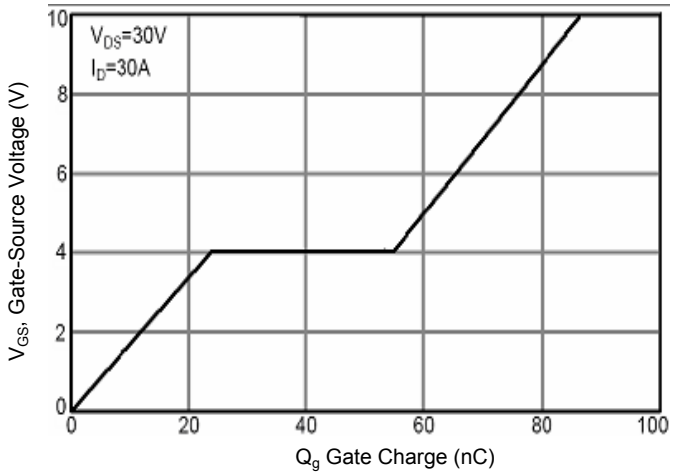


Fig-6: Source- Drain Diode Forward

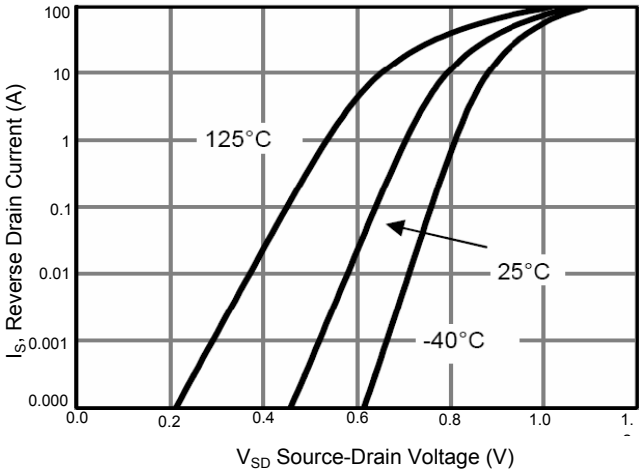


Fig-7: Capacitance vs V_{DS}

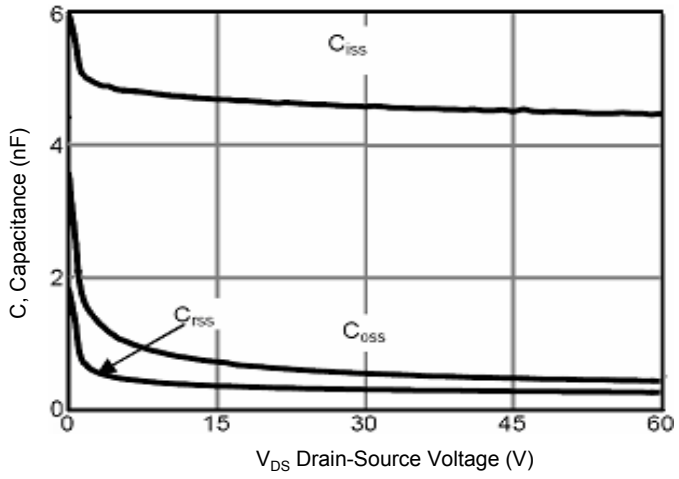


Fig-8: Safe Operation Area

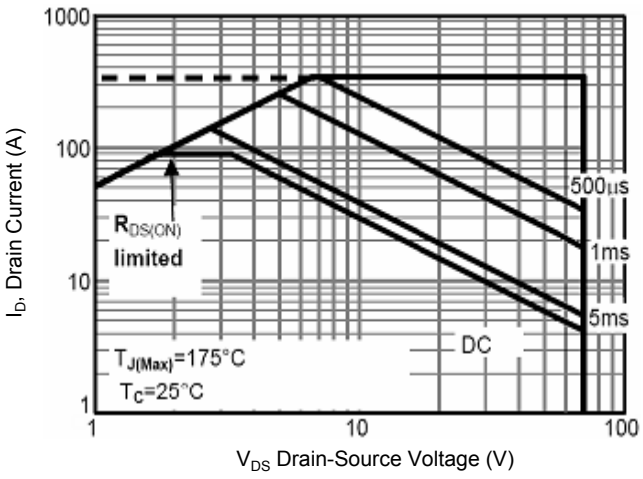


Fig-9: BV_{DSS} vs Junction Temperature

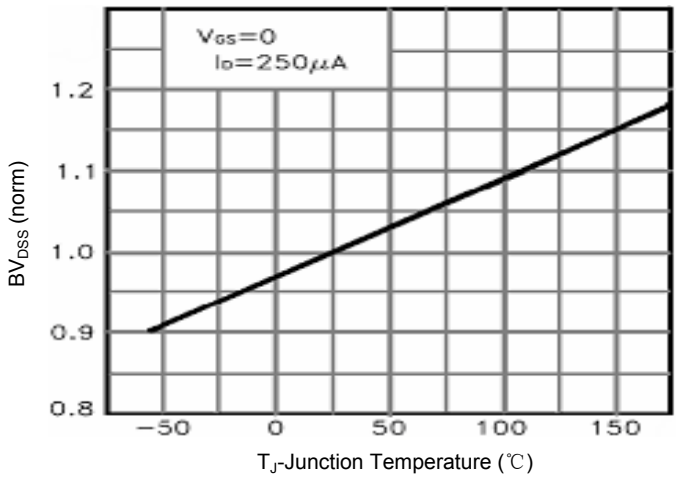


Fig-10: Safe Operation Area

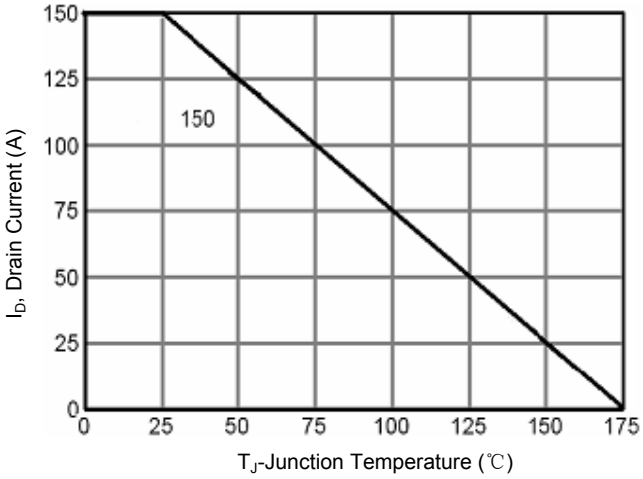
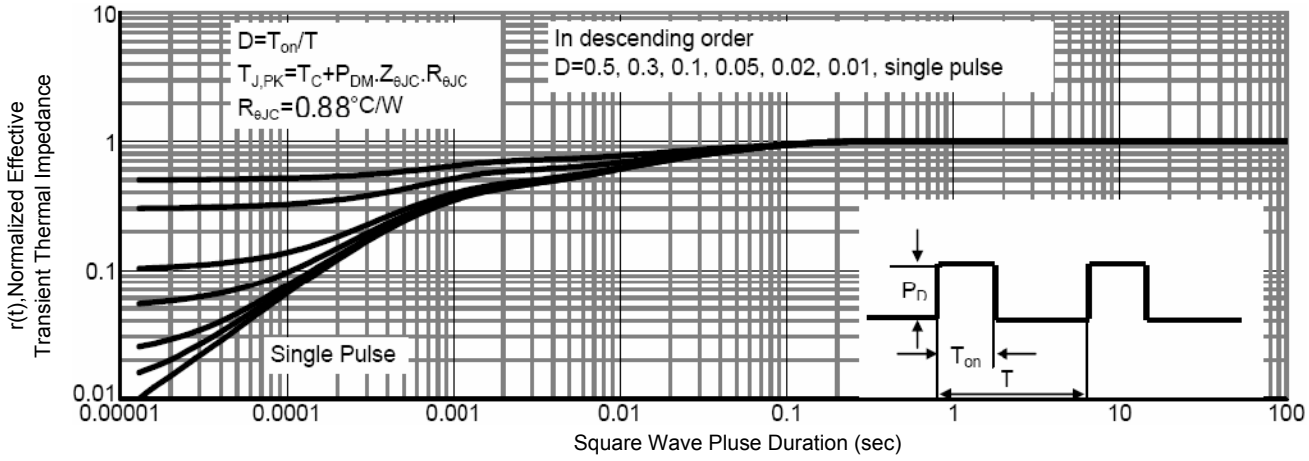
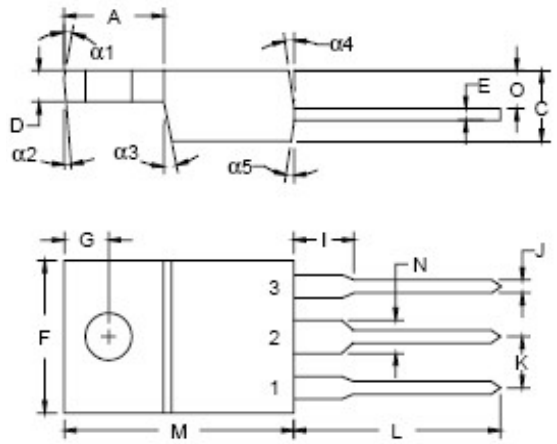


Fig-11: Normalized Maximum Transient Thermal Impedance



PACKAGE DIMENSIONS

■ TO-220AB（TO-220P）Dimension（封装尺寸数据, 单位: mm）

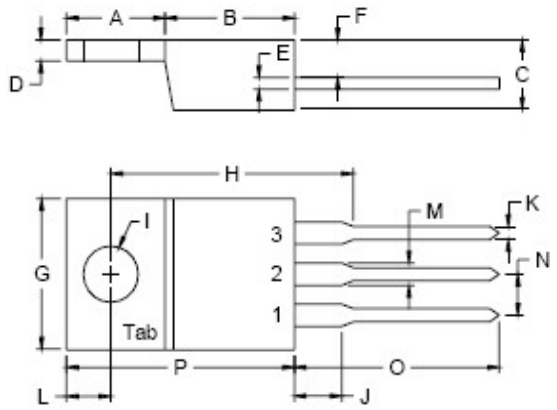


DIM	Min.	Max.
A	6.48	7.40
C	4.40	4.90
D	2.34	3.00
E	0.45	0.80
F	9.80	10.36
G	3.10	3.60
I	2.70	3.43
J	0.60	1.00
K	2.34	2.74
L	12.48	13.60
M	15.67	16.20
N	0.90	1.47
O	2.00	2.96
α1/2/4/5	-	*5°
α3	-	*27°

元件打印标识

左上角: LOGO
AAA: 芯片代码
BBBBB: 批次识别码
aabb: 生产批号
　其中:
　aa: 出厂年份
　bb: 出厂自然周
　（01~53）
XXXXXXXX: 器件型号

■ TO-220F（TO-220FP）Dimension（封装尺寸数据, 单位: mm）



DIM	Min.	Max.
A	5.58	7.49
B	8.38	8.90
C	4.40	4.70
D	1.15	1.39
E	0.35	0.60
F	2.03	2.92
G	9.66	10.28
H	--	*16.25
I	--	*3.83
J	3.00	4.00
K	0.75	0.95
L	2.54	3.42
M	1.14	1.40
N	--	*2.54
O	12.70	14.27
P	14.48	15.87

元件打印标识

左上角: LOGO
AAA: 芯片代码
XXXXXXXX: 器件型号
BBBBB: 批次识别码
aabb: 生产批号
　其中:
　aa: 出厂年份
　bb: 出厂自然周
　（01~53）

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2012-04-24， HAOHAI ™ Product Data-1.0
2014-07-10， HAOHAI ™ Product Data-1.1

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