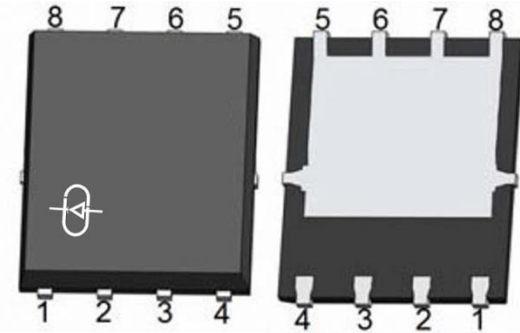


100A, 30V N-CHANNEL SUPER TRENCH POWER MOSFET

DESCRIPTION:



The ALP100N03S is an 100A, 30V N-Channel Super Trench Power MOSFET and it has fast a very low on-resistance $R_{DS(on)}$

FEATURES:

- $V_{(BR)DSS} = 30V$, $I_D = 100A$
- $R_{DS(ON)MAX} = 2.5m\Omega$ @ $V_{GS} = 10V$, $I_D = 100A$.
- $R_{DS(ON)MAX} = 3.5m\Omega$ @ $V_{GS} = 4.5V$, $I_D = 100A$.
- Very low on-resistance $R_{DS(on)}$.
- Excellent package for heat dissipation.
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicated Halogen Free part, ex. ALP100N03S-H

APPLICATIONS:

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply.

MECHANICAL CHARACTERISTICS

- Case: Molded plastic, DFN5X6-8L
- Mounting Position: Any.

MAXIMUM RATINGS

MAXIMUM RATINGS @ $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified			
PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current $T_C = 25^{\circ}\text{C}$ $T_C = 100^{\circ}\text{C}$	I_D	100 70.7	A
Pulsed Drain Current	I_{DM}	300	A
Power Dissipation	P_D	65	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.3	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS @ TA = 25 °C unless otherwise specified

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	$V_{(BR)DSS}$	30			V
Zero gate voltage drain current	$V_{DS}=30V, V_{GS}=0V$	I_{DSS}			1.0	μA
Gate-body leakage current	$V_{GS}= \pm 20V, V_{DS}= 0V$	I_{GSS}			± 100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{DS}= V_{GS}, I_D= 250\mu A$	$V_{GS(th)}$	1.2		2.5	V
Drain-to-Source On-Resistance (Note 1)	$V_{GS}= 10V, I_D= 20A$	$R_{DS(ON)}$			2.5	m Ω
	$V_{GS}= 4.5V, I_D= 10A$				3.5	
Forward transconductance (Note 1)	$V_{DS}=10V, I_D=20A$	g_{FS}	32			S

DYNAMIC CHARACTERISTICS (Note 2)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Input Capacitance	$V_{DS}= 15V, V_{GS}= 0V, F_{req}= 1.0\text{ MHz}$	C_{iss}		5000		pF
Output Capacitance	$V_{DS}= 15V, V_{GS}= 0V, F_{req}= 1.0\text{ MHz}$	C_{oss}		1135		pF
Reverse Transfer Capacitance	$V_{DS}= 15V, V_{GS}= 0V, F_{req}= 1.0\text{ MHz}$	C_{rss}		563		pF

SWITCHING CHARACTERISTICS						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Total Gate Charge	$V_{DS}= 15V, V_{GS}= 10V, I_D= 20A$	Q_g		38		nC
Gate to Source Charge	$V_{DS}= 15V, V_{GS}= 10V, I_D= 20A$	Q_{gs}		9		nC
Gate to Drain Charge	$V_{DS}= 15V, V_{GS}= 10V, I_D= 20A$	Q_{gd}		13		nC
Turn-On Delay Time	$V_{DD}= 15V, V_{GS}= 10V,$ $R_L= 15\Omega, R_{GEN}= 2.5\Omega$	$t_{d(on)}$		26		nS
Turn-On Rise time	$V_{DD}= 15V, V_{GS}= 10V,$ $R_L= 15\Omega, R_{GEN}= 2.5\Omega$	t_r		24		nS
Turn-Off Delay Time	$V_{DD}= 15V, V_{GS}= 10V,$ $R_L= 15\Omega, R_{GEN}= 2.5\Omega$	$t_{d(off)}$		91		nS
Turn-Off Fall time	$V_{DD}= 15V, V_{GS}= 10V,$ $R_L= 15\Omega, R_{GEN}= 2.5\Omega$	t_f		39		nS

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Diode forward Current (Note 1)		I_S			100	A
Diode forward Voltage	$I_S= 10A, V_{GS}= 0V$	V_{DS}			1.2	V
Reverse recovery time	$T_J= 25^\circ C, I_F= 20A, di/dt=100A/\mu s$ (Note 1)	t_{rr}		42		nS
Reverse recovery charge	$T_J= 25^\circ C, I_F= 20A, di/dt=100A/\mu s$ (Note 1)	Q_{rr}		39		nC

Note:

1. Pulse test (pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$).
2. Guaranteed by design, not subject to production testing.

TYPICAL DEVICE RATING AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)

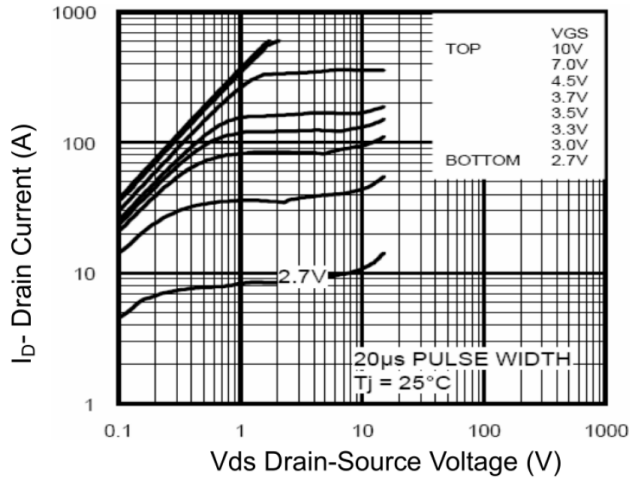


Fig.1 OUTPUT CHARACTERISTICS

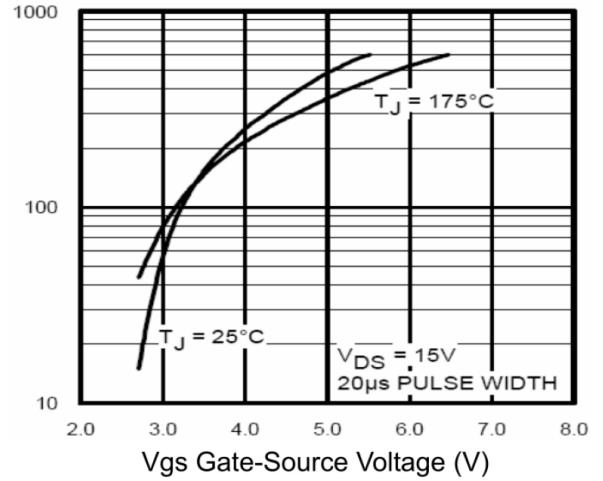


Fig.2 TRANSFER CHARACTERISTICS

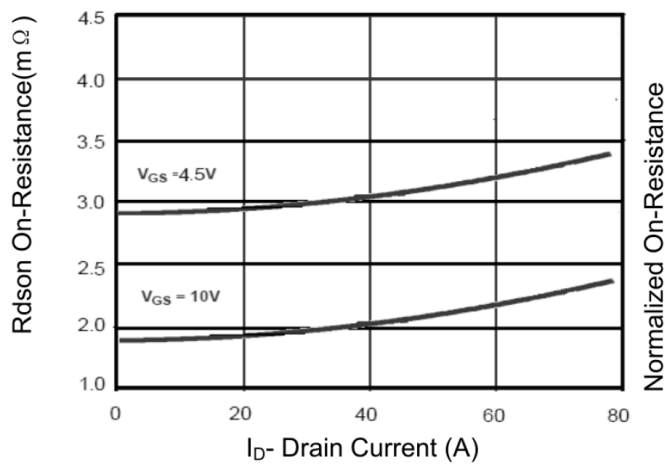


Fig.3 $R_{DS(on)}$ - DRAIN CURRENT

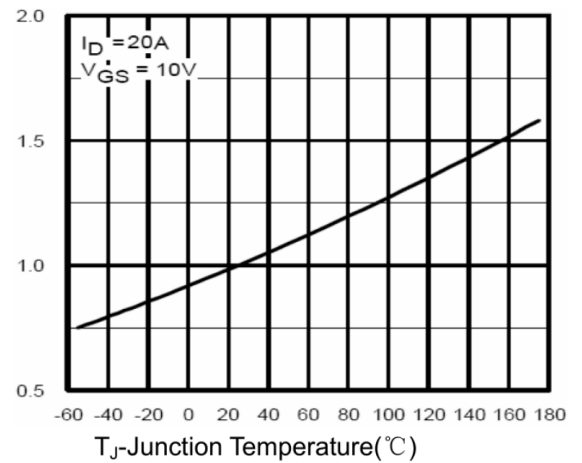


Fig.4 $R_{DS(on)}$ - JUNCTION TEMPERATURE

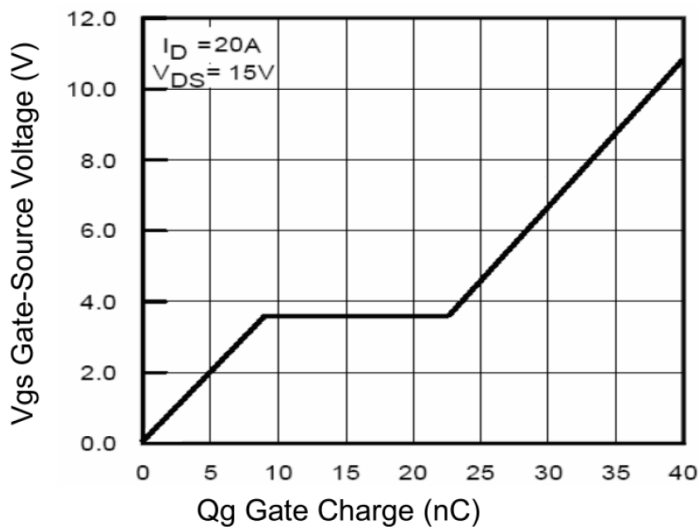


Fig.5 GATE CHARGE

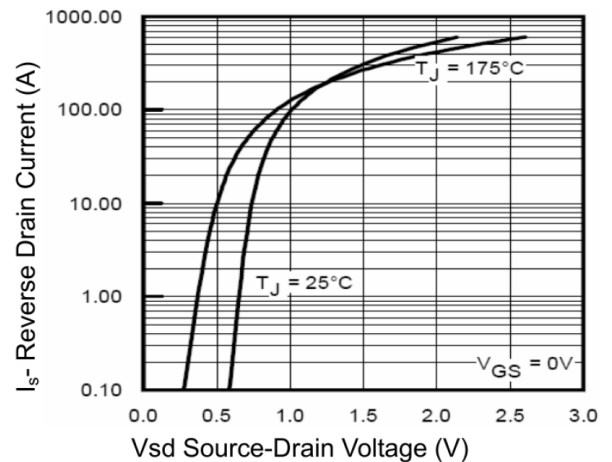
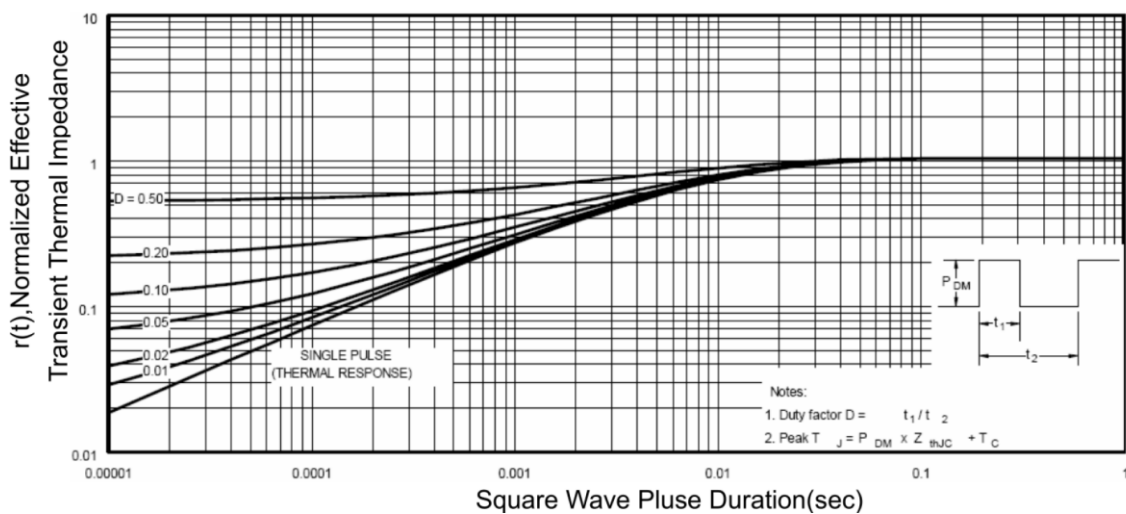
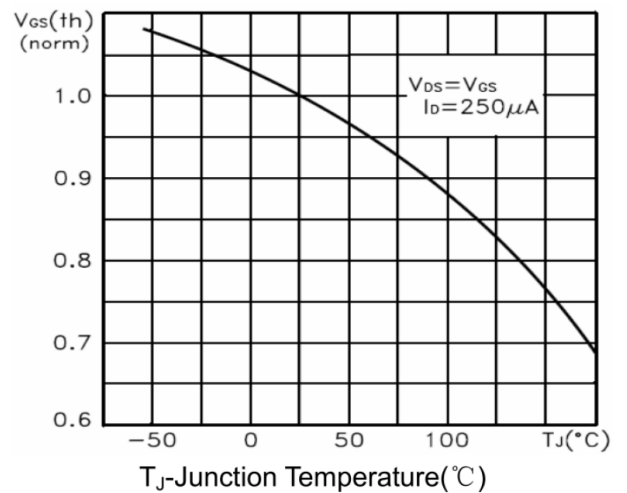
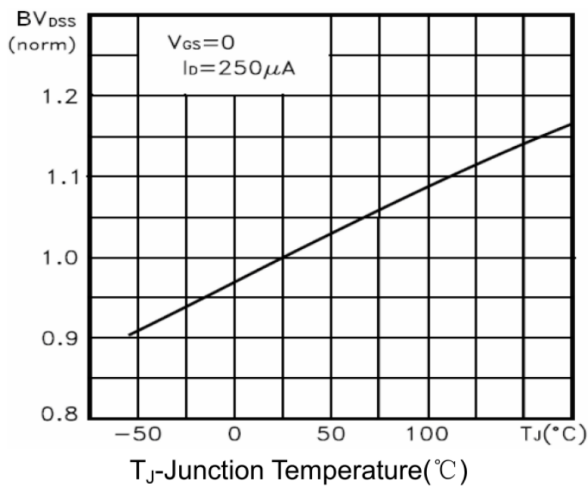
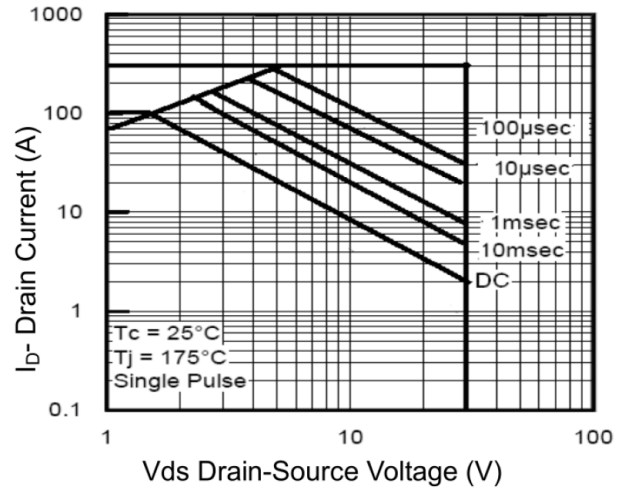
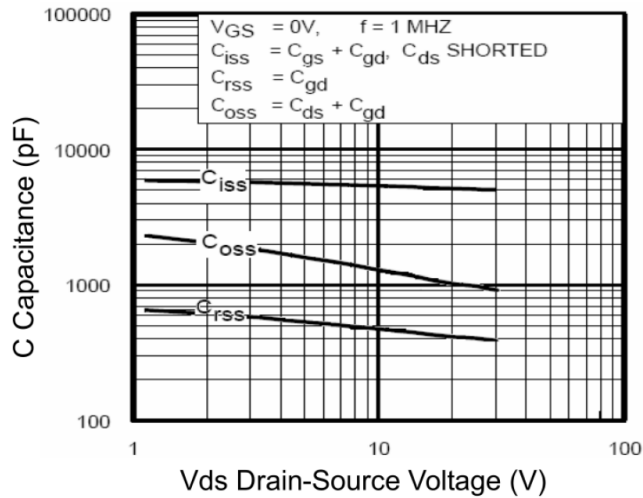
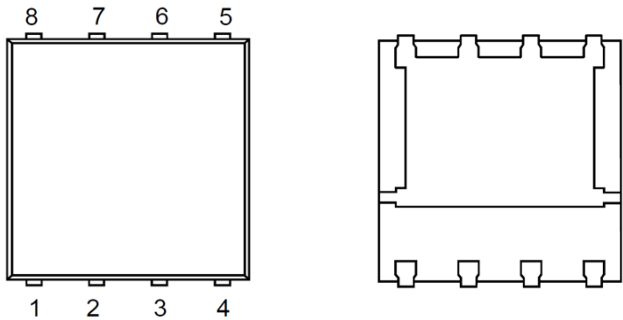
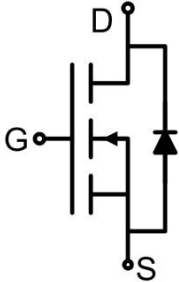


Fig.6 SOURCE - DRIAN DIODE FORWARD

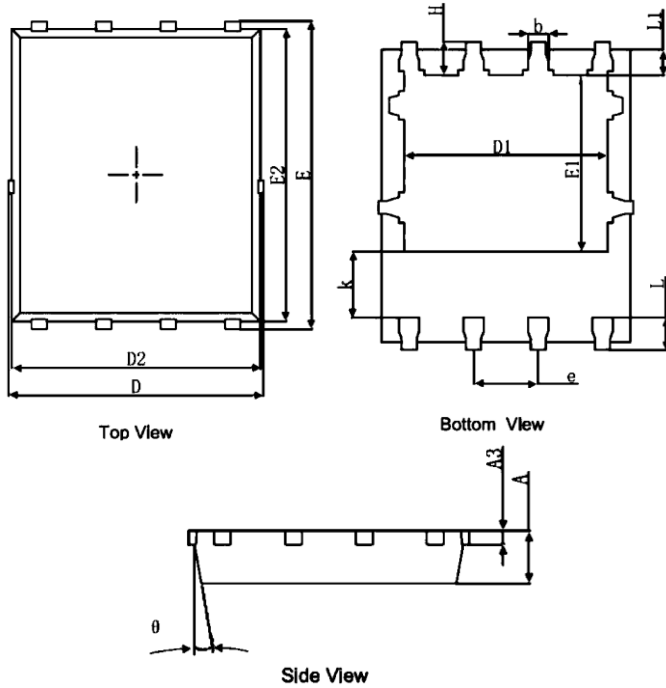


PINNING INFORMATION

PIN	SIMPLIFIED OUTLINE	CIRCUIT DIAGRAM
Pin1 Source Pin2 Source Pin3 Source Pin4 Gate Pin5 Drain Pin6 Drain Pin7 Drain Pin8 Drain		

PACKAGE INFORMATION

DFN5X6-8L

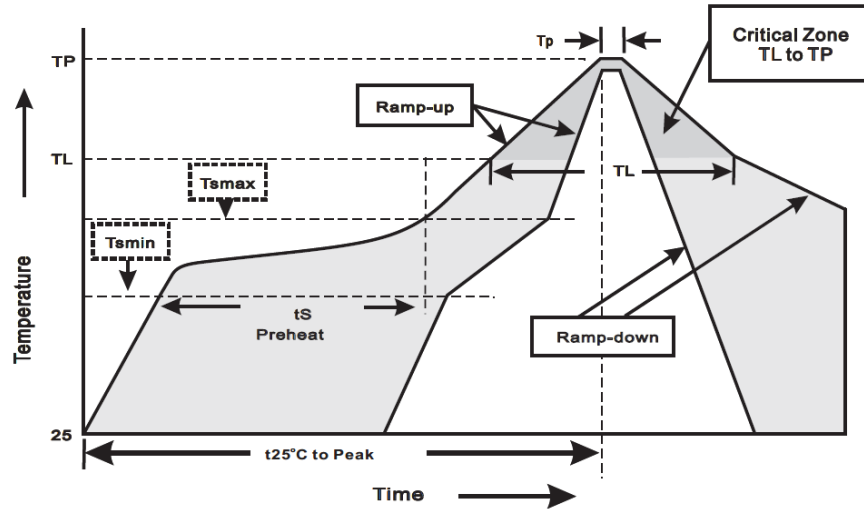


OUTLINE DIMENSIONS				
SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
b	0.350	0.450	0.014	0.018
D	4.944	5.096	0.195	0.201
D1	3.910	4.110	0.154	0.162
D2	4.824	4.976	0.190	0.196
E	5.974	6.126	0.235	0.241
E1	3.375	3.575	0.133	0.141
E2	5.674	5.826	0.223	0.229
e	1.270TYP.		0.050TYP.	
k	1.190	1.390	0.047	0.055
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	8°	12°	8°	12°

SOLDERING PARAMETERS

SUGGESTED THERMAL PROFILES FOR SOLDERING PROCESSES

1. Storage environment: Temperature=5 °C~40 °C Humidity=55% ±25%
2. Reflow soldering of surface-mount devices



3. Reflow soldering

PROFILE FEATURE	SOLDERING CONDITION
Average ramp-up rate (T_L to T_p)	<3 °C/sec
Preheat	
- Temperature Min (T_{smin})	150 °C
- Temperature Max (T_{smax})	200 °C
- Time (min to max) (t_s)	60 ~ 120 sec
T_{smax} to T_L	
- Ramp-upRate	<3 °C/sec
Time maintained above:	
- Temperature (T_L)	217 °C
- Time(t_L)	60 ~ 260 sec
Peak Temperature (T_p)	255 °C-0/+5 °C
Time within 5 °C of actual Peak Temperature(t_p)	10 ~ 30 sec
Ramp-down Rate	<6 °C/sec
Time 25 °C to Peak Temperature	<6 minutes



beyond boundaries...

ALP100N03S

DFN5X6-8L

CUSTOMER NOTE:

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2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).



sales@alpinesemi.com

www.alpinesemi.com