P&S

武汉力源信息技术股份有限公司

Wuhan P&S Information Technology Co.,Ltd.

中国 IC 分销行业领航者

www.icbase.com

力源信息发展历程

01

2001年08月09日成立,
注册资金 **6.57亿**

02

2011 年
中国电子元器件服务
领域第一家上市公司
（股票代码:300184）

03

2019 年销售额突破
130亿 RMB

04

中国本土元器件分销
销售额 **Top3**

合作伙伴

2002 年力源信息正式成为安森美半导体授权分销商，安森美半导体亚太区样品仓，代理安森美半导体全线产品。

力源信息在武汉拥有 11000 平方米的专业防静电仓库和 10000 平方米的公用型保税仓库，是目前中国境内最大的电子元器件货仓之一。安森美半导体亚太区样品仓就设在此仓库，该样品仓有 6000 余个安森美半导体最新型号的样品，价值近亿元人民币。

安森美半导体电源解决方案

梁 辉

2020/06/30

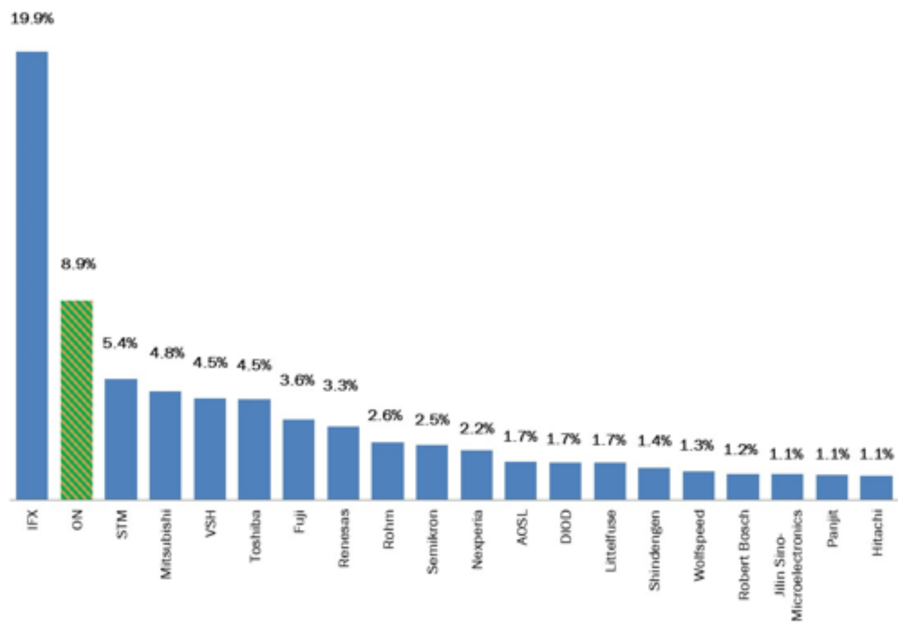
目录

安森美半导体- 功率元件的领导者

前20大集成器件制造商 – 2018年全球市场份额

Rank	Company	Market Share
1	Samsung	15.4%
2	Intel	14.4%
3	SK Hynix	7.5%
4	Micron	6.1%
5	TI	3.2%
6	Toshiba Memory Corp.	2.3%
7	STMicro	2.0%
8	Infineon	1.9%
9	NXP	1.9%
10	Renesas	1.4%
11	Sony	1.4%
12	Analog Devices	1.3%
13	**ON**	**1.2%**
14	Microchip	1.1%
15	Skyworks Solutions	0.8%
16	ROHM	0.6%
17	Toshiba	0.6%
18	Nanya Technology	0.6%
19	Qorvo	0.6%
20	Robert Bosch	0.5%

顶尖功率半导体分立和模块半导体供应商 2018年全球市场份额

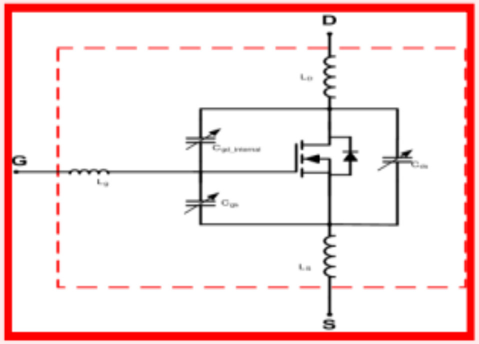


超结 MOSFET – 应用领域

超结第3代MOSFET – 类型定义

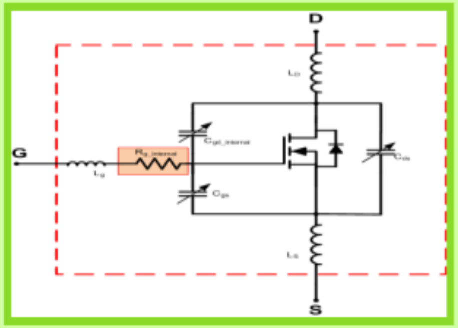
FAST Version

- High efficiency
- Hard Switching Topologies
- Reduced Qg and Eoss



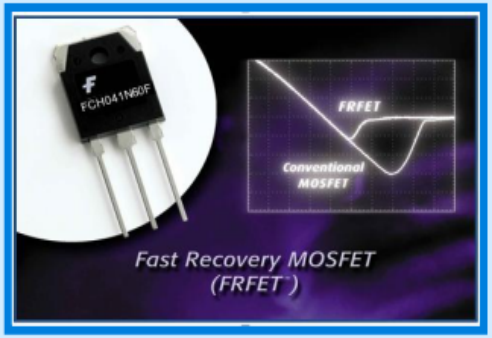
Easy Driver Version

- Hard/Soft Switching Topologies
- Easy to drive
- Low EMI and Voltage spikes
- Internal Rg and optimized Cap



FRFET Version

- Soft switching topologies
- Better system reliability
- Small Qrr and Trr
- Robust diode ruggedness



650V 超结第3代易驱动MOSFET 产品规划

Released
Engineering Sample available
In Development
Planning

(Sample Date/Release Date)

PKG	D / IPAK	D2 / I2PAK	Power56	Power88	TOLL	TO-220	TO-220F	TO-247	TO-247-4L	POWER-247
RDS(on)										
15mΩ										FCY015N65S3 (Feb/Mar'21)
17mΩ										FCY017N65S3 (Mar/Apr'21)
23mΩ								FCH023N65S3	FCH023N65S3L4	
29mΩ								FCH02XXXXX (Mar/May'20)		
40mΩ								FCH040N65S3 FCHD040N65S3		
67/70mΩ		FCB070N65S3			NTBL070XXXXX (Sep/Dec'20)	FCP067N65S3	FCPF067N65S3	FCH067N65S3		
80mΩ				FCMT080N65S3	NTBL080XXXXX (Nov/Feb'21)					
99mΩ		FCB099N65S3		FCMT099N65S3	NTBL09XXXXX (Nov/Feb'21)	FCP099N65S3	FCPF099N65S3	FCH099N65S3		
125mΩ		FCB125N65S3 NTI125N6XXXXX (Sep/Oct'20)		FCMT125N65S3		FCP125N65S3 FCP125N65S3R0	FCPF125N65S3	FCH125N65S3R0 FCHD125N65S3R0		
165mΩ		NTI165N6XXXXX (Nov/Dec'20)				FCP165N65S3 FCP165N65S3R0	FCPF165N65S3L1 FCPF165N65S3R0L	FCH165N65S3R0		
180/190/199mΩ		FCB199N65S3 NTI199N6XXXXX (Sep/Oct'20)		FCMT180N65S3		FCP190N65S3 FCP190N65S3R0	FCPF190N65S3L1 FCPF190N65S3R0L	FCHD190N65S3R0		
250/260mΩ	FCD260N65S3	FCB260N65S3		FCMT250N65S3		FCP260N65S3	FCPF250N65S3L1 FCPF250N65S3R0L			
360mΩ	FCD360N65S3R0 FCU360N65S3R0		FCMS36XXXXX (May/Jun'21)	FCMT360N65S3		FCP360N65S3R0	FCPF360N65S3R0L			
600mΩ	FCD600N65S3R0 FCU600N65S3R0		FCMS60XXXXX			FCP600N65S3R0	FCPF600N65S3R0L			
900mΩ			FCMS900XXXXX							
1400mΩ			FCMS1400NXXXXX							

650V 超结第3代快速MOSFET 产品规划

PKG	DPAK	D2PAK	Power88	TOLL	TO-220	TO-220F	TO-247	TO-247-4L	POWER-247
RDS(on)									
15 / 17mΩ	Released Engineering Sample available In Development Planning (Sample Date/Release Date)								NTY015NXXXXX (Q4/Q4'21) NTY017NXXXXX (Q4/Q4'21)
19mΩ							NTHL019NXXXXX (Apr/Jul'20)	NTH4LN019NXXXXX (Aug/Nov'20)	
40mΩ							NTHL040NXXXXX (Sep'20/Jan'21)	NTH4LN040NXXXXX (Aug/Nov'20)	
50 / 55mΩ		NTB055NXXXXX (Q4/Q4'21)		NTBL050NXXXXX (Aug/Sep'20)	NTP055N65S3H		NTHL055NXXXXX (Sep/Oct'20)		
64 / 67mΩ			NTMT064N65S3H		NTP067NXXXXX (Jul/Aug'20)		NTHL067NXXXXX (Aug/Oct'20)	NTH4LN067NXXXXX (Sep/Nov'20)	
95mΩ		NTB095NXXXXX (Q4/Q4'21)	NTMT095N6XXXXX (Sep/Jan'21)	NTBL095NXXXXX (Oct/Jan'21)	NTP095NXXXXX (Jul/Oct'20)	NTPF095N6XXXXX (Aug'20/Dec'20)	NTHL095NXXXXX (Sep/Oct'20)	NTH4LN095NXXXXX (Sep/Nov'20)	
125mΩ			NTMT125NXXXXX (Sep'20/Jan'21)	NTBL125NXXXXX (Oct/Jan'21)	NTP125NXXXXX (Aug/Oct'20)	NTPF125N6XXXXX (Sep'20/Dec'20)	NTHL125NXXXXX (Sep/Oct'20)		
165mΩ					NTP165NXXXXX (Aug/Oct'20)	NTPF165NXXXXX (Oct'20/Dec'20)	NTHL165NXXXXX (Q2/Q2'21)		
190mΩ		NTB190NXXXXX (Q4/Q4'21)	NTMT190NXXXXX (Jun/Oct'20)	NTBL190NXXXXX (Q2/Q2'21)	NTP190NXXXXX (Jun/Sep'20)	NTPF190NXXXXX (Jul'20/Nov'20)	NTHL190NXXXXX (Sep/Oct'20)		
250mΩ	NTD250NXXXXX (Aug/Dec'20)					NTPF250NXXXXX (Aug/Nov'20)			
360mΩ	NTD360NXXXXX (Aug/Dec'20)					NTPF360NXXXXX (Aug/Nov'20)			

650V 超结第3代快恢复MOSFET 产品规划

PKG	D2PAK	Power88	TOLL	TO-220	TO-220F	TO-247	TO-247-4L
RDS(on)							
27mΩ	Released Engineering Sample available					NTH027N65S3F NTHL027N65S3HF	NTH4L027N65S3F
33mΩ	In Development Planning					NTHL033N65S3HF	
40mΩ	(Sample Date/Release Date)					NTHL040N65S3F NTHL040N65S3HF NTHLD040N65S3HF	NTH4L040N65S3F
50mΩ						NTHL050N65S3HF	
65mΩ						NTHL065N65S3F NTHL065NXXXXX (Mar/Sep'20)	
82mΩ	NTB082N65S3F		NTBL082N6XXXXX (Jul/Nov'20)	NTP082N65S3F NTP082N65S3HF (Mar/May'20)	NTPF082N65S3F	NTHL082N65S3F NTHL082N6XXXXX (Mar/Sep'20)	
90 / 95mΩ	NTB095N65S3HF	NTMT090N6XXXXX (Jun'19/Jul'20)	NTBL095N6XXXXX (Oct'20/Jan'21)	NTP095N65S3HF		NTHL095N65S3HF	
110mΩ	NTB110N65S3HF	NTMT110N6XXXXX (Aug/Sep'20)		NTP110N65S3HF	NTPF110N65S3HF	NTHL110N65S3F	
150mΩ	NTB150N65S3HF	NTMT150N6XXXXX (Aug/Sep'20)		NTP150N65S3HF	NTPF150N65S3HF		
190mΩ	NTB190N65S3HF	NTMT190N6XXXXX (Aug/Sep'20)	NTBL190N6XXXXX (Oct'20/Jan'21)	NTP190N65S3HF	NTPF190N65S3HF	NTHL190N65S3HF	
290mΩ					NTPF290N6XXXXX (Apr/May'21)		
400mΩ					NTPF400N65XXXXX (Apr/May'21)		

650V 超结第3代易驱动MOSFET 的特色及应用

Features

- Well balanced switching behavior
- Lower $R_{DS(ON)}$ / Same Packages
- Lower FOM
  - $R_{DS(ON)\ max.}$ X $Q_{g\ typ.}$
- Lower Eoss
- Robust body diode
- 650V

Benefits

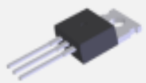
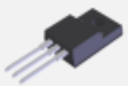
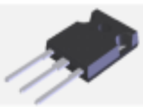
- Ease of use
- High Power Density
- Less paralleling MOSFET
- High System Efficiency
- Improved Light Load Efficiency
- High System Reliability
- Improved Safety Margin

Application

- Ease of use
- High Power Density
- Less paralleling MOSFET
- High System Efficiency
- Improved Light Load Efficiency
- High System Reliability
- Improved Safety Margin

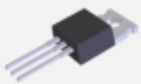
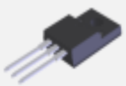
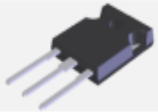
600V 超结第2代易驱动MOSFET

- 优化的开关速度

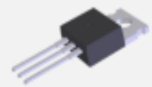
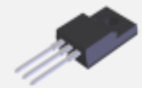
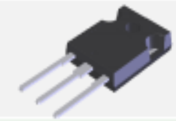
PKG	DPAK	TO-220	TO-220F	TO-247
RDS(on) / Qg / Rg				
41mΩ / 285nC / 1.2Ω				FCH041N60E
70mΩ / 128nC / 0.6Ω				FCH070N60E
99mΩ / 88nC / 0.6Ω		FCP099N60E		FCH099N60E
125mΩ / 75nC / 3.5Ω		FCP125N60E		FCH125N60E
165mΩ / 57nC / 6.0Ω		FCP165N60E		FCH165N60E
190mΩ / 63nC / 5.0Ω		FCP190N60E	FCPF190N60E FCPF190N60E_F152 (Narrow lead)	
260mΩ / 48nC / 5.8Ω		FCP260N60E	FCPF260N60E FCPF260N60E_F152 (Narrow lead)	
380mΩ / 34nC / 6.0Ω	FCD380N60E	FCP380N60E	FCPF380N60E FCPF380N60E_F152 (Narrow lead)	

600V 超结第2代快速MOSFET

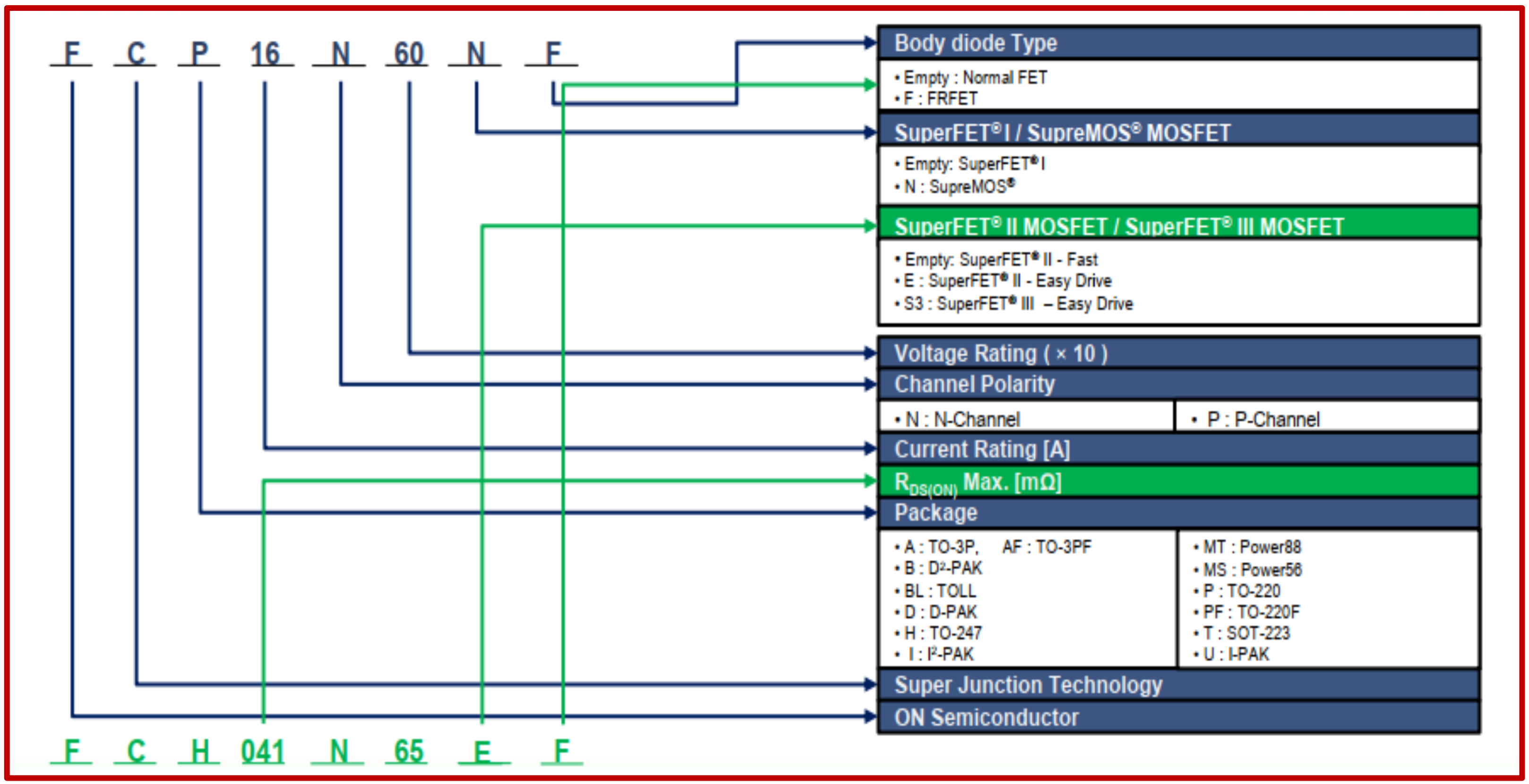
- 高开关速度

PKG	DPAK	IPAK	Power88	TO-220	TO-220F	TO-247
RDS(on) / Qg						
43mΩ / 163nC						FCH043N60
72mΩ / 95nC						FCH072N60
104mΩ / 63nC				FCP104N60		FCH104N60
130mΩ / 54nC				FCP130N60		FCH130N60
170mΩ / 42nC				FCP170N60		FCH170N60
190mΩ / 57nC				FCP190N60	FCPF190N60 FCPF190N60_F152	
199mΩ / 57nC			FCMT199N60			
299mΩ / 39nC			FCMT299N60			
380mΩ / 30nC				FCP380N60	FCPF380N60 FCPF380N60_F152	
400mΩ / 28nC					FCPF400N60	
600mΩ / 20nC	FCD600N60Z			FCP600N60Z	FCPF600N60Z FCPF600N60ZL1	
900mΩ / 20nC	FCD900N60Z	FCU900N60Z				

800V 超结MOSFET

PKG	DPAK	IPAK	D2PAK	TO-220	TO-220F	TO-247
RDS(on) / Qg						
60mΩ / 270nC						FCH060N80_F155
85mΩ / 196nC						FCH085N80_F155
220mΩ / 78nC				FCP220N80	FCPF220N80	
290mΩ / 58nC			FCB290N80	FCP290N80	FCPF290N80	
400mΩ / 43nC				FCP400N80Z	FCPF400N80Z FCPF400N80ZL1	
650mΩ / 27nC				FCP650N80Z	FCPF650N80Z	
850mΩ / 22nC	FCD850N80Z	FCU850N80Z		FCP850N80Z	FCPF850N80Z	
1300mΩ / 16.2nC	FCD1300N80Z				FCPF1300N80Z	
2250mΩ / 11nC	FCD2250N80Z	FCU2250N80Z			FCPF2250N80Z	
3400mΩ / 7.4nC	FCD3400N80Z	FCU3400N80Z				
4300mΩ / 6.8nC		FCU4300N80Z			FCPF4300N80Z	

SJ-MOSFET 命名规则(1)

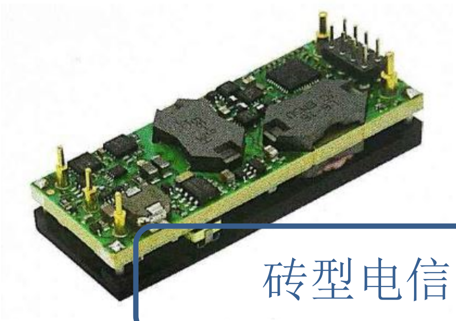


SJ-MOSFET 命名规则(2)

N T HL 040 N 65 S3 F

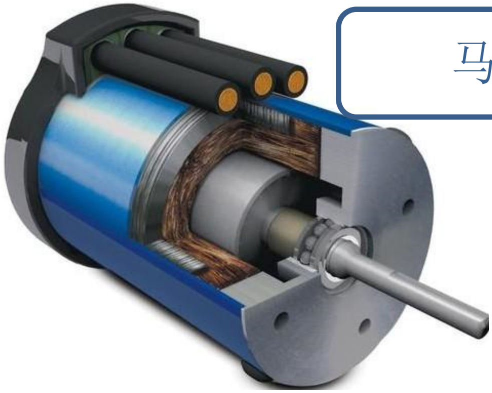
- **F** → **Body diode Type**
  - Empty : Normal FET
  - F : FRFET
- **S3** → **SuperFET® III MOSFET**
  - S3 : SuperFET® III – Easy Drive
  - S3H : SuperFET® III – Fast
- **65** → **Voltage Rating (× 10)**
- **N** → **Channel Polarity**
  - N : N-Channel
  - P : P-Channel
- **040** → **$R_{DS(ON)}$ Max. [mΩ]**
- **HL** → **Package**
  - A : TO-3P, AF : TO-3PF
  - B : D²-PAK
  - BL : TOLL
  - D : D-PAK
  - H : TO-247, HL : TO-247 Long lead
  - I : I²-PAK
  - MT : Power88
  - MS : Power56
  - P : TO-220
  - PF : TO-220F
  - T : SOT-223
  - U : I-PAK
- **T** → **Power FET**
- **N** → **ON Semiconductor**

中低压MOSFET-应用



砖型电信电源

笔记本电脑,平板电脑,
手机



马达驱动

AC-DC 电源次级整流

40V MOSFET 产品

Rds(on)	Power56			Power33	
RDS(on)	T6	T8 ★	MV5/8	T6	MV5/8
0.75/0.8mΩ	NTMFS5C404NL	NTMFS5H400NL			
0.85mΩ			FDMS8350L		
0.9~0.92/1.1mΩ	NTMFS5C410NL NTMFS5C410N	NTMFS5H409NL (1.1mΩ)	FDMS8320LDC * FDMS8320L (1.1mΩ)	* : Dual Cool	
1.5~1.7/1.4mΩ	NTMFS5C430NL NTMFS5C430N	NTMFS5H414NL	FDMS015N04B (1.5mΩ)		
2/2.1mΩ	NTMFS5C423NL	NTMFS5H419NL	FDMS8460 (2.2mΩ)		FDMC8360L
2.3~2.5mΩ	NTMFS5C442NL NTMFS5C442N				FDMC8321LDC FDMC8321L
2.8~3.3mΩ	NTMFS5C450NL NTMFS5C450N	NTMFS5H425NL NTMFS5H431NL	FDMS8333L (3.1mΩ)	NTTFS5C453NL (3.0mΩ)	
3.7/3.8mΩ	NTMFS5C456NL			NTTFS5C454NL (3.8mΩ)	
4.5mΩ	NTMFS5C460NL				
5.8mΩ					FDMC8462
9.7mΩ					FDMC8327L
10.3mΩ	NTMFS5C468NL				

Rds(on)	DPAK	D2PAK-7L	Power88	TOLL
RDS(on)				
0.4mΩ			NTMTS0D4N04C	
0.45mΩ			NTMTS0D4N04CL	
0.55mΩ			NTMTS0D6N04C	
0.56mΩ			FDMT80040DC	
0.6mΩ			NTMTS0D6N04CL	
0.65mΩ				FDBL0065N40
0.7mΩ			NTMTS0D7N04C	
0.75mΩ			NTMTS0D7N04CL	
0.8mΩ		FDB0105N407L		
0.9mΩ				FDBL0090N40
1.2mΩ				FDBL0120N40
2.2mΩ	NTD5C434N			
3.6mΩ	NTD5C446N			
5.7mΩ	NTD5C464N			

* : Dual Cool

Released
ES Sample available
In Development

(Sample Date/Release Date)

★ Key Product and New Technology / Latest Technology

60V MOSFET 产品

Rds(on)	Power56			Power33	
RDS(on)	T6	T8 ★	MV7	T6	MV5/8
1.2~1.3mΩ	NTMFS5C604NL NTMFS5C604N	NTMFS5H600NL			
1.5mΩ	NTMFS5C612NL NTMFS5C612N				
1.65mΩ			FDMS86550		
1.8mΩ		NTMFS5H615NL	* : Dual Cool		
2.3mΩ			FDMS86500DC *		
2.4~2.5mΩ	NTMFS5C628NL NTMFS5C628N		FDMS86500L		
3.1mΩ		NTMFS5H630NL			
3.4mΩ			FDMS86540		
4mΩ	NTMFS5C645NL NTMFS5C645N				
4.3mΩ					FDMC86570L
4.7mΩ	NTMFS5C646NL NTMFS5C646N →	(Ready / Dec'19)			
6.1mΩ	NTMFS5C670NL NTMFS5C670N →	(Ready / Dec'19)			
6.3mΩ				NTTFS5C670NL (6.5mΩ)	FDMC86520DC *
7.2mΩ		NTMFS5H663NL			
7.4mΩ			FDMS86520		
7.9~8.2mΩ			FDMS86520L		FDMC86520L
9.2~9.3mΩ	NTMFS5C673NL NTMFS5C673N →	(Ready / Dec'19)		NTTFS5C673NL	
10mΩ		NTMFS5H610NL			

Others : NTMFS23D9N06HL (23.9mΩ) & NTMFS5C682NL (21mΩ)

★ Key Product and New Technology / Latest Technology

Rds(on)	TOLL	D2PAK-7L	Power88
RDS(on)			
0.6mΩ			NTMTS0D7N06CL
0.7~0.8mΩ	NTBLS0D7N06C	NTBGS0XXXXX (Q1'20 / Aug'20)	NTMTS0D7N06C
1mΩ	NTBLS001N06C FDBL0110N60	NTBGS00XXXXX (Q2'20 / Oct'20)	NTMTS001N06C NTMTS001N06CL FDMT80060DC *
1.4~1.5mΩ	FDBL0150N60	FDB0170N607L NTBGS1XXXXX (Q2'20 / Oct'20)	
2.0mΩ		NTBGS002XXXXX (Q2'20 / Aug'20)	
2.5mΩ , 3.5mΩ		NTBGS2DXXXXX NTBGS3DXXXXX (Q2'20 / Aug'20)	

* : Dual Cool

Rds(on)	DPAK	TO220	TO220F
2.0~2.2mΩ	NTD5C434N	FDP020N06B	
3mΩ	NTD5C632NL	FDP030N06B	
3.5~3.6mΩ	NTD5C446N		FDPF035N06B
4.1mΩ	FDD86540		FDPF041N06BL1
4.6mΩ	NTD5C648NL		
5.7mΩ	NTD5C464N		
9.3mΩ	NTD5C668NL		
17.5mΩ	NTD5C684NL		
30mΩ	NTD5C688NL		

Released
ES Sample available
In Development

(Sample Date/Release Date)

P&S

80V MOSFET 产品

Rds(on)	Power56			Power33	
RDS(on)	MV7	PTNG	T8	MV7	PTNG
2.2mΩ			NTMFS6H800N NTMFS6H800NL		
2.4~2.5mΩ	FDMS86350	FDMS2D5N08C			
2.8mΩ			NTMFS6H801N		
3.0~3.1mΩ	FDMS86300DC *	FDMS003N08C			
3.5, 3.7mΩ	FDMS037N08B	FDMS3D5N08LC	NTMFS6H818N		
3.9~4.0mΩ	FDMS039N08B FDMS86300	FDMS004N08C NTMFSC004N08MC (Ready / Dec'19)			
4.3~4.8mΩ	FDMS86310	FDMS4D4N08C FDMS4D5N08LC	NTMFS6H824N		
6.5~6.7mΩ		NTMFS006N08MC (Ready / Mar'20) FDMS007N08LC	NTMFS6H836N	FDMC86340	
7~7.8mΩ	FDMS86322				FDMC007N08LC FDMC007N08LCDC * FDMC008N08C
9.4~9.5mΩ			NTMFS6H848N		NTTFS6H850N (T8) NTTFS6H850NL
10mΩ					FDMC010N08C FDMC010N08LC
11.7mΩ	FDMS86320		NTMFS6H852N (14.7mΩ)	FDMC86320	NTTFS6H854N (14.5mΩ)
23mΩ			NTMFS6H858N (20.7mΩ)	FDMC86324	NTTFS6H860N (21.1mΩ)

* : Dual Cool

Released
ES Sample available
In Development

(Sample Date/Release Date)

T8 80V Logic level product will be released in 1H'20

Rds(on)	TOLL	D2PAK-7L	Power88
RDS(on)			
1.1~1.7mΩ	NTBLS1D1N08H NTBLS1D7xxxxx (sample ready / Release : Sep'20) NTBLS1D5N08MC FDBL0150N80	NTBGS1D2xxxxx (sample : Ready / Release : Oct'20) NTBGS1D5xxxxx (sample : Ready / Release : Oct'20)	NTMTS1D2N08H NTMTS1D5N08H NTMTS1D5N08MC NTMTSC1D5N08MC FDMT80080DC
1.9~2.0mΩ	NTBLS002N08MC	NTBGS1D[illegible]xxxxx (sample : Jan'20 / Release : Oct'20) NTBGS002xxxxx (sample : Ready / Release : Oct'20)	NTMTS002N08MC
1.6~1.7mΩ		FDB0165N807L FDB0190N807L	
2mΩ	FDBL0210N80		
2.2~2.4mΩ		FDB0250N807L FDB024N08BL7	
3mΩ	FDBL0330N80		

* : Dual Cool

Rds(on)	DPAK
RDS(on)	
23mΩ	FDD86326

Rds(on)	TO220
RDS(on)	
2.3mΩ	FDP023N08B
2.7mΩ	FDP027N08B
3.2mΩ	FDP032N08B
3.9mΩ	FDP039N08B
5.3mΩ	FDP053N08B

100V MOSFET 产品

Rds(on)	Power56	Power33
RDS(on)		
3.2mΩ	FDMS86180 ★	
4.2mΩ	FDMS86181 ★	
4.8~4.85mΩ	FDMS86150 NTMFS6B03N	
6mΩ	FDMS86152	
7.2mΩ	FDMS86182 ★	
7.5mΩ	FDMS86101DC *	
8, 8.5mΩ	FDMS86101 FDMS86103 NTMFS6B05N	FDMC86184 ★ (8.5mΩ)
10.6mΩ	★	NTTFS010N10MCL
12.8mΩ	FDMS86183	
15mΩ	NTMFS6B14N	
24mΩ	FDMS86104	
25mΩ	FDMS86102LZ	
34mΩ	FDMS86105	
56mΩ	FDMS8622	

* : Dual Cool

★ New Release and New Technology / Latest Technology

Rds(on)	TO220	TO220F	D2PAK	D2PAK-7L	Power88	TOLL
RDS(on)						
1.6~2.0mΩ				FDB1D7N10CL7 ★	NTMTS1D6N10MC (Sample : Now / May'20) NTMTSC1D6N10MC (Sample : Now / May'20) NTMTS002N10MC (Sample : Now / May'20) NTMTSC002N10MC (Sample : Now / May'20)	FDBL0200N100 (2mΩ)
2.3~2.6mΩ	FDP2D3N10C ★	FDPF2D3N10C ★		NTBGS2D5NXXXXX (Ready / Jul'20) FDB0260N1007L (2.6mΩ)	NTMTS2D5N10MC (Sample Now / May'20)	FDBL0260N100
2.8~3.0mΩ				NTBGS3D0NXXXXX (Ready / Aug'20) FDB0300N1007L	NTMTS003N10MC (Sample : Now / May'20) FDMT800100DC*	FDBL0240N100 (2.8mΩ)
3.5~3.6mΩ	FDP036N10A		FDB035N10A	NTBGS3D5NXXXXX (Ready / Aug'20)		
4.0mΩ				NTBGS4D0NXXXXX (Ready / Aug'20)		
4.5mΩ	FDP4D5N10C ★ FDP045N10A	FDPF4D5N10C ★ FDPF045N10A				
8.5~9.0mΩ	FDP8D5N10C ★ FDP085N10A	FDPF8D5N10C ★ FDPF085N10A	NTBS9D0NXXXXX (Ready / Aug'20)	DPAK		
10.2mΩ				FDD86110		
15mΩ	FDP150N10A					
22.5mΩ				FDD86102LZ		
24mΩ			FDB86102LZ	FDD86102		

* : Dual Cool

Released
ES Sample available
In Development

(Sample Date/Release Date)

P&S

120V MOSFET产品

Rds(on)	Power33	Power56		Power88	TO220	TO220F	D2PAK	D2PAK-7L
RDS(on)	PTNG	MV5	PTNG	MV5	PTNG	PTNG	PTNG	PTNG
2.9~3.2mΩ				* : Dual Cool	FDP2D9N12C	NTPF3D2NXXXXX (Jan'20 / Mar'21)	NTBS3D1N1XXXXX (Jan'20 / Apr'21)	NTBGS2D9IXXXXX (Feb'20 / Apr'21)
4mΩ			FDMS4D0N12C		NTP4D0NXXXXX (Sep'20 / Apr'21)	NTPF4D0NXXXXX (Sep'20 / Mar'21)		
4.2mΩ				FDMT800120DC *				
6mΩ			NTMFS00XXXXX NTMFSC00XXXXX (Ready / Oct'20)					
7.2mΩ		FDMS86202						
7.5mΩ					NTP7D5XXXXX (Sep'20 / Apr'21)	NTPF7D5XXXXX (Sep'20 / Apr'21)		
8mΩ			NTMFS008XXXXX (Ready / Oct'20)					
11.5mΩ		FDMS86201						
12mΩ	NTTFS012XXXXX (Ready / Feb'21)							
18mΩ	NTTFS018XXXXX (Ready / Nov'20)							

ES sample available

Dual Cool

Released
ES Sample available
In Development

(Sample Date/Release Date)

P&S

150V MOSFET产品

Rds(on)	Power56	Power33
RDS(on)		
7.5mΩ	NTMFS7D5NXXXXX (Ready / May'21)	
8.8mΩ	FDMS8D8N15C	
11.0mΩ	NTMFS011N15MC	
12.0mΩ	NTMFC01XXXXX (Ready / Jun'20)	Dual Cool
12.4mΩ	FDMS86255	
15.0mΩ	NTMFS015XXXXX (Ready / Apr'21)	
17mΩ	FDMS86200DC (Dual Cool)	
18mΩ	FDMS86200	
22.0mΩ	NTMFS02XXXXX (Ready / Apr'21)	NTTFS022XXXXX (Ready / Apr'21)
25mΩ	FDMS86250	
34.0mΩ	NTMFS034NXXXXX (Ready / Apr'21)	NTTFS03XXXXX (Ready / Apr'21) FDMC86260
51mΩ	FDMS86252	FDMC86240
56mΩ	FDMS86252L	
90mΩ		FDMC86248
134mΩ		FDMC86244

Rds(on)	TO220	D2PAK	TO247	D2PAK-7L	Power88	TOLL
RDS(on)						
4.0~4.5mΩ				NTBGS4D1N15MC	NTMTS4D3N15MC NTMTSC4D3N15MC (Ready / Jan~Feb'20)	NTBLS4D0N15MC (Ready / Feb'20) Dual Cool
5.0mΩ	NTP5D0NXXXXX (Ready / Aug'20)	NTB5D0NXXXXX (Ready / Sep'20)	FDH055N15A (5.9mΩ)			
6.0~6.5mΩ		ES sample available And, on the discussion/action to pull-in this RTM schedule than Aug.20		NTBGS6D5N15MC FDB0630N1507L FDB0690N1507L	NTMTS6D0N15MC (Ready / Jan'20) FDMT800150DC *	FDBL0630N150
7.3~7.5mΩ	NTP7DXXXXX (May'20 / Aug'20) FDP075N15A	NTB7D3NXXXXX (May'20 / Oct'20) FDB075N15A			* : Dual Cool	
8.2~8.3mΩ	FDP083N15A	FDB082N15A			FDMT800152DC * (9mΩ)	
11.0mΩ	NTP011XXXXX (May'20 / Sep'20)	NTB011NXXXXX (May'20 / Oct'20) FDB110N15A	DPAK			
15.0mΩ	TO220F		NTDS015NXXXXX (Ready / Apr'21)			
19mΩ	FDPF190N15A **					
22mΩ			FDD86250			
39~42mΩ	FDPF390N15A **	FDB390N15A	FDD390N15A FDD390N15ALZ			
52mΩ			FDD86252			
77mΩ	FDPF770N15A **		FDD770N15A			

XXXXX

Released
ES Sample available
In Development

(Sample Date/Release Date)

MV MOSFET 命名规则(1)

NT MFS 030 N 10 L D A

Option
- L: Logic Level Gate

PowerTrench Generation

•A: PowerTrench® 5 •B: PowerTrench® 7 •C: PTNG •D: PT11	•F: PT11E •X1: PT1 •X3: PT3 •X8:PT8	•X10:PT10 •T6/8: ON T6/T8 •G: Wide SOA Mosfet

Voltage Rating (× 10)

Channel Polarity
- N : N-Channel
- P : P-Channel

$R_{DS(ON)}$ Max. [mΩ] (3digits, 030=30mohm,0D3=0.3mohm,003=3mohm)

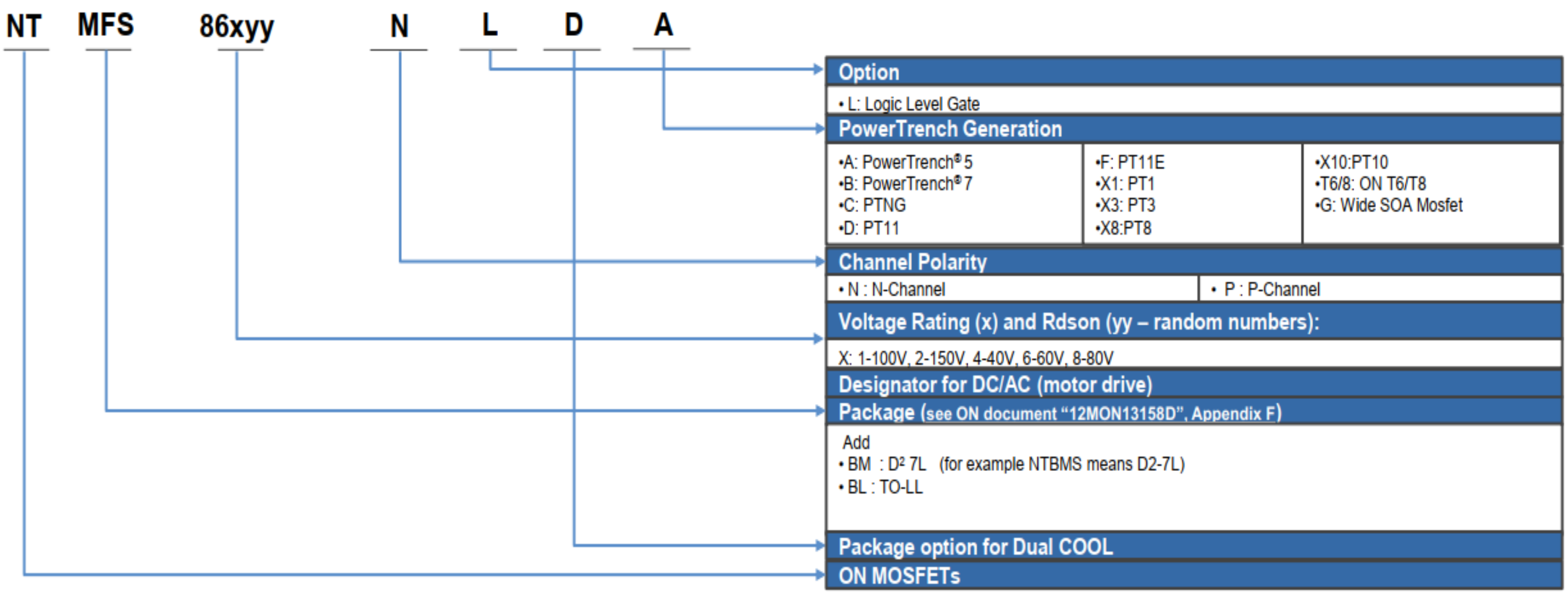
Package (see ON document "12MON13158D", Appendix F)

Add
- BM : D^2 7L (for example NTBMS means D2-7L)
- BL : TO-LL

Package option for Dual COOL

ON MOSFETs

MV MOSFET 命名规则(2)



SiC Diode & MOSFET—应用市场

汽车

充电桩

新能源

电源

SiC Diode & MOSFET

- 应用优势

Diode	MOSFET
✓ Very small reverse recovery loss	✓ High Voltage
✓ High blocking voltage	✓ Low switching Loss
✓ Low leakage current	✓ High Fsw
✓ Low forward voltage drop	✓ Small passives
✓ Surge and avalanche capabilities	✓ Few cooling
	✓ Low weight
	✓ Cost benefits

650V 1.0代 SiC Diode

(满足工业级规格)

I (A)	VF (V)	Die	TO-247-3L // Die	TO-247-2L	TO-220-2L	TO-220FP-2L	D2PAK	DPAK	PQFN-88
									
50	1.5	PCFFS5065AF	FFSH5065A-F155	FFSH5065A					
40		PCFFS4065AF	FFSH4065ADN	FFSH4065A					
30		PCFFS3065AF	FFSH3065ADN	FFSH3065A	FFSP3065A				
20			FFSH2065ADN	FFSH2065A	FFSP2065A	FFSPF2065A			
16			FFSH1665ADN	FFSH1665A	FFSP1665A				
12					FFSP1265A		FFSB1265A		FFSM1265A
10				FFSH1065A	FFSP1065A	FFSPF1065A	FFSB1065A	FFSD1065A	FFSM1065A
8					FFSP0865A	FFSPF0865A	FFSB0865A	FFSD0865A	FFSM0865A
6					FFSP0665A	FFSPF0665A	FFSB0665A	FFSD0665A	FFSM0665A
4					FFSP0465A		FFSB0465A	FFSD0465A	FFSM0465A

Single die device (instead of two parallel die) created as Wolfspeed drop-in replacement.

650V 1.5 代 SiC Diode

(满足工业级和车规级)

I (A)	VF (V)	Die	TO-247-3L // Die	TO-247-2L	TO-220-2L	TO-220-3L	D2PAK	DPAK	PQFN 88
50				FFSH5065B					
40			FFSH4065BDN			FFSP4065BDN			
30				FFSH3065B	FFSP3065B		FFSB3065B		
20	1.35		FFSH2065BDN	FFSH2065B	FFSP2065B	FFSP2065BDN	FFSB2065B FFSB2065BDN	FFSD2065B	Now / May'20 FFSM2065B
10				FFSH1065B	FFSP1065B		FFSB1065B	FFSD1065B	Now / May'20 FFSM1065B
8					FFSP0865B		FFSB0865B	FFSD0865B	Now / May'20 FFSM0865B
6					FFSP0665B		FFSB0665B	FFSD0665B	Now / May'20 FFSM0665B

1200V 1.0 代 SiC Diode 产品

(满足工业级和车规级)

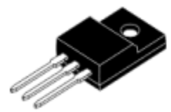
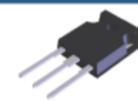
I (A)	VF (V)	Die	TO-247-3L // Die	TO-247-2L	TO-220-2L	D2PAK	DPAK
							
50	1.45	PCFFS50120AF		FFSH50120A			
40		PCFFS40120AF	FFSH40120ADN	FFSH40120A			
30		PCFFS30120AF	FFSH30120ADN	FFSH30120A			
20		PCFFS20120AF	FFSH20120ADN	FFSH20120A	FFSP20120A	FFSB20120A	
15		PCFFS15120AF	FFSH15120ADN	FFSH15120A	FFSP15120A		
10		PCFFS10120AF	FFSH10120ADN	FFSH10120A	FFSP10120A	FFSB10120A	FFSD10120A
8		PCFFS08120AF			FFSP08120A		FFSD08120A
5		PCFFS05120AF			FFSP05120A		

1700V 1.0 代 SiC Diodes 产品

IF (A)	VF (V)	Die – Wafer and T&R	TO-247-2
			
100		NDC100170A	
75		NDC75170A	
50		NDC50170A	
25	1.7	NDC25170A	NDSH25170A
15		NDC15170A	NDSH15170A
10		NDC10170A	NDSH10170A
5		NDC0517A	NDSH05170A

Devices in black – RTM
Devices in grey – in design phase, RTM Q3'2020

650V 1.0 代 SiC MOSFET产品

ID @ 25C (A)	$R_{DS(ON)}$ TYP (mΩ)	Die – Wafer and T&R	TO-220FP-3L	TO-247-3	TO-247-4	D2PAK-7L
						
TBD	15	NTC015N065SC1		NTHL015N065SC1	NTH4L015N065SC1	NTBG015N065SC1
TBD	20	NTC020N0XXXXX		NTHL020N0XXXXX	NTH4L020N0XXXXX	NTBG020N0XXXXX
TBD	30	NTC030N06XXXXX		NTHL030N0XXXXX	NTH4L030N0XXXXX	NTBG030N06XXXXX
TBD	45	NTC045N065SC1	NTFL045N065SC1	NTHL045N065SC1	NTH4L045N065SC1	NTBG045N065SC1
TBD	60	NTC060N0XXXXX		NTHL060N0XXXXX	NTH4L060NXXXXXL	NTBG060N0XXXXX
TBD	80	NTC080N0XXXXX		NTHL080N0XXXXX	NTH4L080N0XXXXX	NTBG080N0XXXXX
TBD	120	NTC120N0XXXXX		NTHL120N0XXXXX	NTH4L120NXXXXXL	NTBG120N0XXXXX

✓ Device in black- in RTM
✓ Device in grey – in design phase

900V 1.0 代 SiC MOSFET 产品

ID @ 25C (A)	$R_{DS(ON)}$ TYP (mΩ)	Die – Wafer and T&R	TO247-3	TO247-4	D2PAK-7L
90	20	N(V)TC020N090SC1	N(V)THL020N090SC1	N(V)TH4L020N090SC1	N(V)TBG020N090SC1
55	30	N(V)TC030NXXXXX 1	N(V)THL030XXXXX C1	N(V)TH4L03XXXXX SC1	N(V)TBG03XXXXX SC1
40	60	N(V)TC060N090SC1	N(V)THL060N090SC1	N(V)TH4L060N090SC1	N(V)TBG060N090SC1
30	75	N(V)TC075NXXXXX 1	N(V)THL075XXXXX C1	N(V)TH4L07XXXXX SC1	N(V)TBG075XXXXX SC1
20	120	N(V)TC120NXXXXX 1	N(V)THL120XXXXX C1	N(V)TH4L12XXXXX SC1	N(V)TBG12XXXXX SC1

- ✓ Devices in green – RTM
- ✓ Devices in black – samples available Feb'20, RTM Q3'20
- ✓ Devices in grey – in design phase, RTM Q4'2020/Q1'2021

1200V 1.0 代 SiC MOSFET 产品

ID @ 25C (A)	$R_{DS(ON)}$ TYP (mΩ)	Die – Wafer and T&R	TO247-3	TO247-4	D2PAK-7L
90	20	Now NTC020N120SC1	N(V)THL020N120SC1	N(V)TH4L020N120SC1	N(V)TBG020N120SC1
55	40	Now NTC040N120SC1	N(V)THL040N120SC1	N(V)TH4L040N120SC1	N(V)TBG040N120SC1
40	80	Now NTC080N120SC1	N(V)THL080N120SC1A	N(V)TH4L080N120SC1	N(V)TBG080N120SC1
20	160	Now NTC160N120SC1	N(V)THL160N120SC1	N(V)TH4L160N120SC1	N(V)TBG160N120SC1

All OPNs will be automotive qualified

✓ Device in green- in RTM

IGBT– 应用市场

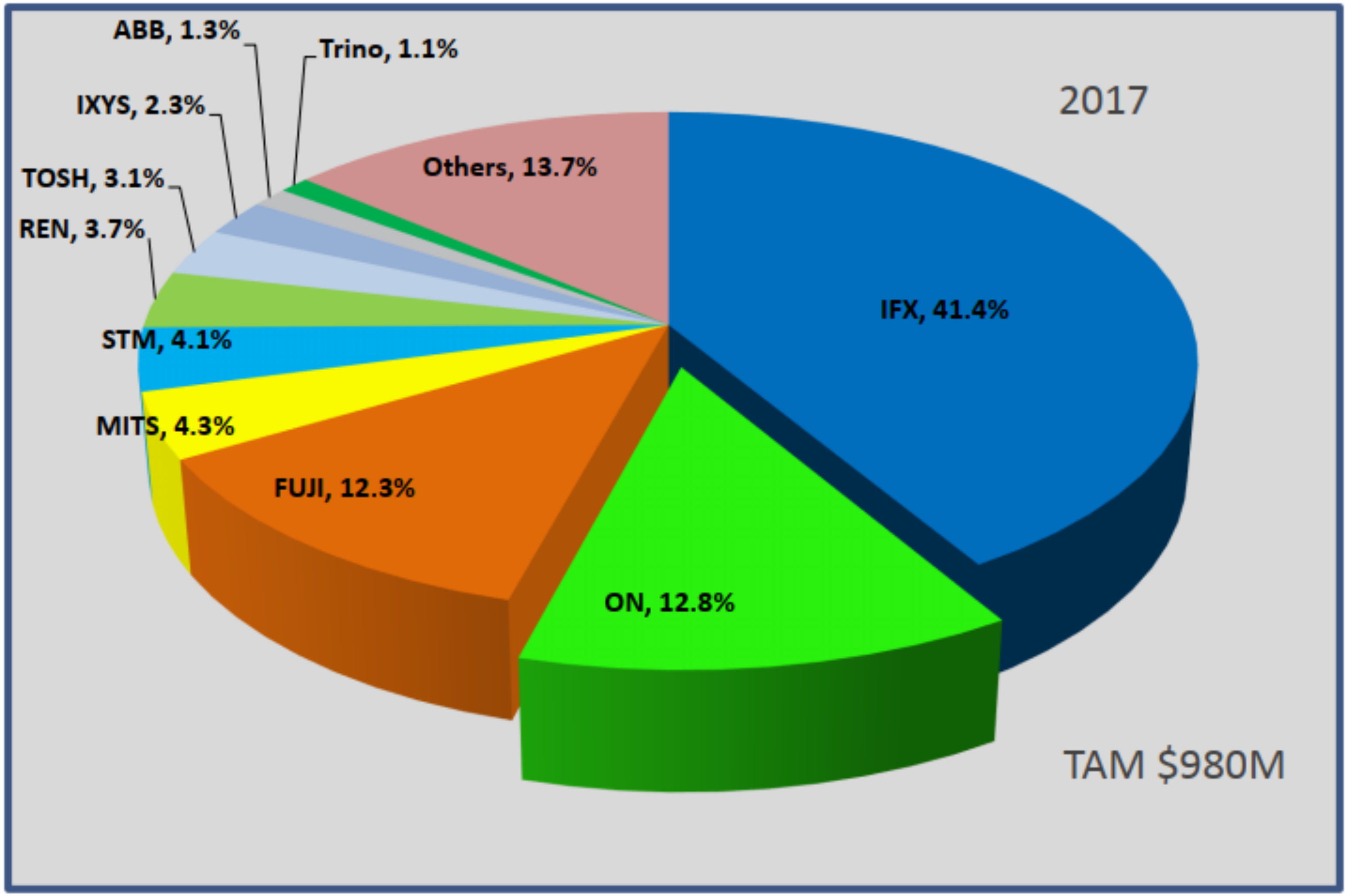
家电

光伏逆变

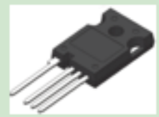
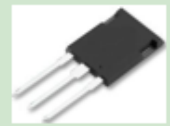
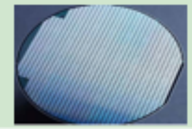
工业马达

电动汽车及其充电桩

IGBT– 安森美半导体市场占有率

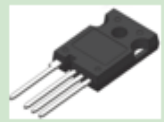
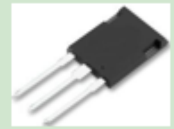
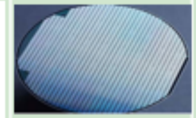


IGBT 产品

Spec				TO247-3L		TO247-4L	Power247-3L	Bare Die	Application							
Voltage / Current @Tc=100℃	V_{CE_SAT} / E_{OFF} (uJ/A) @Tc=25℃	IGBT Type	Copak Diode rating						Automotive	EV-Charger	Solar	UPS	IH	Welder	Room AC (PFC)	Motor Control
650 / 75	1.60 / 5	FS4 HS	half	FGH75T65SQD_F155	High Speed			PCFG75T65SQF		V	V	V				
650 / 75	1.60 / 5	FS4 HS	full/high Qrr	FGH75T65SQDT_F155		FGH75T65SQDTL4 High Speed				V	V	V				
650 / 75	1.60 / 5	FS4 HS	full/low Qrr			FGH75T65SQDNL4 High Speed										
650 / 75	1.10 / 24	FS4 LS	full	FGHL75T65LQDN (Q4 '19/Q1 '20)	Low $V_{CE(SAT)}$			PCFG75T65MQF			V	V				
650 / 75	1.45 / 16	FS4 MS	full	FGHL75T65MQDN (Q3 '19/Q4 '19)	Mid Speed			PCFG75T65LQF			V	V				
650 / 60	1.60 / 5	FS4 HS	half	FGH60T65SQD-F155	High Speed					V	V	V				
650 / 50	1.60 / 5	FS4 HS	half	FGH50T65SQD_F155	High Speed			PCFG50T65SQF		V	V	V				
650 / 50	1.60 / 5	FS4 HS	n/a	FGHL50T65SQ	High Speed											
650 / 40	1.60 / 5	FS4 HS	half	FGH40T65SQD_F155	High Speed			PCFG40T65SQF		V	V	V				
950 / 75	1.69 / 26	FS4 HS	75			High Speed	FGY75T95SQD (Q1'19/Q2 '19)	PCFG75T95SQW (IGBT) PCFF75EF95W (FRD)			V	V				
950 / 75	1.31 / 64	FS4 LS	75			Low $V_{CE(SAT)}$	FGY75T95LQD (Q1'19/Q2'19)	PCFG75T95LQW (IGBT) PCFF75EF95W (FRD)			V	V				

GREEN: Released
Blue: Under development
(CS sample / RTM schedule)

FSIII UFS IGBT 产品

Spec					TO247-3L	TO247-4L	Power247-3L	Power247-4L	Bare Die	Application							
Voltage / Current @Tc=100℃	V_{CE_SAT} / E_{OFF} (uJ/A) @Tc=25℃	IGBT Type	SC rated	Reverse Diode						Automotive	EV-Charger	Solar	UPS	IH	Welder	Room AC (PFC)	Motor Control
1200 / 75	1.7 / 27	UFS HS	No	Full / fast switching/ soft RR			FGY75T120SQDN	FGY75T120SQDNL4 (TBD/TBD)	PCFG75T120SQF		V	V	V				
1200 / 75	1.7 / 37	UFS SC	Yes	Full / Low Vf			FGY75XXXXXQDN (TBD '20/TBD '20)				V	V	V				V
1200 / 40	1.7 / 27	UFS HS	No	Full / fast switching/ soft RR	NGTB40N120FL3	FGH40T120SQDNL4			PCFG40T120SQF		V	V	V				
1200 / 40	1.7 / 27	UFS HS	No	Full / Low Vf	NGTB40N120S3						V	V	V		V		
1200 / 40	1.55 / 37	UFS LS	No	Full / fast switching/ soft RR	NGTB40N120L3						V	V	V				
1200 / 40	1.7 / 37	UFS SC	Yes	Full / Low Vf	FGHL40TXXXXXDN (2H '20/TBD '20)						V	V	V				V
1200 / 25	1.7 / 27	UFS HS	No	Full / fast switching/ soft RR	NGTB25N120FL3				PCFG25T120SQF		V	V	V				
1200 / 25	1.7 / 37	UFS SC	Yes	Full / Low Vf	FGHL25TXXXXXDN (TBD '20/TBD '20)						V	V	V				V

GREEN: Released
Blue: Under development
(CS sample / RTM schedule)

IGBT– 命名规则

A F G H 75 T 65 S Q D N L4

- **Package Option**: L4 : 4 pin solution / -F155 : TO247 3L long lead (old products)
- **Co-pack Diode Option**: Blank : half of rated I_C / F : half & Low V_F / T : full rating / N : ON tech
- **Existing or Non-existing of built-in Diode**: Blank : without Diode / D : Built-in Diode
- **Generation**: U, F : Gen1 / M : Gen2 / H : FS3 / P, C : FS1 or FS3 SCR / Q : FS4 or UFS (FSIII)
- **Speed & Feature**: S : High Speed / U : Soft switching(FS4) or Mid speed(FS1); L : Low $V_{CE(sat)}$ / M : Mid Speed / R : Short Circuit Ruggedness
- **Voltage Rating (x 10)**
- **Technology**: N : Planar process / T : Trench process (cf. 1200V Gen1 : N); S : Shorted Anode (Reverse Conducting)
- **Current Rating**
- **Package Type**:
  P : TO-220 / PF : TO-220F / A : TO-3PN / AF : TO-3PF
  H : TO-247 / HL : TO-247 long lead / Y : Power247 / L : TO-264
  D : D-PACK / B : D²-PACK / U : I-PACK / I : I²-PACK
- **IGBT**
- **ONsemi + Fairchild**
- **Product Grade**: Blank : non-Auto / A : AEC Qualified / *-F085 : AEC Qualified (old products)

PIM (功率集成模块)-应用市场

EV 充电桩 | 光伏逆变 | UPS

PIM-封装类型

Q0

Q1

Q2

with base plate

PIM- 1200V/40A Boost 模块

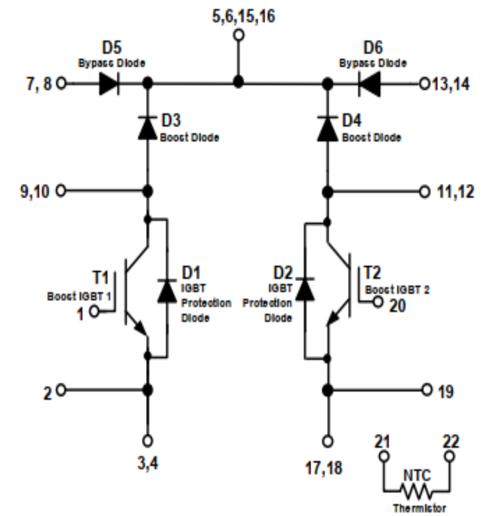
Features

- Dual Boost Module Family
  - 40A/1200V IGBT + Si Diode
  - 40A/1200V IGBT + SiC Diode
  - Full SiC module planned
- 25 A/1600 V Bypass and Anti−parallel Diodes
- Solderable Pins
- Thermistor

Benefits

- Easy mounting
- Improved efficiency over competitor product

Block Diagram



Specifications

Product	Description	Status
NXH80B120L2Q0SG	40A/1200V IGBT, 30A/1200V Si Boost	Samples Q3 18
NXH80B120H2Q0SG	40A/1200V IGBT, 15A/1200V SiC Boost	Released
Full SiC version		In development

Applications

- Industrial Applications

End products

- Solar Inverter

Package

Q0BOOST

PIM—T型NPC 模块

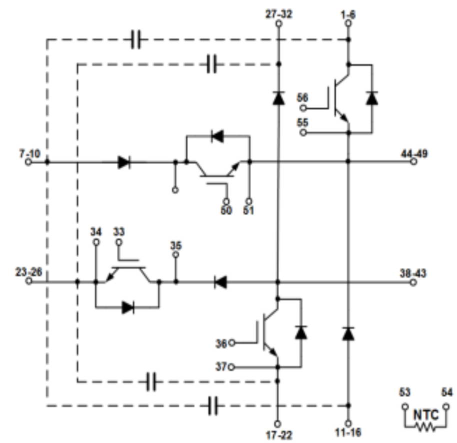
Features

- High-speed 80A/1200V IGBT
- High-speed 50A/650V IGBT
- Built-in NTC

Benefits

- Easy mounting
- Improved efficiency over competitor product
- Supports reactive power

Block Diagram



Split T-Type in Q2 Package

Specifications

Product	Description	Configuration	Options
NXH80T120L2Q0S2G/P2G	80A/1200V IGBT, 50A/650V IGBT T-Type NPC Three-level Inverter	T-Type NPC	TIM/ no TIM Solder/ press-fit pins
NXH160T120L2Q1PG/SG	160A/1200V IGBT, 100A/600V IGBT Split T-Type NPC	Split T-Type NPC	TIM/ no TIM Solder/ press-fit pins
NXH160T120L2Q2F2SG	160A/1200V IGBT, 100A/600V IGBT Split T-Type NPC	Split T-Type NPC	Solder pins
NXH160T120L2Q2F2S1G	160A/1200V IGBT, 100A/650V IGBT Split T-Type NPC	Split T-Type NPC	Solder pins

End products

- Solar Inverter
- UPS

Package

Q0PACK

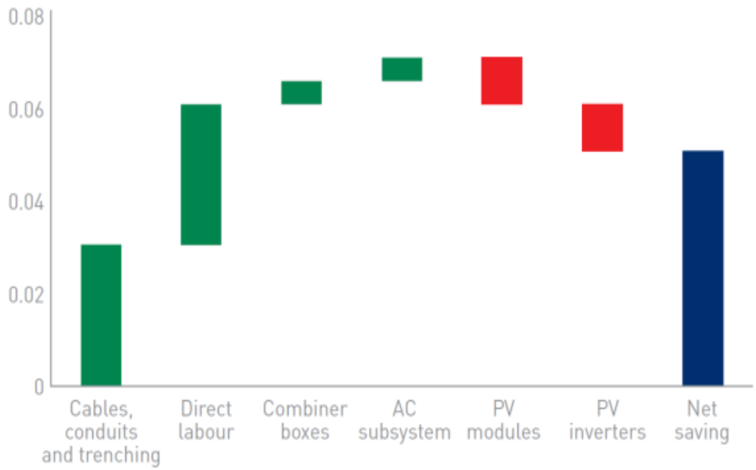
Q1PACK

Q2PACK

PIM- 1500V 母线系统应用模块

-1500V 系统的优势

Cost savings for 1,500 V system in comparison to 1,000 V systems, USD/W



Source: GTM Research

i. Reduced power losses – Shifting to 1,500 V systems reduces DC power losses by 33%[2];

ii. Infrastructure cost saving – due to higher number of modules in the string, number of combiner boxes and length of DC cable is reduced;

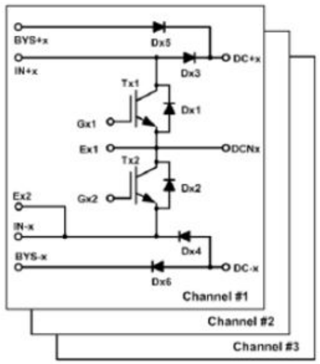
iii. Lower installation time and cost – due to fewer equipment installation;

- ❑ **About 5% of total capital cost can be saved with 1500V system compared with 1000V system**
- ❑ **IHS has a forecast on international market share of 1500 V systems to rise from 6% in 2016 to 50% by 2020.**

PIM- 1500V 系统应用模块推荐

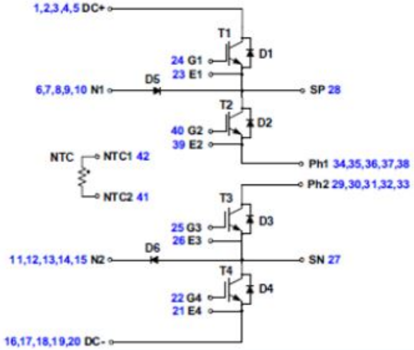
Available Modules – 1500V three-level inverter and boost modules (1000 V IGBT)

- Customer provide power level of dc-dc boost. For example, a 200 kW three-phase system used 3 boost modules, each MPPT handles 200,000/3/3=22.2kW



Boost module #	Number of MPPT	IGBT rating
NXH450B100H4Q2F2SG/PG	3	150A

- Customer provide power level of inverter. For example, a 200 kW three-phase system used 3 inverter modules, each module handles 200,000/3 = 66.7kVA.



Inverter module #	Topology	IGBT rating
NXH350N100H4Q2F2SG/PG	INPC	350A

MOSFET 驱动--低边驱动产品

Type	Product	Configuration	In. Thres.	Package
Single 1A	FAN3111	Dual Input (CMOS); Non-Inv (Ext)	CMOS, Ext	SOT23-5
Single 2A	FAN3100	Dual Input (+ & -)	CMOS, TTL	SOT23-5, MLP-6
	FAN3180	Single Non-Inverting, 3V3 LDO	TTL	SOT23-5
	FAN3181	Single Non-Inverting, OCP, Desat, Active Miller Clamp	TTL	SOIC-8
Dual 2A	FAN3216	Dual Inverting	TTL	SOIC-8
	FAN3217	Dual Non-Inverting	TTL	SOIC-8
	FAN3226	Dual Inverting + Dual Enable	CMOS, TTL	SOIC-8, MLP-8
	FAN3227	Dual Non-Inverting + Dual Enable	CMOS, TTL	SOIC-8, MLP-8
	FAN3229	Dual Input (+ & -)	CMOS, TTL	SOIC-8, MLP-8
Dual 4A	FAN3213	Dual Inverting	TTL	SOIC-8
	FAN3214	Dual Non-Inverting	TTL	SOIC-8
	FAN3223	Dual Inverting + Dual Enable	CMOS, TTL	SOIC-8, MLP-8
	FAN3224	Dual Non-Inverting + Dual Enable	CMOS, TTL	SOIC-8, MLP-8
	FAN3225	Dual Input (+ & -)	CMOS, TTL	SOIC-8, MLP-8
Single 9A	FAN3121	Single Inverting + Enable	CMOS, TTL	SOIC-8, MLP-8
	FAN3122	Single Non-Inverting + Enable	CMOS, TTL	SOIC-8, MLP-8
Bridge 2A	FAN3268	20V Bridge Driver + Dual Enables	TTL	SOIC-8
	FAN3278	30V Bridge Driver + Dual Enables	TTL	SOIC-8

CMOS=VDD ration thresholds(Approximately 38% and 55%)

Ext= thresholds proportional to an external reference voltage

MOSFET 驱动--高压驱动产品

Type	Product	In - Out	Offset Voltage (V)	Output Current		Delay Time		Shut Down	OCP	DT(ns)	PKG
				SRC (mA)	SNK (mA)	Ton (ns)	Toff (ns)				
High & Low-Side	FAN7382	2 to 2	600	350	650	170	200	No	No	No	8DIP, 8SOP, 14SOP
	FAN7390	2 to 2	600	4500	4500	140	140	No	No	No	8SOP, 14SOP
	FAN7390A	2 to 2	600	4500	4500	140	140	No	No	No	14SOP
	FAN73901	2 to 2	600	2500	2500	140	140	No	No	No	8SOP
	FAN7391	2 to 2	600	4500	4500	150	150	No	No	No	14SOP
	FAN7392	2 to 2	600	3000	3000	130	150	Yes	No	No	16 WSOP
	FAN7842	2 to 2	200	350	650	170	200	No	No	No	8SOP
	FAN8811	2 to 2	100	3000	6000	30	28	No	No	No	10WDFN
	NCP5106A	2 to 2	600	250	500	100	100	No	No	No	8DIP, 8SOP, 10DFN
	NCP5109A	2 to 2	200	250	500	100	100	No	No	No	8SOP, 10DFN
	NCP5181	2 to 2	600	1400	2200	100	100	No	No	No	8DIP, 8SOP
	NCP5183	2 to 2	600	4300	4300	120	120	No	No	No	8SOP
	NCP51530B	2 to 2	700	3500	3000	25	25	No	No	No	8SOP, 10DFN
Half Bridge	TND525SS	2 to 2	600	200	400	100	100	No	No	No	8SOP
	FAN7380	2 to 2	600	90	180	135	130	No	No	100	8SOP
	FAN7383	1 to 2	600	350	650	500	170	Yes	No	Variable	14SOP
	FAN7387	1 to 2	600	350	650	550	160	Yes	No	Variable	8SOP
	FAN73832	1 to 2	600	350	650	580	180	Yes	No	Variable	8SOP
	FAN73833	2 to 2	600	350	650	150	140	No	No	450	8SOP
	FAN7384	2 to 2	600	250	500	180	170	Yes	Yes	120	14SOP
	FAN73912	2 to 2	1200	2000	3000	500	550	Yes	No	330	16 WSOP

Type	Product	In - Out	Offset Voltage (V)	Output Current		Delay Time		Shut Down	OCP	DT(ns)	PKG
				SRC (mA)	SNK (mA)	Ton (ns)	Toff (ns)				
Half Bridge	FAN7393A	1 to 2	600	2500	2500	530	130	Yes	No	Variable	14SOP
	FAN73932	1 to 2	600	2500	2500	600	200	Yes	No	400	8SOP
	FAN73933	2 to 2	600	2500	2500	160	160	No	No	Variable	14SOP
	FL73282	2 to 2	900	350	650	150	150	No	No	170	8SOP
	NCP1392B	1 to 2	600	500	1000	N/A	N/A	No	No	610	8SOP
	NCP1392D	1 to 2	600	500	1000	N/A	N/A	No	No	305	8SOP
	NCP1393B	1 to 2	600	1000	1500	N/A	N/A	No	No	610	8SOP
	NCP5104	1 to 2	600	250	500	620	100	Yes	No	520	8DIP, 8SOP
	NCP5106B	2 to 2	600	250	500	100	100	No	No	100	8DIP, 8SOP, 10DFN
	NCP5109B	2 to 2	200	250	500	100	100	No	No	100	8SOP, 10DFN
	NCP5111	1 to 2	600	250	500	750	100	No	No	650	8DIP, 8SOP
	NCP5304	2 to 2	600	250	500	100	100	No	No	100	8DIP, 8SOP
3-Phase Half-Bridge	FAN7388	6 to 6	600	350	650	130	150	No	No	270	20SOP
	FAN7389	6 to 6	600	350	650	500	500	Yes	Yes	300	28SOP
	FAN73892	6 to 6 (inverting)	600	350	650	500	500	Yes	Yes	290	28SOP
	FAN73893/4	6 to 6 (inverting)	600	350	650	500	500	Yes	Yes	320	28SOP
	FAN73895/6	6 to 6	600	350	650	500	500	Yes	Yes	320	28SOP
	FAN7888	6 to 6	200	350	650	130	150	No	No	270	20SOP
WBG	NCP51705	1 to 1	-	6000	6000	25	25	Yes	Yes	Adj	24QFN
	NCP51820	2 to 2	650	1000	2000	25	25	Yes	No	Adj	15QFN

明星产品介绍(1)– SiC MOSFET 驱动/NCP/NCV51705

Value Proposition

The NCV51705 driver is designed to primarily drive SiC MOSFET transistors. For the lowest possible conduction losses, the driver is capable to deliver the maximum allowable gate voltage to the SiC MOSFET device. For improved reliability, dV/dt immunity and even faster turnoff, the NCV51705 can utilize its on-board charge pump to generate a user selectable negative voltage rail.

Unique Features

- Adjustable, on-board regulated negative charge pump
- Negative voltage drive for fast turn-off (same as above)
- 5V Reference/Bias Rail
- Adjustable UVLO levels

Benefits

- Simplified BOM and no need for extra DC/DC
- AEC-Q100 with Grade 1 Temperature Range(NCV51705)
- Easy digital isolator Vcc supply
- Can work with diff SiC FET's

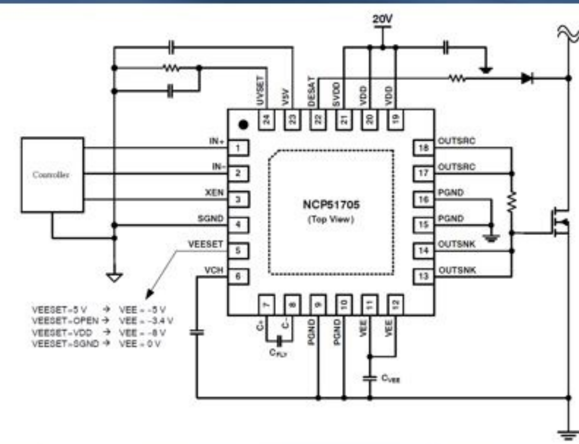
Other Features

- High peak output current - 6A
- Extended positive voltage rating for efficient SiC MOSFET operation during the conduction period
- Thermal shutdown function
- DESAT detection for short circuit protection
- Inverting/Non-inverting Input

Market & Applications

- Driving SiC MOSFET (NCV51705 for Automotive Applications)
- Inverters, Converter, and Motor Drivers
- High Performance PFC, AC/DC and DC/DC Converters

Typical Application Schematic



Package Information

RTM Product

QFN-24 QFNW-24

- NCP51705MNTXG : QFN-24 4mm x 4mm
- NCV51705MNTXG : Wettable Flank QFNW-24 4mm x 4mm

明星产品介绍(2)– GaN MOSFET 半桥驱动/ NCP51820

Value Proposition

NCP51820 driver is designed to meet the stringent requirements of driving GaN power switches in off-line applications half-bridge topologies. It offers short and matched propagation delays. Advanced level shift technology provides -3.5 V to +650 V (typical) common mode voltage range operation for the high side gate driver and -3.5 V to +3.5 V common mode voltage range for the low side gate driver. Latest generation common-mode noise canceling technique provides stable operation up to 200 V/ns dV/dt rating for both driver output stages.

Unique Features

- 650 V, High and Low Side Drive
- Typical 1 A/2 A Source/Sink Current
- 1 ns Rise and Fall Time
- 200 V/ns dV/dt Immunity
- Regulated Gate Drive Amplitude: 5.2 V

Benefits

- Enables ultra high density design
- Efficient switching of GaN for ultra high efficiency
- Reliable operation

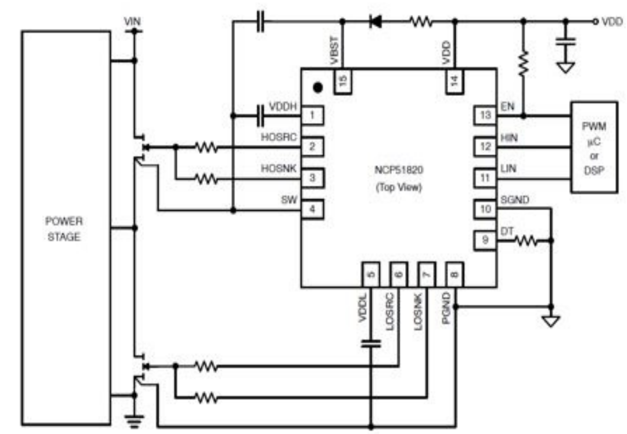
Other Features

- Independent UVLO Protections for High and Low Side Drivers
- Separated Driver Output Stages
- SW and PGND Withstands Negative Voltage Transient up to 3.5 V below SGND
- Max Propagation Delay of 50 ns
- Shoot-Through Prevention, Adjustable Dead-time, TSD
- MLP-20L 4mm x 4mm package

Market & Applications

- Low to medium power Ultra High Density SMPS

Typical Application Schematic



Package Information

QFN-15

- NCP51820MNTXG : QFN-15 4mm x 4mm

RTM Product

MOSFET 驱动—应用市场

Appliance

Heat Pump, Motor Inverter, IH

FAN7380
FAN7382
FAN7383
FAN7384
FAN7388
FAN73833
FAN7392
FAN7393
FAN7389/2
FAN73893/4/5/6
FAN73912

Industrial

Sewing Machine, Pump, Power Tool

FAN7390
FAN7380
FAN7382
FAN7383
FAN7384
FAN7388
FAN7392
FAN7393
FAN73932
FAN7390A
FAN73893/4/5/6
NCP51530
NCP51705

E-Bike, Scooter

BLDC Inverter

FAN7380
FAN7382
FAN7383
FAN7384
FAN7388
FAN7888
FAN73833
FAN7389
FAN7389/2
FAN73893/4/5/6
FAN8811

Power Supply

DC-DC Converter

FAN7361
FAN7371
FAN7382
FAN7390
FAN73832
FAN7392
FAN7393
FAN73932
FAN73933
FAN7393A
FAN7390A
FAN8811
NCP51820

Automotive

Motor Inverter, PTC Heater

NCV51511
NCV51705
NCV51542
NCV5183
NCV5160

Robotics

3-Phase Motor

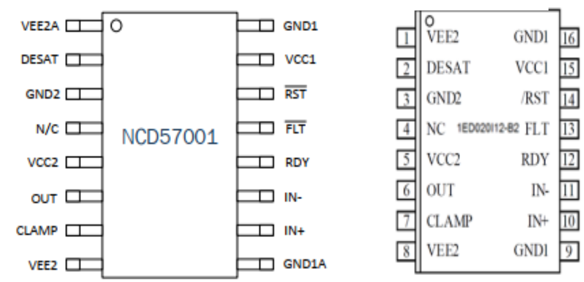
FAN73893/4/5/6
FAN73901
NCP51530

IGBT 驱动

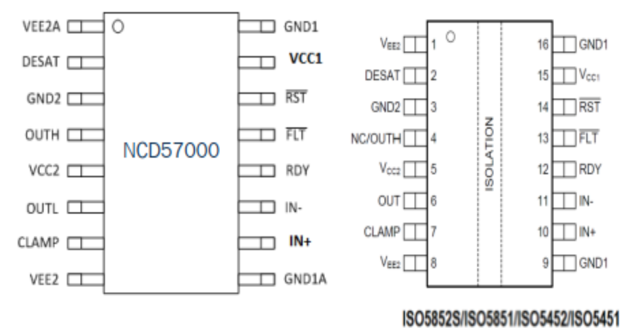
- NCD(V)57000/01 16-pin 宽体隔离驱动

Parameter	Digital Isolated Drivers				Opto-Drivers
	ON NCD57000	Competitor I Product I	Competitor T Product T	Competitor A1 Product A1	Competitor A2 Product A2
Source Current	7.8Apk	2Apk	2.5Apk	4Apk	2.5Apk
Sink Current	7.1Apk	2Apk	5Apk	4Apk	2.5Apk
Prop. Delay	66ns	170ns	76ns	55ns	180ns
Delay Distortion (tpdoff-tpdon)	15ns	25ns	20ns	15ns	150ns
Isolation Voltage	5 KV	4.5 KV	5.7 KV	5 KV	5 KV
CMTI	100kV/us	50kV/us	100kV/us	100kV/us	50kV/us
Operating Temp	+125	+105	+125	+125	+105

P2P w/ Competitor I



P2P w/ Competitor T



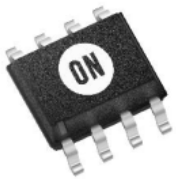
IGBT 驱动

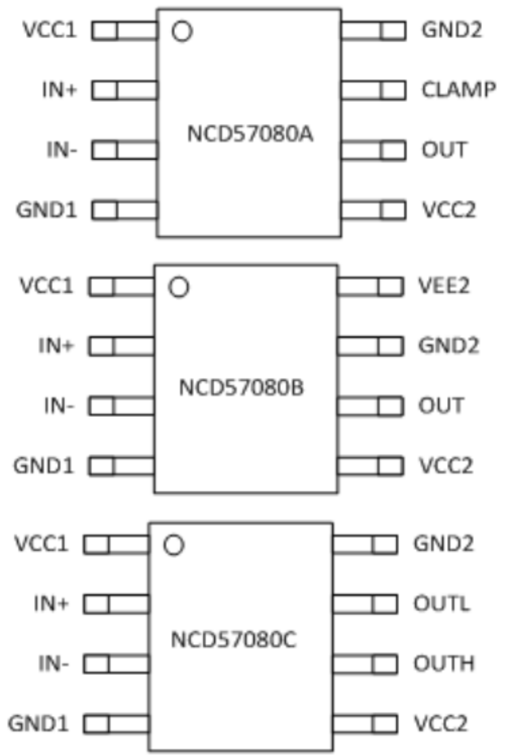
- NCD(V)57080A/B/C 8-pin 窄体隔离驱动

Features

- High current (4.0 A/6.0 A src/snk) at Miller Plateau Voltage
- Galvanic Isolation up to 3.75 kV
- CMTI > 100kV/us @ 1500V
- Typical 60ns propagation delays
- Miller clamp, Negative gate voltage, Split output options
- Tight UVLO for IGBT safety

Sampling now.
RTM in Dec 2019
P2P w/ Competitor T, I & A





Market & Applications

Solar Inverters, Motor Drive, UPS
EV Chargers, Automotive Power Supplies

Packages/Options

SOIC-8 Narrow Body

IGBT 驱动

- NCD(V)57090 8-pin 宽体隔离驱动

Features

- High current (4.0 A/6.0 A src/snk) at Miller Plateau Voltage
- Galvanic Isolation up to 5 kV
- CMTI > 100kV/us @ 1500V
- Typical 60ns propagation delays
- Miller clamp, Negative gate voltage,

  Split output options
- Tight UVLO for IGBT safety

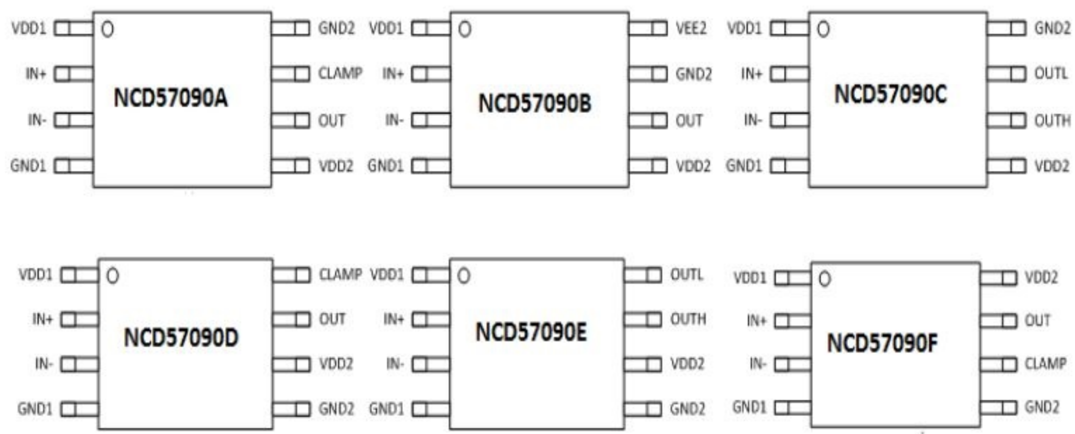
Market & Applications

Solar Inverters, Motor Drives, UPS
Automotive power supplies, EV Chargers

Packages/Options

SOIC-8 Wide Body

Sampling now.
RTM in Dec 2019
P2P w/ Competitor
T, I & A



IGBT 驱动

-NCD(V)57252 双通道隔离驱动

Features

- High current (4.0 A/6.0 A src/snk) at Miller Plateau Voltage
- Galvanic Isolation up to 5 kV
- CMTI > 100kV/us @ 1500V
- Typical 60ns propagation delays
- Tight UVLO for IGBT safety
- 3.3V, 5V, and 15V Logic inputs
- Configurable for Dual Low-side, Dual high-side or Half-bridge

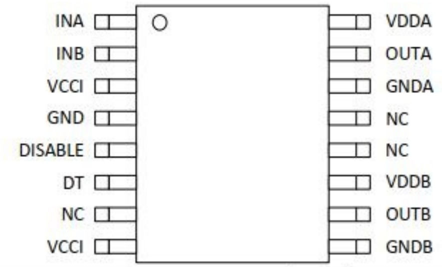
Sampling now.
RTM in Dec 2019
P2P w/ Competitor T & S

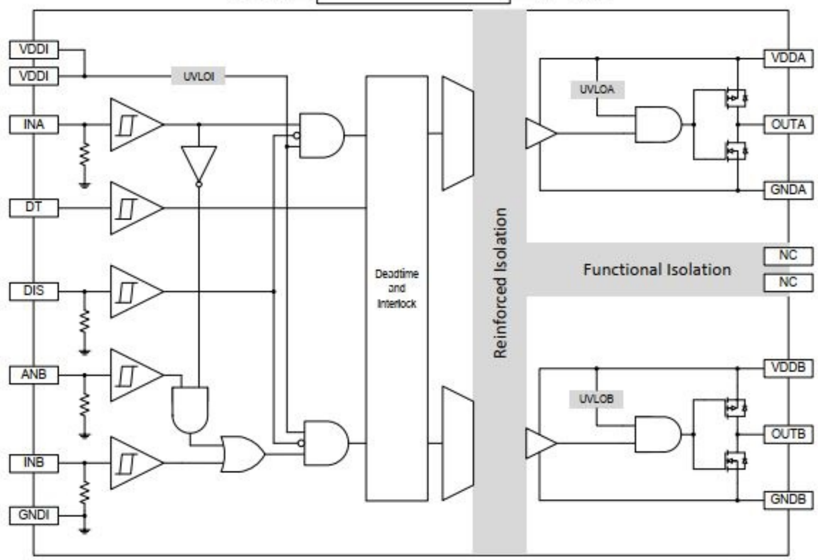
Market & Applications

OBC, EV Chargers, Solar Inverters, Motor Drives,
UPS, Automotive power supplies,

Packages/Options

SOIC-16 Wide Body





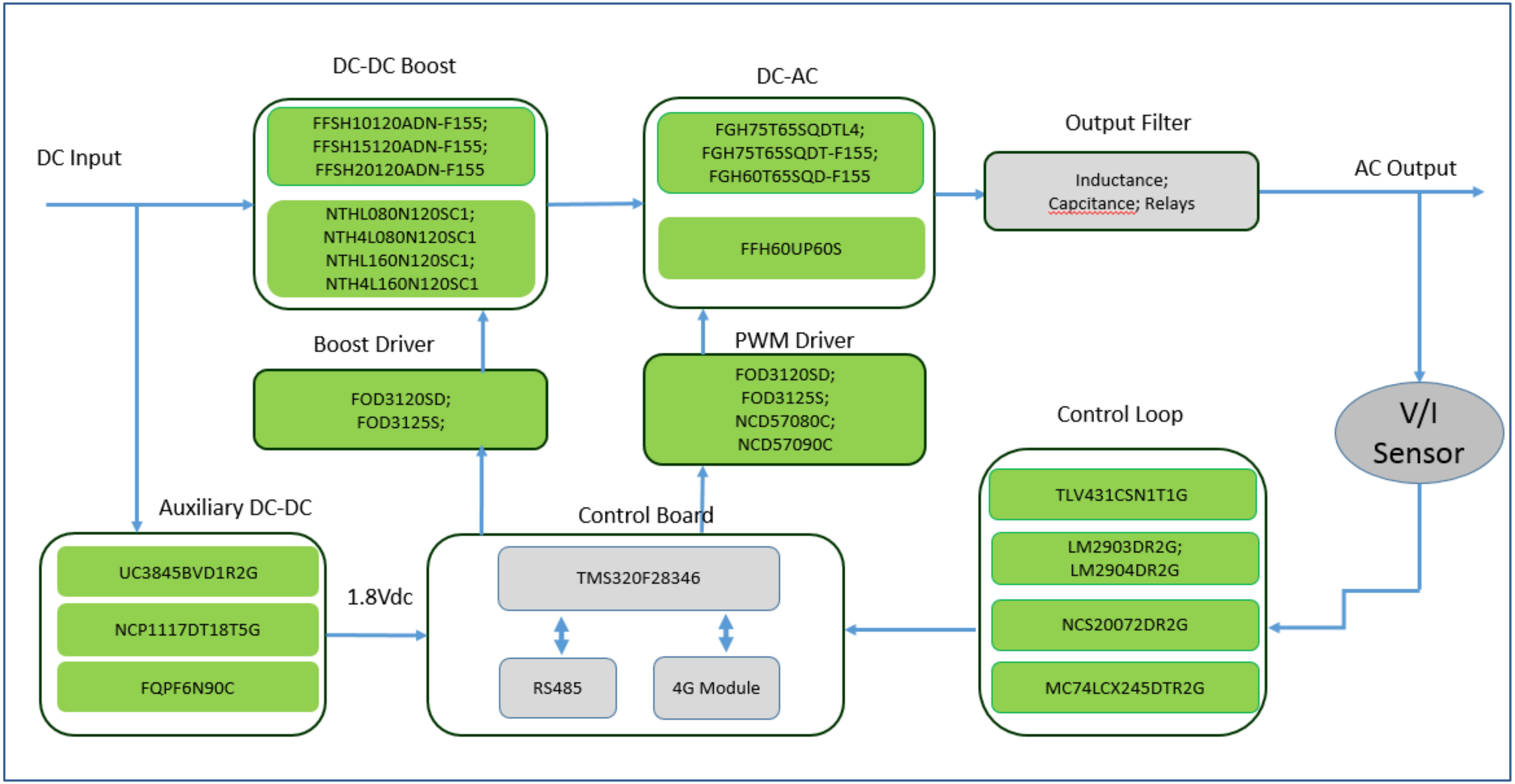
IGBT 驱动

-选型指引

	Specs/Features							Target Applications								
								Automotive				Industrial/Consumer				
	No. of channels	Isolation	Differential Input	DESAT w/ FLT	Miller Clamp	VEE	Split output	Traction	PTC	OBC	HV DC-DC	IH	UPS	Solar	Motor Control	HVAC
NCDV)5700/2	1			V	V	V	V	V	V							
NCD(V)5701/3A	1			V	V			V	V	V	V	V	V		V	
NCD(V)5701/3B	1			V		V		V	V	V	V	V	V		V	
NCD(V)5701/3C	1			V			V	V	V	V	V	V	V		V	
NCD(V)57000/1	1	V	V	V	V			V	V					V	V	V
NCD(V)57080A	1	V	V		V					V	V	V	V			
NCD(V)57080B	1	V	V			V				V	V	V	V			
NCD(V)57080C	1	V	V				V			V	V	V	V			
NCD(V)57090A	1	V	V		V								V	V	V	V
NCD(V)57090B	1	V	V			V							V	V	V	V
NCD(V)57090C	1	V	V				V						V	V	V	V
NCD(V)57084	1	V		V					V				V			
NCD(V)57085	1	V		CS w/FLT					V				V			
NCD(V)57252	2	V								V	V			V		V
NCD(V)57200/1	2									V	V	V	V			V

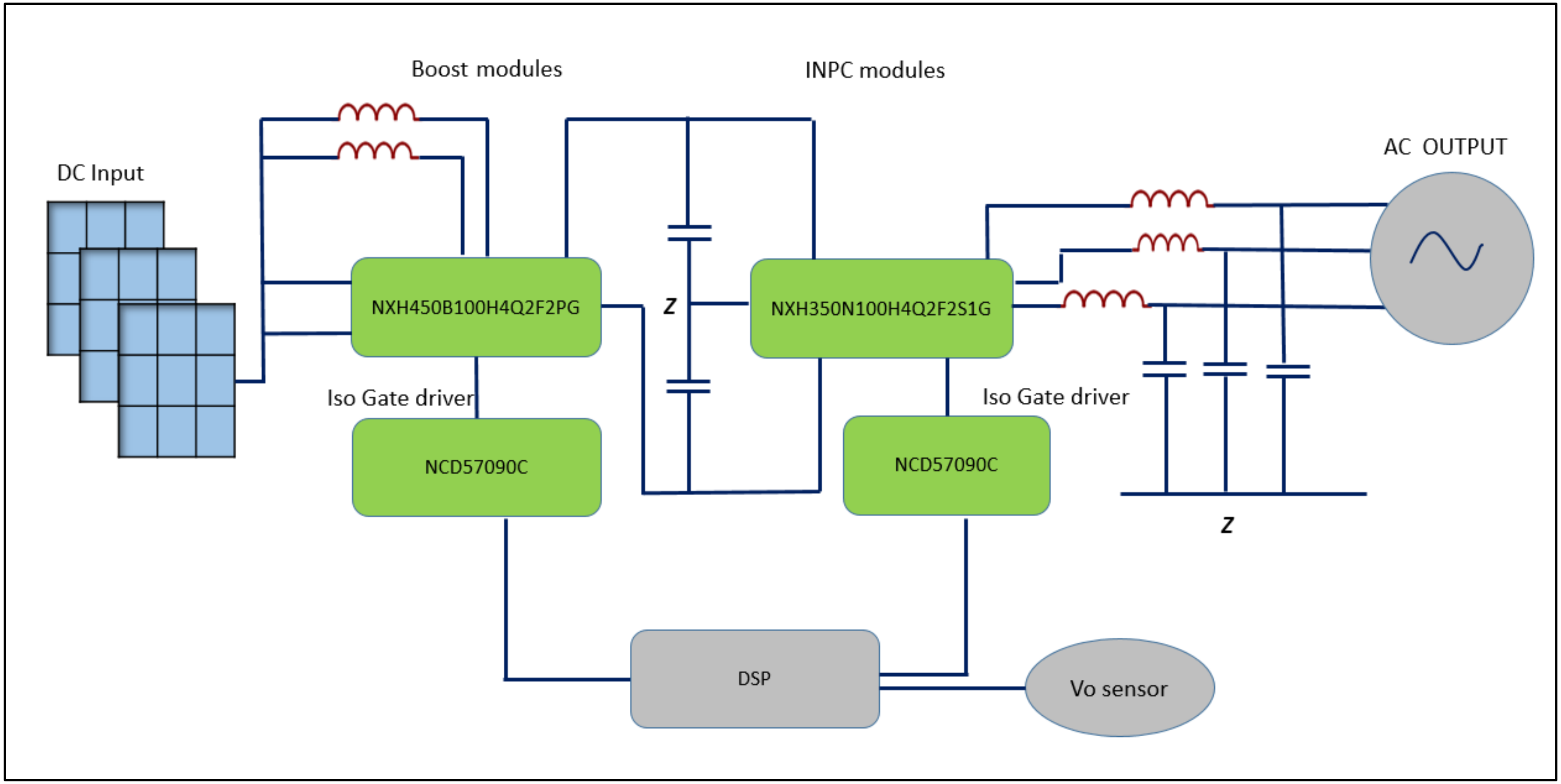
成功案例(1)

- 光伏逆变器--分立器件解决方案 (20KW~80KW)



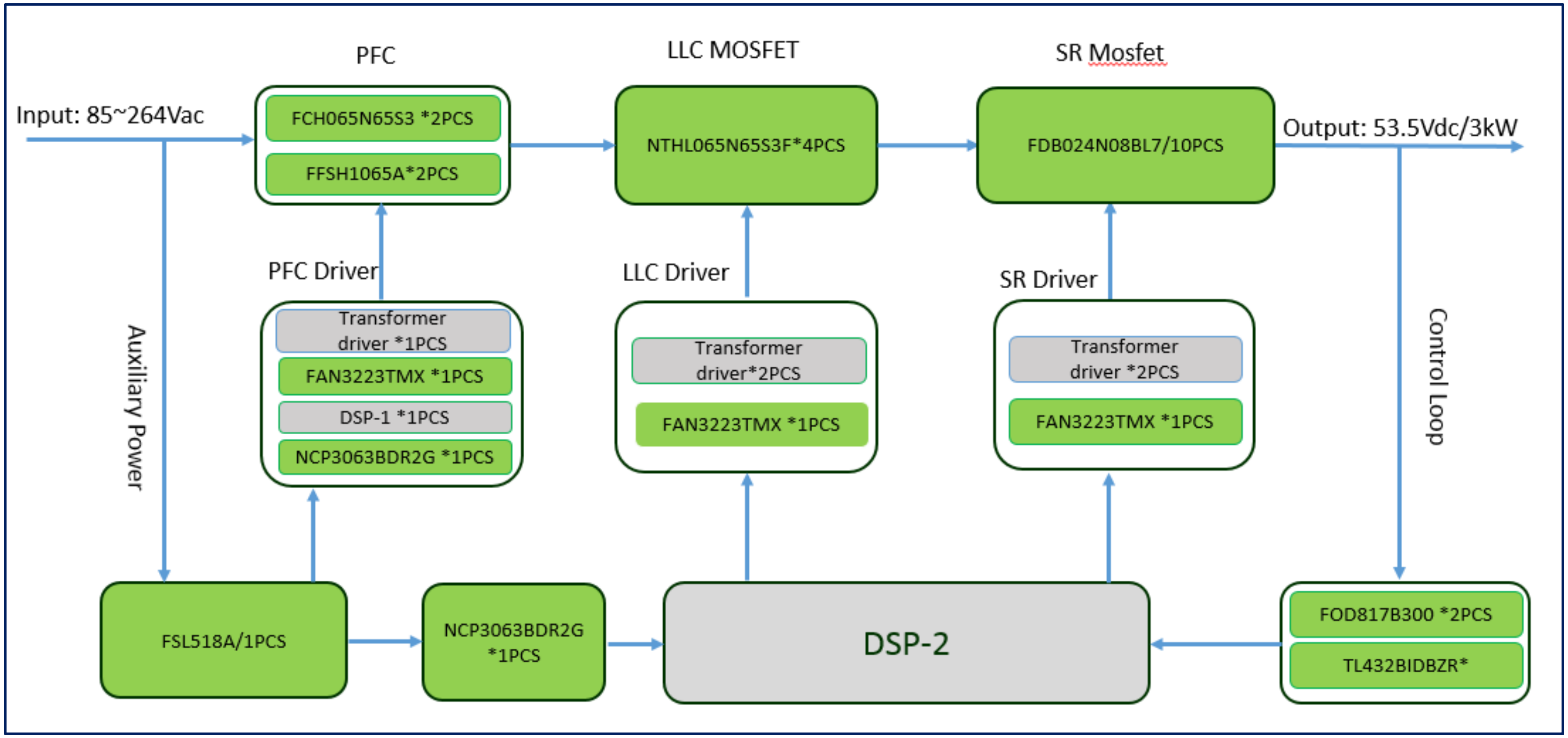
成功案例(2)

- 光伏逆变器—模块解决方案 (220KW,1500V 母线系统)



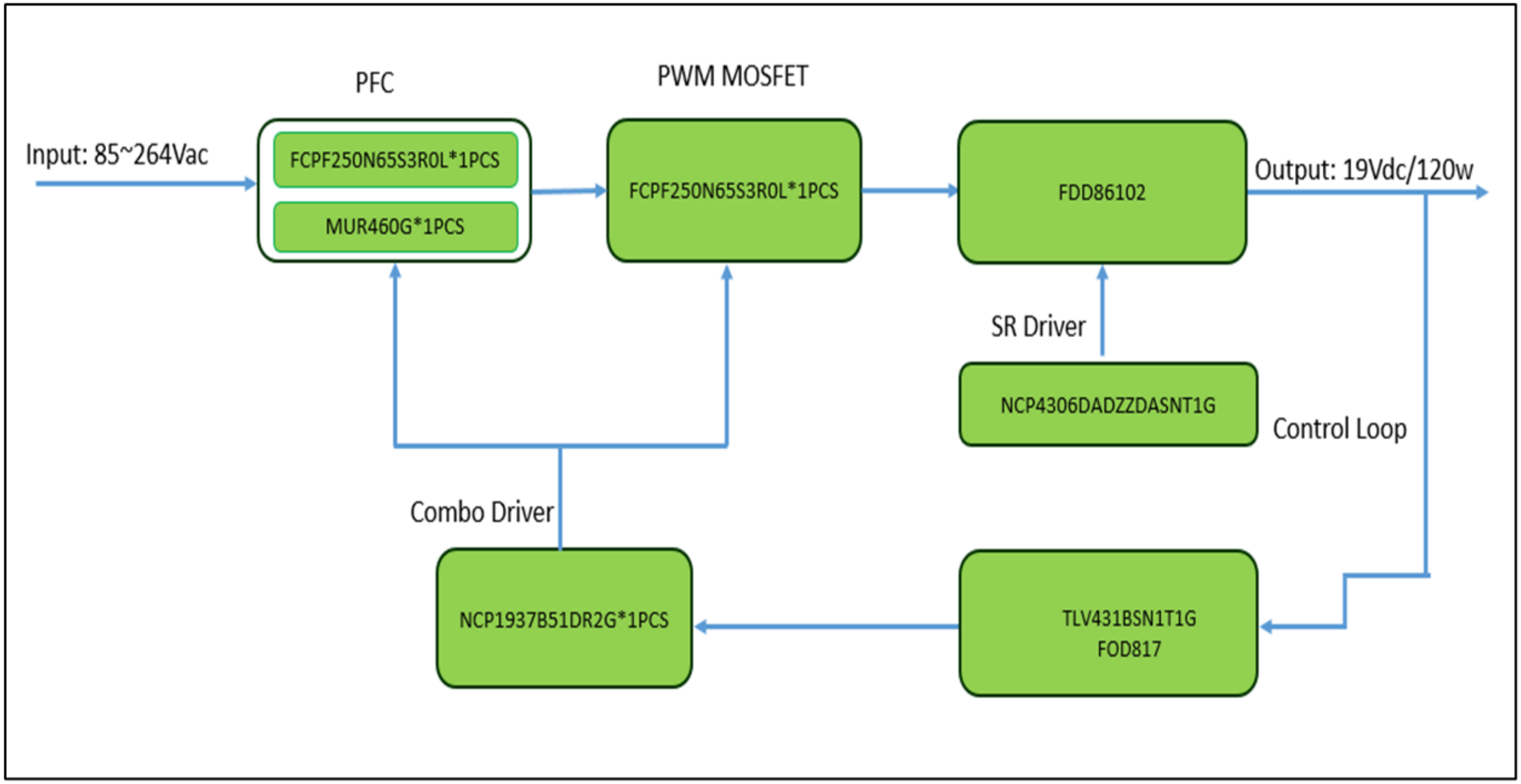
成功案例(3)

- 5G 基站电源



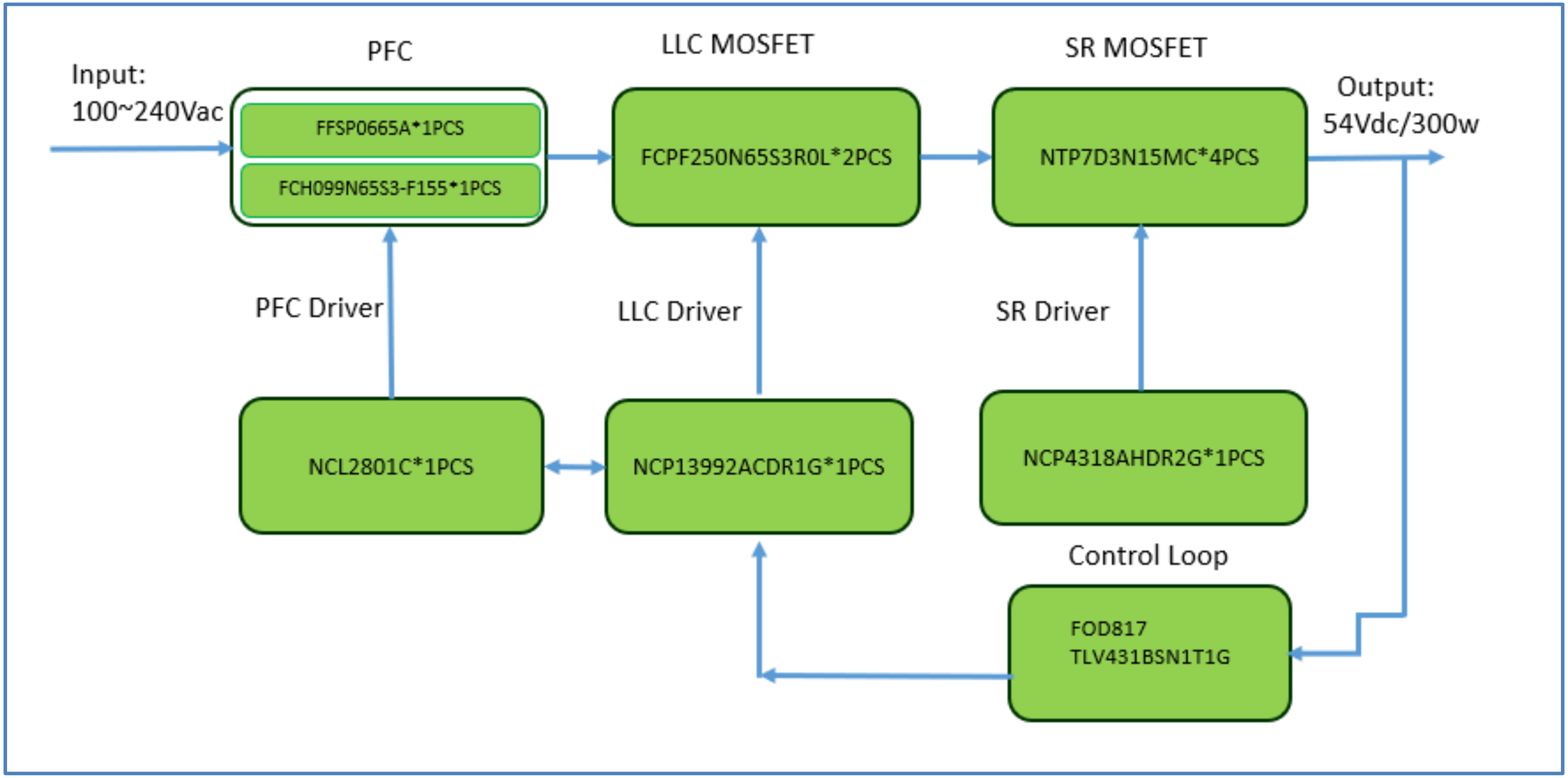
成功案例(4)

-显示器适配器



成功案例(5)

- 300W LED 驱动



更多信息访问

✓ 安森美半导体网站

- www.onsemi.cn

✓ 产品手册

-电源和电源适配器解决方案手册

✓ 安森美半导体官方微信号

-最新资讯及产品信息

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- ✓ 实验室EMI测试支持

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谢 谢