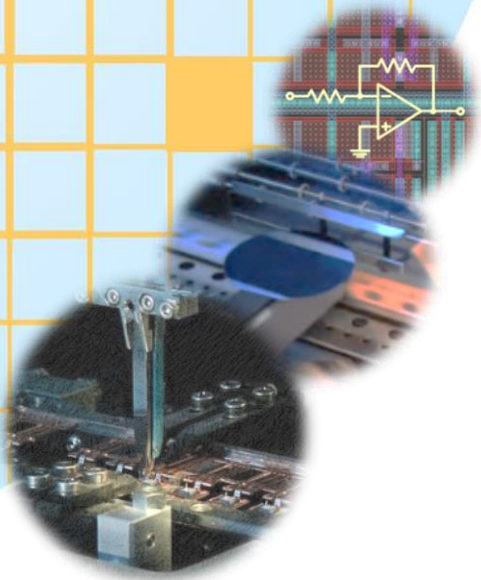




Unisonic Technologies

Product Introduction

Gary Chang
Aug. 2024



IC (Integrated Circuit)

◆ **Power Management IC**

- » **Voltage regulator** » CC/CV ctrl.
- » Power / LED solution » PWM ctrler.
- » Reset / watchdog IC » Protection IC

◆ **Analog / Digital Signal**

- » Op amplifier » 74-series logic family
- » Comparator » Bus switch / level shift

◆ **I/O Interface**

- » RS-232/485 driver » Darlington array

◆ **Special Application**

- » Hall » Telecom » Timer
- » Audio/display » Automotive

Discrete parts

◆ **MOSFET**

- » **Super-junction**
- » Planar » Trench
- » Split-gate (SRFET)

◆ **Transistor**

- » Power Tr. / Darlington
- » Digital » RF » JFET

◆ **IGBT**

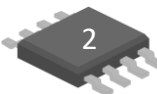
◆ **TRIAC**

◆ **Diode**

◆ **SCR**

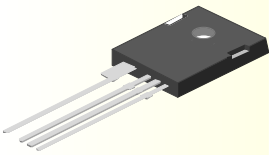
◆ **TVS**

◆ **Opto-dev.**

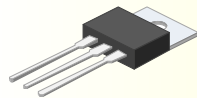


Major Package Lines

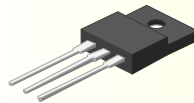
TO-247/TO-247-4
TO-3P/3PF/3PN



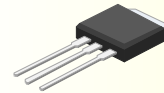
TO-220-2/3/4/5
TO-220B/Z7/Z9
(non-isolated)



TO-220F/F1/F2/F3
TO-220F-4/6
(isolated/molded)

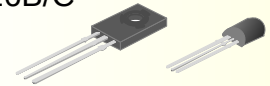


TO-262 (I²PAK)
TO-251 (IPAK)

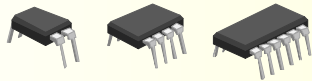


DO-201AD / DO-15 / DO-41

TO-126 TO-92 series
TO-126B/C

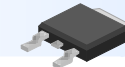


DIP-4/7/8/12/14
DIP-16/18/...40



HZIP-11/15/25
(H)SIP-3/4/...14

TO-263 (D²PAK) -3/5/7
TO-252 (DPAK) -3/4/5
LFAK*



SOT-223 -2/3/5
SOT-89 -3/5



TOLL

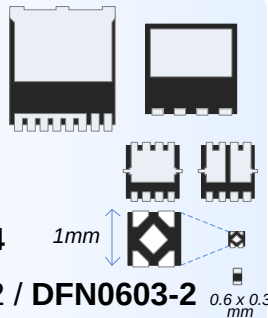
DFN8080

PDFN5x6

PDFN3x3

DFN1010-4

DFN1006-2 / DFN0603-2



DFN3030

DFN2020

...

DFN1010-6

QFN5060

QFN3030



HSOP-8 SOP-8

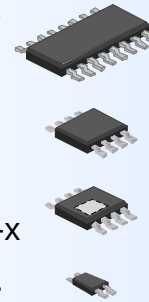
(H)SOP-14...28

(H)TSSOP-x

(H)MSOP-x

SSOP-x QSOP-x

SMD-4 LSOP-4



SMC / SMB / SMA



SOT-23

SOT-323

SOT-523

SOT-723

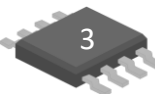


SOD-123(S/F)

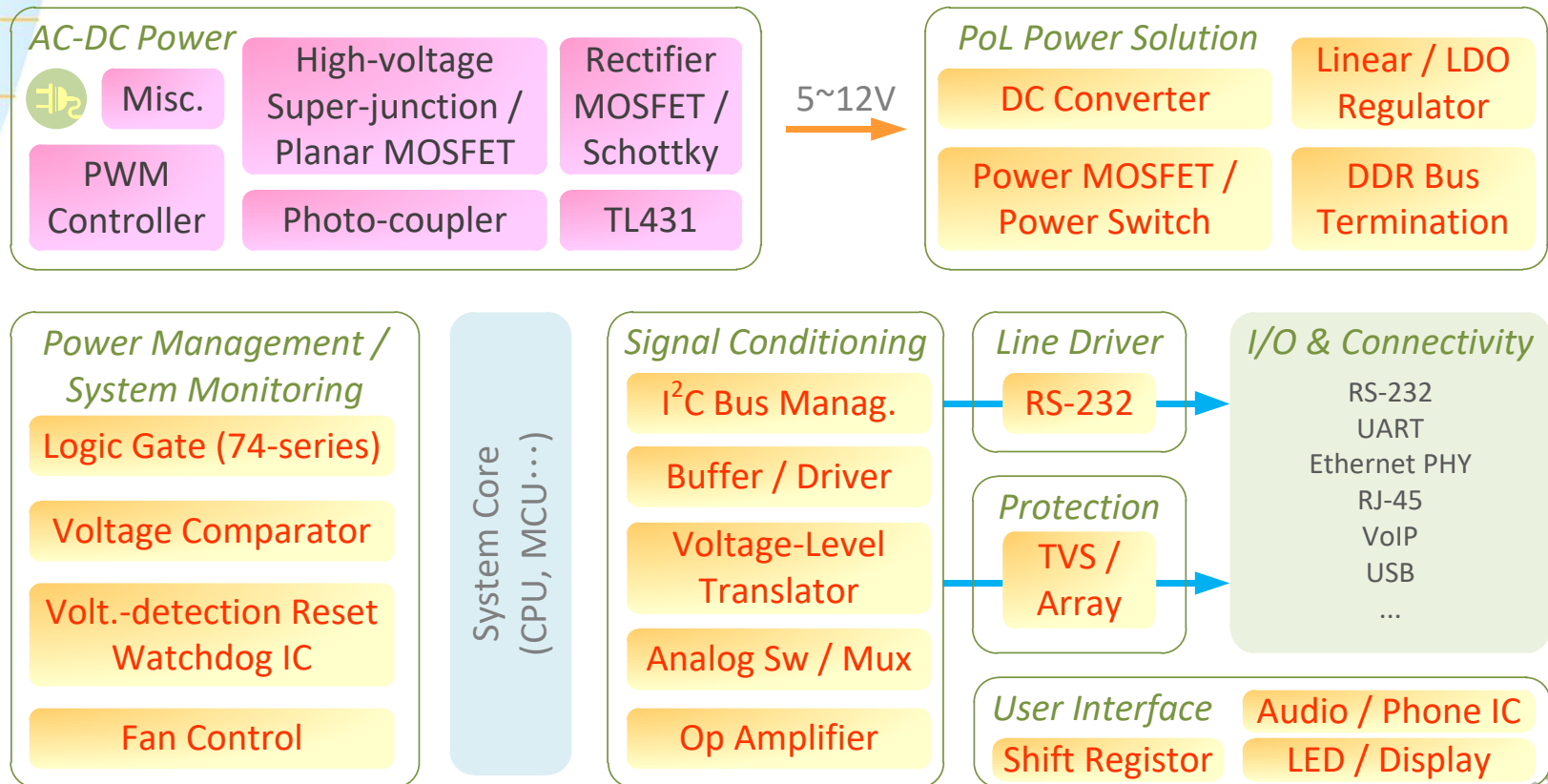
SOD-323(S/F)

SOD-523

SOD-723



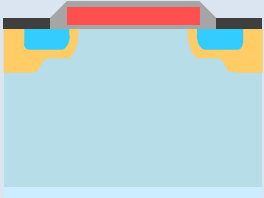
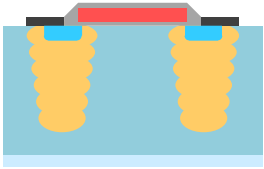
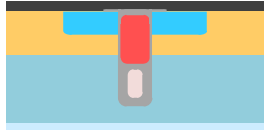
- ◆ Connectivity: router, network switch, modem, WiFi AP...
- ◆ End-point: IP-phone, conference-system...
- ◆ RF device: LNB, tuner...



- 
- A thick red horizontal arrow pointing to the right, spanning the width of the slide.
- ◆ AC-DC power supply
 - ◆ DC power & system management
 - ◆ Signal conditioning
 - ◆ I/O & interface

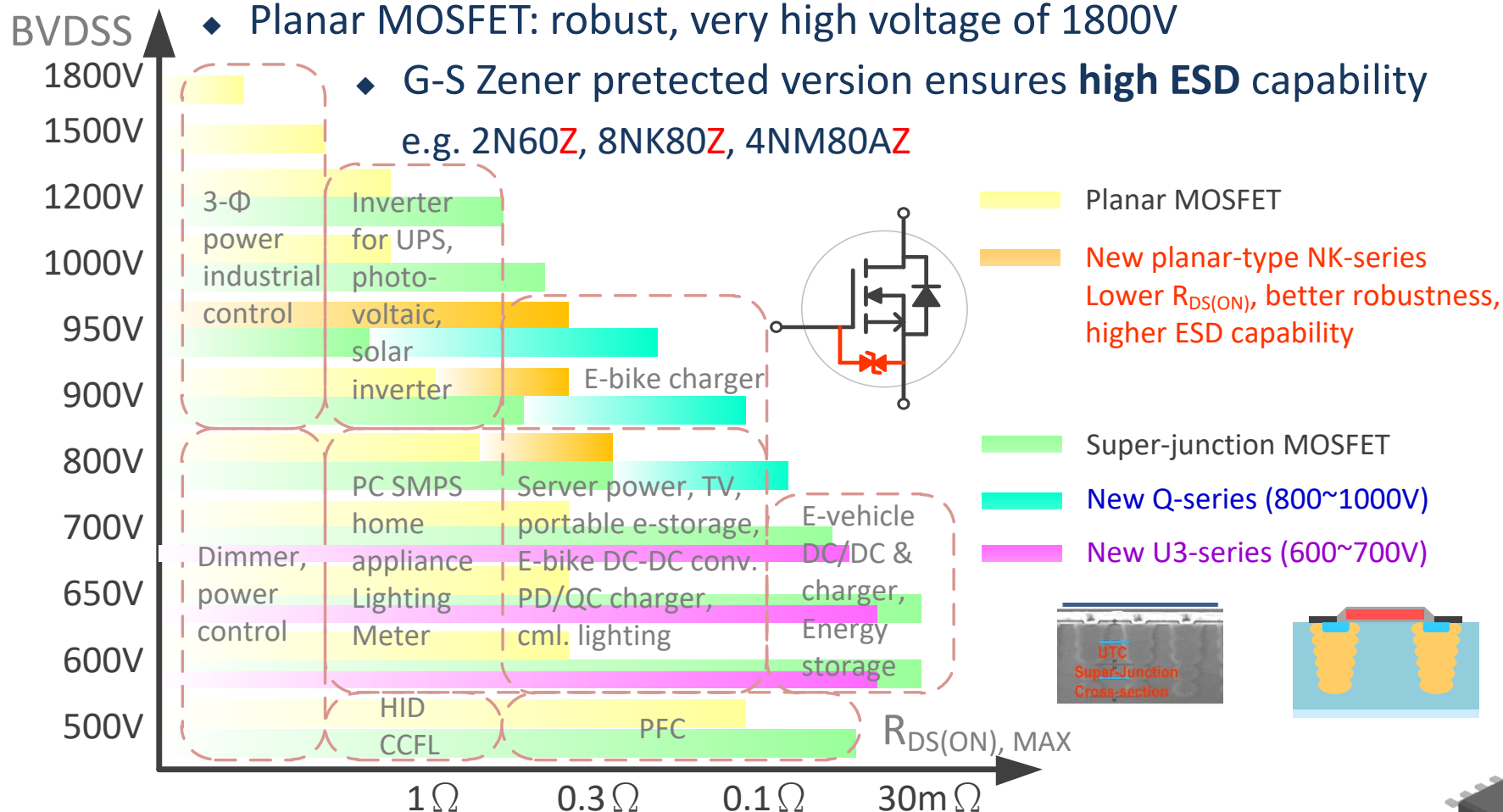
- ◆ AC-DC power supply
 - » Power MOSFET
 - » Diode
 - » Photo-coupler
 - » Driver IC and auxiliary part
- ◆ DC power & system management
- ◆ Signal conditioning
- ◆ I/O & interface

Structures of UTC MOSFET

	Structure	Name rule	N-ch	P-ch
	Planar MOSFET	yyNxx, yyNKxx, UFyyNxx, yyPxx FyyNxx (fast-recovery) UFzzz (special code)	55~ 1800V (-FC -FCQ prf.) (-ML -MH prf.)	≤500V
	Super-junction	yyNMxx FyyNMxx (fast-recovery)	500~1200V (-U3 -Q -G2 prf.)	N/A
	Trench MOSFET	UT(T)yyNxx, UT(T)yyPxx UTzzzz (special code)	≤250V	≤200V
	Split-gate trench	USG(R)yyNxx USGxxRrrr	30~200V	N/A
Special type	Signal Switching / Depletion-mode	e.g. 2N7002, BSS138 e.g. BSS169, UF601Q		

High Voltage MOSFET

- ◆ Super-junction MOSFET: **Low $R_{DS(ON)}$, fast switching**, ideal for PD charger, eV charger, and high-eff. Power/lighting
- ◆ Planar MOSFET: robust, very high voltage of 1800V
- ◆ G-S Zener prectected version ensures **high ESD** capability
e.g. 2N60Z, 8NK80Z, 4NM80AZ



Mid/low-voltage MOSFET

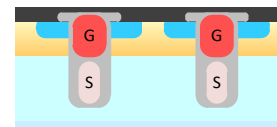
- ◆ Low-voltage trench MOSFET (12~250V): most popular devices across *consumer electronics, commercial / industrial (low-v) control boards*
- ◆ **Various tiny package lines** and multi-channel, high-density product
- ◆ 55V~400V Planar MOSFET: high EAS for motor driving, power tool
- ◆ **Split-gate trench** MOSFET (mostly 100V, expanding to 30~200V)
 - » PD/QC charger and power supply:
 - 2nd-side synchronous rectification
 - Thriving USB PD application
 - » Mainboard, power board of all application:
 - High-efficiency DC-DC conversion
 - » High-current (battery-powered) devices

- ✓ mΩ-level $R_{DS(ON)}$
- ✓ Fast switching
- ✓ Slim package from TOLL, DFN8080, 5x6, 3x3 to 1mm

Conventional Trench



Split-gate Trench



◆ Combo (multi-channel) MOSFET

Config.	Power MOSFET	Signal Switching
N-ch x2	UTT48NN06 UT30NN10H	UT02NN03Z 2N7002KDW
P-ch x2	UT20PP03	BSS84ZDW
N+P-ch	UT30NP06M	UT6M2
Multi	UD9930M	1NNPP10

Dual High-V MOSFET

D1NM70-Q

1NN70-ML

4NN65-MHQ

2NN65-LC1

F2NN50-LC1

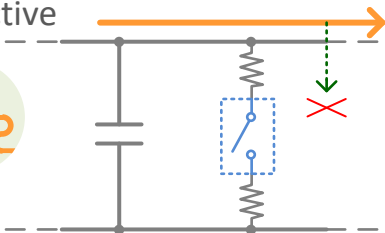
2NN50-SE1

SOP-8
PDFN5x6



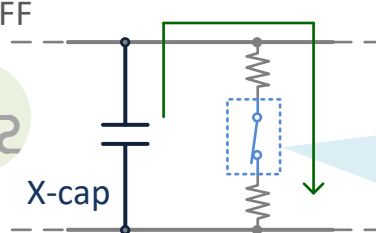
Reduction for standby power

Power active

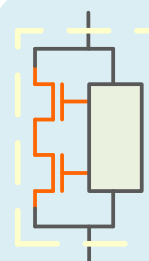


Consumption reduced

Power OFF



Discharge for safety

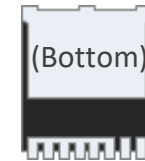


UASS101*
integrated for
X-cap discharge,
saving $P_{IN, STDBY}$

*in development

Package Extension Capability

- ◆ Package options of high power density & accuracy
- ◆ Slim dimension DFN8080 (thickness 1mm)
- ◆ Small package options for driving / signal switching
- ◆ Multi-channel integration capability



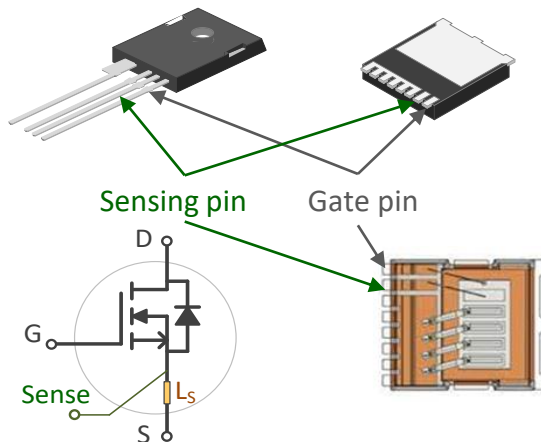
TOLL



DFN8080

Accurate Source Sensing

TO-247-4, TOLL-8B package
Accurate current sensing from L_source



Package Miniaturization



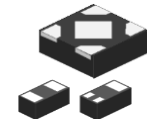
PDFN5x6
PDFN3x3



DFN2020
2.0mm



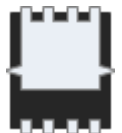
SOT-723
1.5mm



DFN1006
1.0mm

Multi-channel Packages

D1NM70	PDFN5x6
D1NM70-Q	PDFN5x6
1NN70-ML	PDFN5x6
F2NN50-LC1	SOP-8



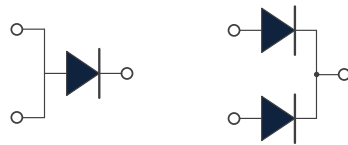
MOSFET Cross-reference

Product Category	UTC Example	Competitor	Competitor PN
Super-junction MOSFET (500~1200V)	xNM60 xNM65 xNM80 xNM90	Infineon ST Toshiba	STD7NM64N IPI90R500C3
Planar MOSFET (up to 1800V)	12P10 UF9640 4P50 UF3205 UF630 UF830 15N20 xN40 xN60 xN65 xN80 xN100	Vishay IR (Infineon) Fairchild (On-semi)	IRF9640 IRF3205 IRFP22N60K FQP10N80C
Low Voltage Trench MOSFET (10 ~ 250V)	UT4101 UT3419 UM6K1N UTT50N06	On-semi AoS Rohm Toshiba	NTR4101P AO3419
Signal Switching MOSFET	BSS84ZT BSS139Z 2N7002K BSS127	Nexperia Diodes Rohm	BSS84 2N7002K
Combo MOSFET (N-ch x 2, P-ch x2, N+P)	UD9926 QS8M11 UD4606 1NNPP10	Fairchild (On-semi) Rohm AoS Diodes	FDS9926A ZXMHC10A07N8

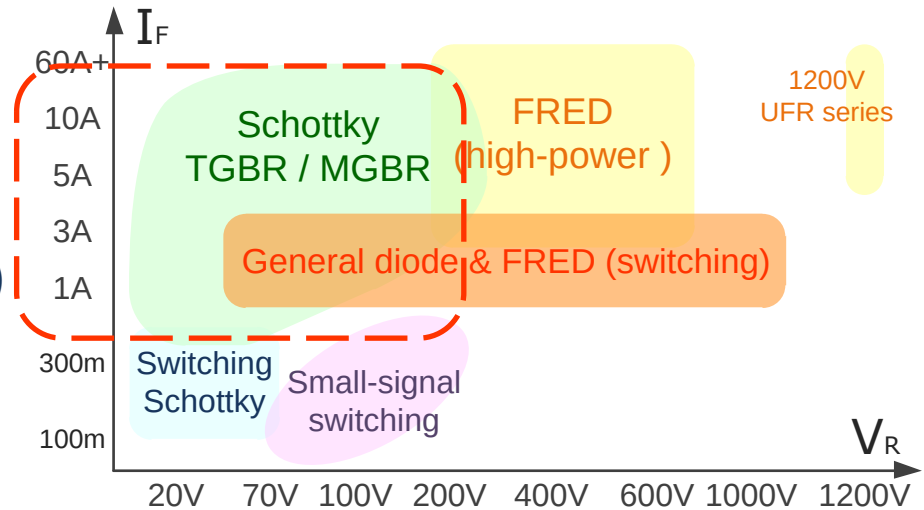
Schottky Power Rectifier

Low- V_F , widely seen in PSU, charger (40~200V, 5~20A) and mainboards (20~60V)

- ◆ MBR-series (150°C rated)
e.g. MBR10100 (100V 10A)
MBR10100C (100V 5Ax2)

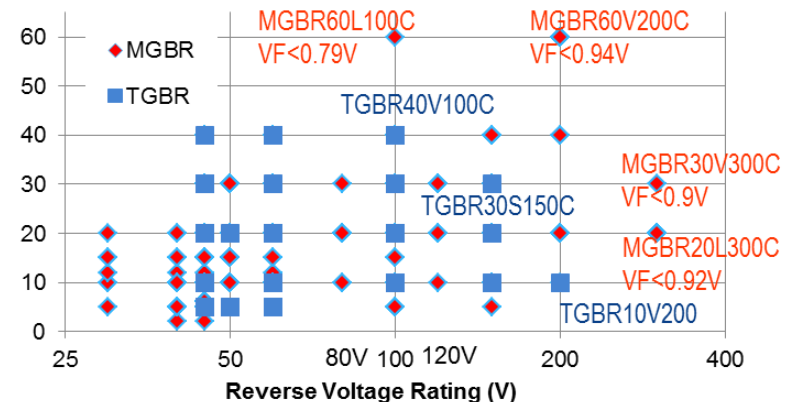


- ◆ SB/SK/SR-series (125°C rated)
e.g. SB10100 (100V 10A)
special: SK24, SR24 (40V 2A)
- ◆ MGBR/TGBR-series
pricier but better rated (than MBR)



Current Rating (A)

UTC Low- V_F Schottky Portfolio



Speed: N/A (general) < fast
< ultra/super/hyperfast

- ◆ UMUR-series ultrafast

e.g. UMUR1660C (dual)

UMUR1660 (600V 16A)

- ◆ UFR-/UHR-series

Ultra/super/hyper-fast

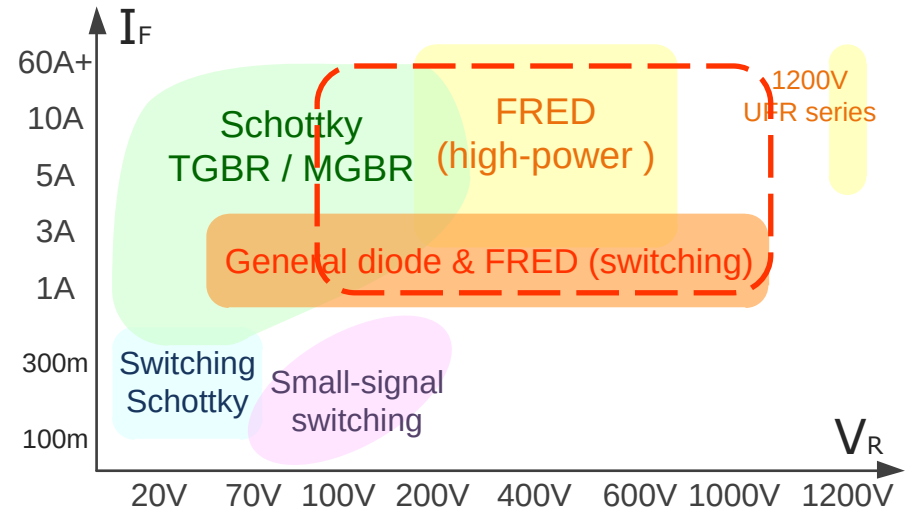
featuring soft-recovery e.g. UFR75120 (1200V 75A), UHRP1560

- ◆ BYC/BYR-series: ultra/hyper-fast, e.g. BYC20, BYR29...

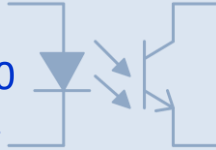
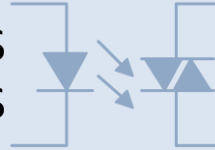
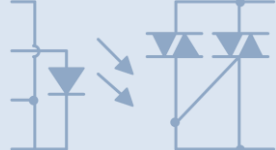
- ◆ Other special but **popular** series (1~5A, see next page)

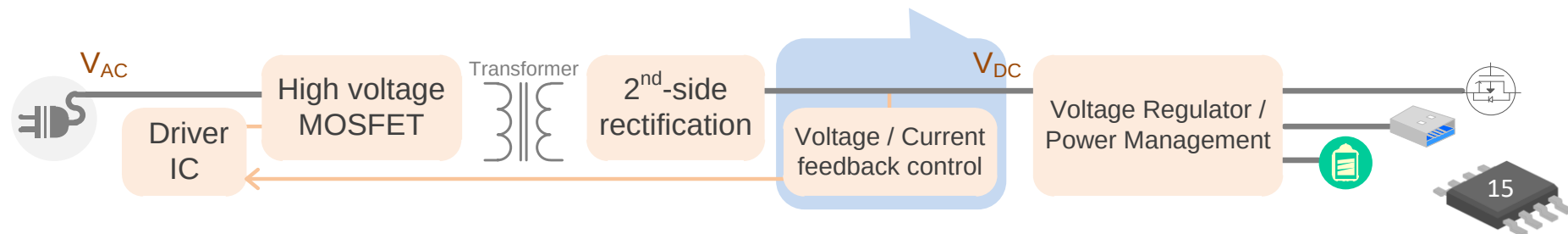
- ◆ Glass-passivation product: better reliability

- ◆ Application: lighting, power, industrial application



- ◆ Popular UPC816 / UPC817 / UPC10XX
 - » DIP-4 / SMD-4 / LSOP-4 packages
- ◆ TRIAC-output UOC-series
- ◆ High-current non-zero crossing type

Transistor Output	TRIAC output	NZC Solid State Relay
UPC816 CTR: 50~600 UPC817 B:130~260 C:200~400 UPC10xx DIP-4/SMD-4/LSOP-4 	UOC3020S UOC3021S 	UPT0133 UPT2223 UPT3223 



- ◆ UTC designs and manufactures controller IC for power application
 - » **Quasi-resonant valley switching** UC3816 / UC3826 / UC3916...
 - » **Green-mode** UC3873 / UC3863: freq. / OTP programmable
 - » Current-mode UC3842/43/44/45x, UCx842A/B, UCx843A/B...
 - » Conventional (voltage mode) controller: TL494, MC34063...
 - » UCL- series: lighting application

PCBA-level verification & tech support of UTC total solution



*PSR, MOSFET integrated
Compact charger solution
Support cable-drop comp.*

*SSR, MOSFET integrated
Low stand-by consumption
Const. OLP for universal AC-in*

HV-start

UCSR3652S

650V 2.4 Ω

HV-start

UCSR3654S

650V 1.6 Ω

HV-start

UCS1655S

650V <1.3 Ω

UC38xx
Fly-back controller series

Mobile phone Charger

Adaptor / Stdby Power

Tablet Charger / STB Adaptor

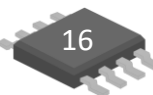
12W

18W

36W

60W

(DoE Lv.6 compliant)



- ◆ AC-DC power supply
- ◆ DC power & system management
 - » Linear & LDO regulator
 - » DC converter
 - » Voltage detection reset & watchdog IC
 - » Voltage reference (431) & DDR bus termination
- ◆ Signal conditioning
- ◆ I/O & interface

Linear Regulator

➤ **Tiny package / compact design**

➤ **Low I_Q consumption / low ground current**

➤ **Low V_{IN} & low V_{OUT}**

Standard CMOS LDO
5V mainboard application

V_{OUT} : 1V~5V, I_{OUT} : max 3A
 $V_{D,max}$: 0.15V~0.65V (3A)
 I_Q : tens of μA
DFN packages

Low- I_Q CMOS LDO
Battery-powered device

V_{IN} : max 36V
 I_{OUT} : max 0.5A
 $V_{D,max}$: 0.15V~0.65V
 I_Q : 1- μA level or less

Ultralow- V_D CMOS LDO
Low-voltage operation

I_{OUT} : 1~7A, V_{IN} : min 1V,
 V_{ADJ} : 0.8V, V_D : 0.1~0.3V
High-integration of EN, POK,
Soft-start, Discharge, Flexible

➤ **Conventional P2P alternatives**

78- 79- 317- series

Linear Regulator
50mA~1.5A, 35/40V rated

Conventional LDO

e.g. LD1117A, UR133,
UZ1084, U584

Relatively low V_D

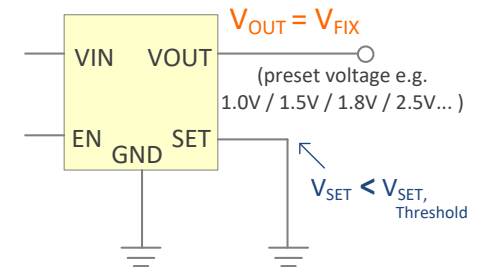
Regulator e.g. 78Rxx,
LP2950, LR1118, LM2940

◆ CMOS LDO of versatile features

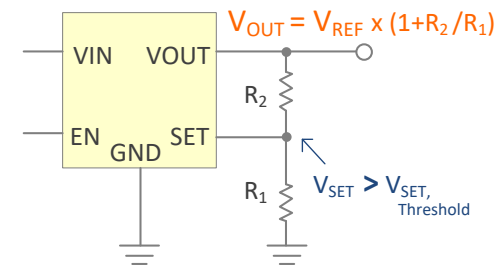
Type	Part Number
LDO with Power-on Reset (POK)	LR3865 (2A) LR1965/2965/3965 (1.5A) LR1108E (1A) LR1107E (0.6A), All ultralow- V_D CMOS LDO (L11831 LR18120 LADLD10~70)
Output (adjustable / fixed) selectable	L11831 (3A) LR18120, LR3865 (2A) LR3965 (1.5A) LR1108 (1A) LR2125, LR2128 (0.3A)
High PSRR CMOS LDO	LR9102 LR9500 UR6223 (PSRR 75dB~85dB)
High-accuracy CMOS LDO	LR1801 LR9101 LR9102 LR9103 LR9113 UR6223 LR1122D (1%) LR18120 LADLD series ultralow- V_D (1.5%)
Capacitor-less LDO	LR9107 LR9203
Inrush protection	LR1802 UR6223

Output FIX/ADJ mode
selectable LDO:
providing flexibility
for circuit design

LDO works in **FIX** mode

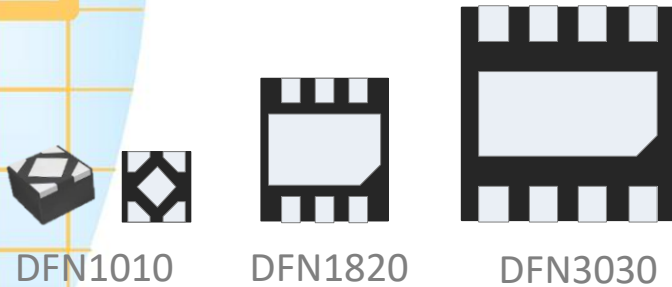


LDO works in **ADJ** mode

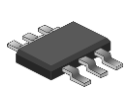


Tiny-Package CMOS LDO

Tiny DFN packages

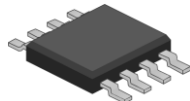


Various Package Options



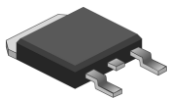
SOT series

SOT-25 / SOT-353
SOT89 / SOT-223



SOP series

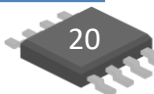
SOP / HSOP
TSSOP / MSOP



TO series

DPAK / D²PAK
IPAK / I²PAK

I _{OUT}	P/N	DFN Pckg	Feature
150 mA	LR9103	DFN1010-4	Low-I _Q (<1.5μA)
	LR9280	DFN2020-6	
300 mA	LR9102	DFN1616-6 / DFN1820-6	V _{OUT} option 1~5V High PSRR
	LR9113	DFN1010-4	Inrush protection
	UR6223	DFN1010-4	
400 mA	LR9282	DFN1010-4	Low-I _Q (<1.5μA)
	LR1106	DFN1820-6	V _{IN} 8V operation
500 mA	LR9153	DFN1010-4	
1.0 A	LR1805	DFN2020-6	inrush protection Flexible V _{OUT} or POK
	LR1108	DFN3030-8	
3.0 A	L1806	DFN3030-10	Ultra-low V _D
2-ch 300mA	LR6401	DFN1820-6	Dual Channel



Regulator Cross-Reference

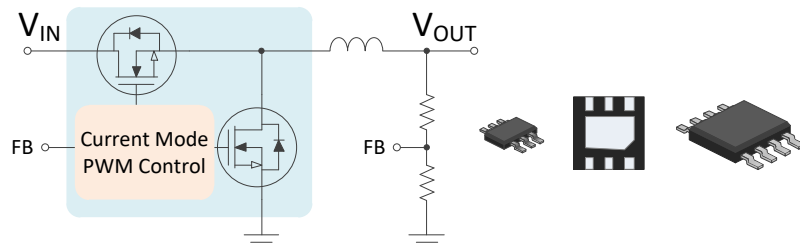
➤ Linear Voltage Regulator

Product Category	UTC Example	Competitor	Competitor PN
Linear Regulator -- Positive / Adjustable/ Negative DFN / SOT-89 / SOT-223 / SOP-8 / TO-252 (DPAK) / TO-263 (D2PAK) / TO-251 (IPAK) / TO-262 (I2PAK) / TO-92 / TO-126 / TO-220 / TO-220F	78Lxx LM78xx 78Dxx LM78xxA LM317 LM317A 79Lxx LM79xxA	TI (Texas Instrument) ST Fairchild (On-semi)	78L05 LM7805 78D12 LM7824 LM317 LM317A 79L05 LM7912
LDO (Low-dropout) Regulator	LD1117A LP2950 78R05 UZ1084	ST On-semi Rohm	LD1117 LP2950 78R05 UZ1084
CMOS LDO Regulator 5.5~10V input, consump. 20~200μA Enable function, small package	LR1801 (1A SOT-89) LR9103 (DFN1010)	TI Rohm On-semi	TLV733xx BuxxTD NCP702xx
<i>Special CMOS LDO:</i> Ultralow-dropout ($V_D < 0.35V$) Low-quiescent (μA-level) Dual-channel LDO	LR18120 LxxLD30 LR9280 UR75xx LR6401 LR3xxyyB	Rohm R**** T**** A**** H***** G**	R1180x HT75xx AP6401 R5323

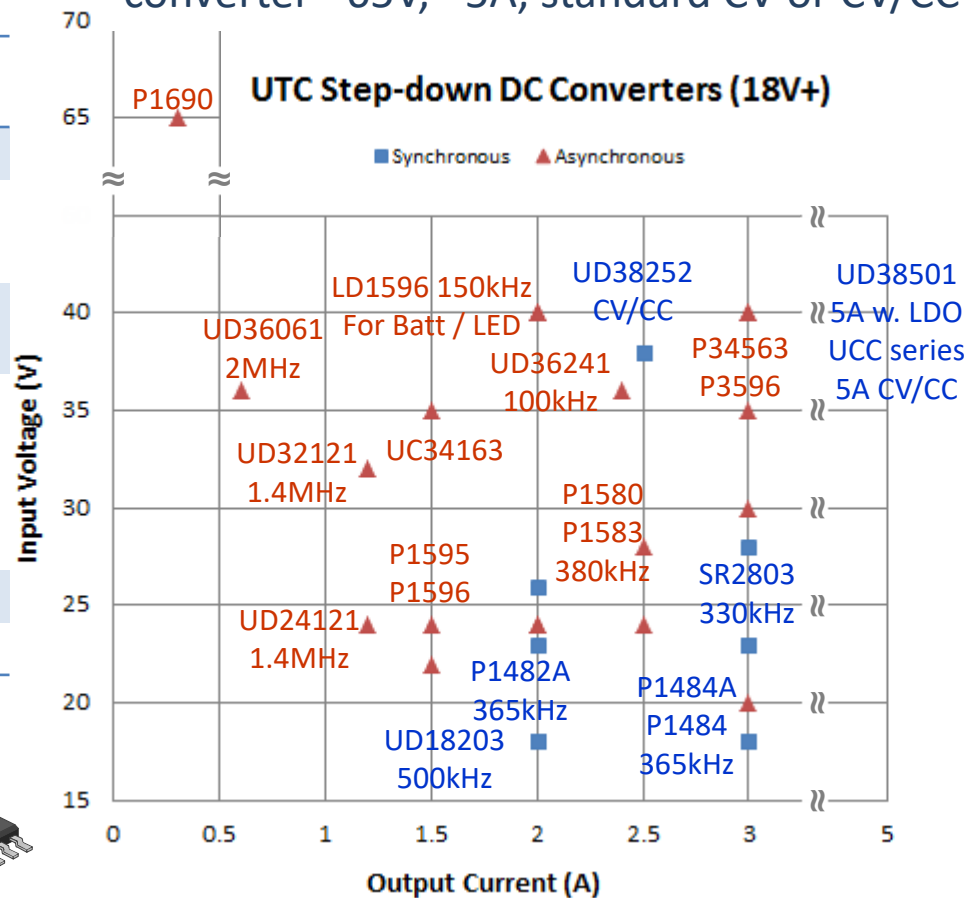
DC Step-down Buck Converter

- High-efficiency 5V synchronous buck converter ($V_{FB}=0.6V$) with EN, soft-start, MOS-integrated, small package

5V Sync. Buck	I _{out} (A)	Freq (MHz)	Remark
UC3206	0.6	1.45 / 2.8	1.5μH
UC3656~ UC3666	0.5~ 1.0	1.3~1.6	1-ch / 2-ch DFN package
UD0510x	1.0	1~2.25	Power-saving Hiccup mode
UD0512x	1.2	1.4~2.25	SOT-25 /
UD0515x	1.5	1.5	DFN3030 / 2020
UD0520x	2.0	1~1.5	1-ch / 2-ch SOT-25 HSOP-8
UD0525x	2.5	1.2	DFN3030 / HSOP
UD0530x	3.0	1.0	1-ch / 2-ch w. PoR

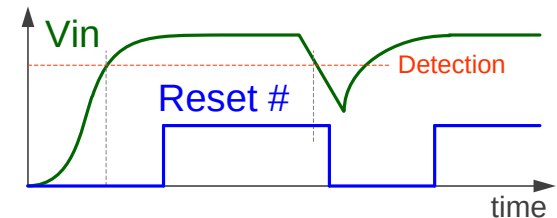


- High-voltage Buck Converter
Broad coverage of step-down buck converter ~65V, ~5A, standard CV or CV/CC



➤ Voltage Detection Reset IC

- Detecting 0.9~6.2V voltage fault protection
- Power-on reset for power sequence control
- Active-low, open-drain / push-pull output
- Fixed/adjustable delay time
- Watchdog function
- Telecom devices, high-reliability equipment



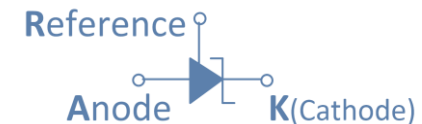
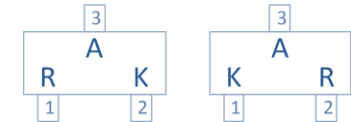
PN	Delay	Misc
81xx / 82Nxx / 82Cxx	-	
81Nxx / 81Cxx	1~400ms	
88Nxx / 88Cxx 89Nxx / 89Cxx	T_{REC} adjustable	
82xx / 83Cxx UIC811 / UIC812	30ms~1.2s	Manual Reset
UIC813	140~560ms	Active-high
UWD706 UWD817*	120~280ms	Watchdog

◆ Voltage Reference IC

TL431: high precision **0.5%**

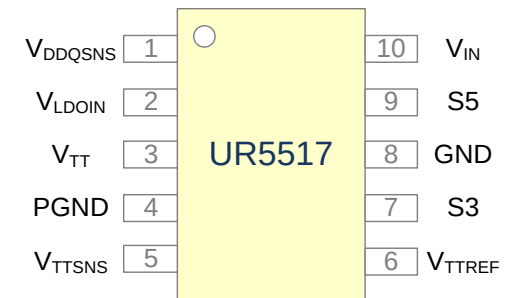
LL431, ULVH431: **low** $I_{K(MIN)}$ ($< 100\mu A$)

P2P packages and pin-out



◆ Bus termination voltage regulator

DDR RAM circuit in computer, telecom, consumer electronics



Support DDR

DDR1(2.5V) / DDR2(1.8V) / DDR3(1.5V)

DDR3L (1.35V) / LPDDR3, DDR4 (1.2V)

Part Number

UR5596 UR6512, UR5517

UR6517 (1.8A)

- ◆ AC-DC power supply
- ◆ DC power & system management
- ◆ Signal conditioning
 - » Op amplifier & comparator
 - » Logic family
 - » Bus switch & analog multiplexer
 - » Voltage-level translator
- ◆ I/O & interface

◆ Pin-to-pin operational amplifier & voltage comparator

	Op amplifier	Comparator	Package
1-ch	LM321 LV321 TL071	TS391 LMV331	SOT-25 SOT-26 SOT-353
2-ch	LM358 LV358 LM2904	LM393 LMV393	MSOP/TSSOP/SOP/DIP -8/-10
	MC4580 MC34072 TL072	LM293 LM2903	DFN2020~DFN2030 -8/-10
4-ch	LM324 MC34074 TL074	LM339 LM2901	QFN/TSSOP/SOP/DIP-14/-16

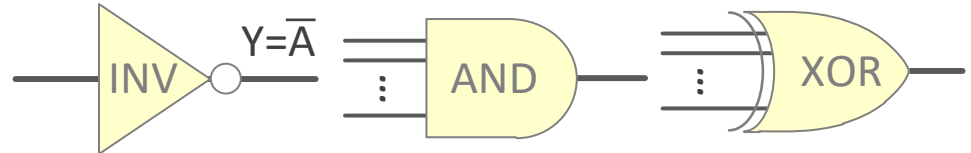
◆ UTC advanced amplifier & comparator selection

- » Rail-to-rail input & output amplifier: LV2461 / LV2462 / LV2464
- » RRIO zero-drift amplifier: ULV8552 ($V_{\text{OFFSET}} 1\mu\text{V}$)
- » RRIO low-volt. micro-power: ULV6042* ($V_{\text{CC,MIN}} 1.4\text{V}$, $I_{\text{CC}} 0.9\mu\text{A}$)
- » High-frequency amplifier: ULV662 (50MHz, RRO)
- » Low-consumption push-pull output comparator

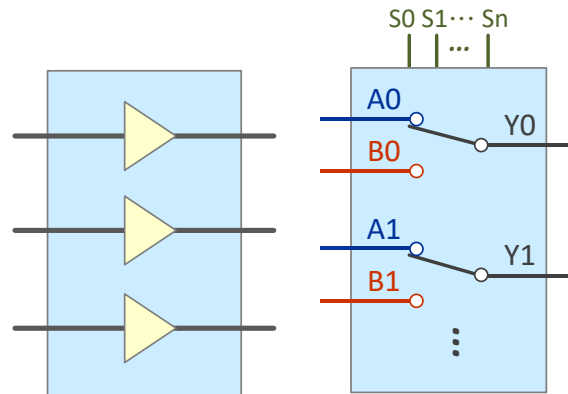
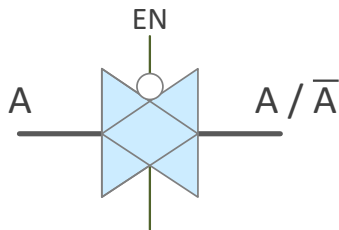
*: Development stage

◆ Functions

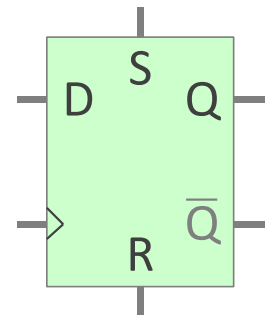
Logic Gate: inverter, buffer, AND/OR/XOR/NAND/NOR gate, Multifunction gate



Bus Tranceiver
Switch / Multiplexer



Shift Register
Flip-flop
Latch



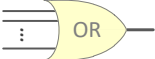
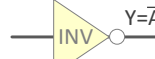
Timer, vibrator, oscillator, encoder, counter...

◆ Circuit Technology

Low-voltage: AUP/AUC/LVC/AHC...

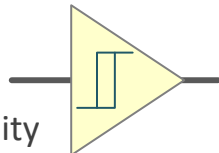
15-V application: CD4000 logic

TTL compatible: AHCT/HCT...

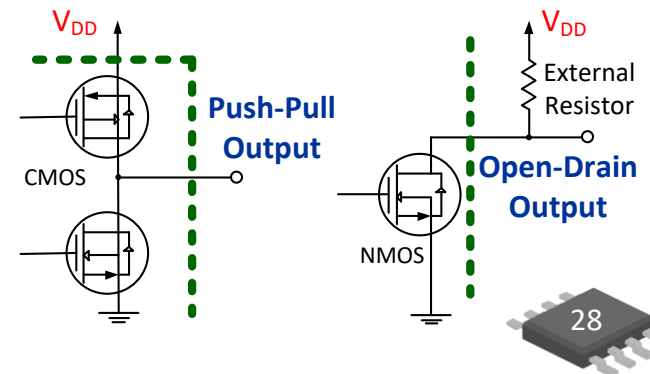
Function	Symbol	Logic gate (example)			High-V logic
AND		U74AUC1G08	U74AHC1G09	U74AHC21	UCD4081B
OR		U74AHCT32	U74AUP1G32	U74LVC2G32	UCD4071B
XOR		U74LVC86A	U74AHCT86	U74AUC1G86	UCD4070B
NAND		U74AUP1G00	U74LVC1G10	U74LVC2G132	UCD4011B
NOR		U74LVC02A	U74AUC1G02	U74AUP1G02	UCD4001B
Inverter		U74AUP1G04	U74AUP1G06	U74LVC2G240	UCD40106B
Buffer		U74LVC1G125	U74AUC1G126	U74LVC2G241	UCD4050B
Multi-function gate		U74LVC1G57 / U74LVC1G58 / U74LVC1G97 / U74LVC1G99			

- Gate numbers (1G/2G/3G...)
- Input numbers
- Normal / Schmitt trigger input

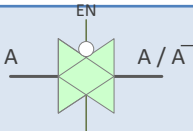
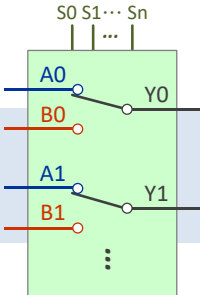
Schmitt trigger:
better noise immunity



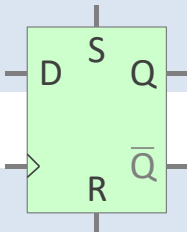
- Output type:
Push-pull /
Open-drain /
Tri-state



- Bus switch / Mux

Function	Symbol	Example		High-V logic
Bus Switch		U74LVC2G66 U74CBTLV3125	U74CBT1G384 U74CBT3306	UCD4066
Line Decoder / Mux / Demux		U74LVC1G19 U74AUP1T157	U74HCT138 U74LVC258	
Analog Multiplexer		U7SB3157 74LVX4051	US5C3257 U74LVX4053	4051 4052
(Non-74 series)		UMX4215	UMX2215	

- Data register

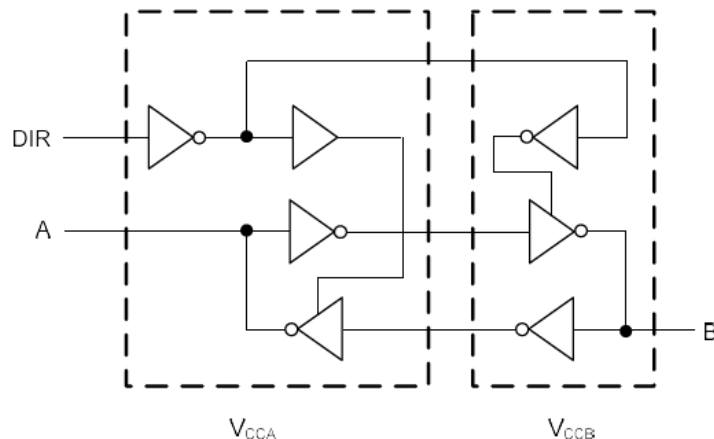
Function	Symbol	Example		High-V logic
Flip-flop		U74AUP1G74 U74LVC574	U74AHC374 U74HCT73 (J-K)	UTC4013
Latch		U74LVC373	U74LVC573	
Register		U74AHC164	U74AHC595	UCD4015B

Voltage-level Translation

- Dual-isolated-supply voltage translation part with direction control
- Configurable input/output

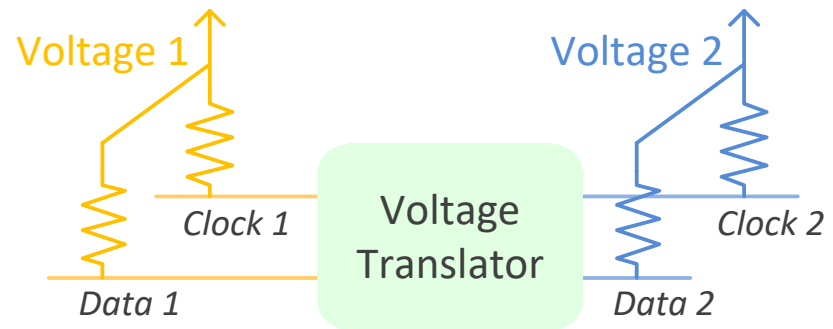
Bi-direction transceiver

U74LVC1T45 U74LVC2T45
 U74AVC2T45 U74AVCH2T45
 U74AVC2T245 U74AVC4T245
 (-245 type: 2 DIR pins)



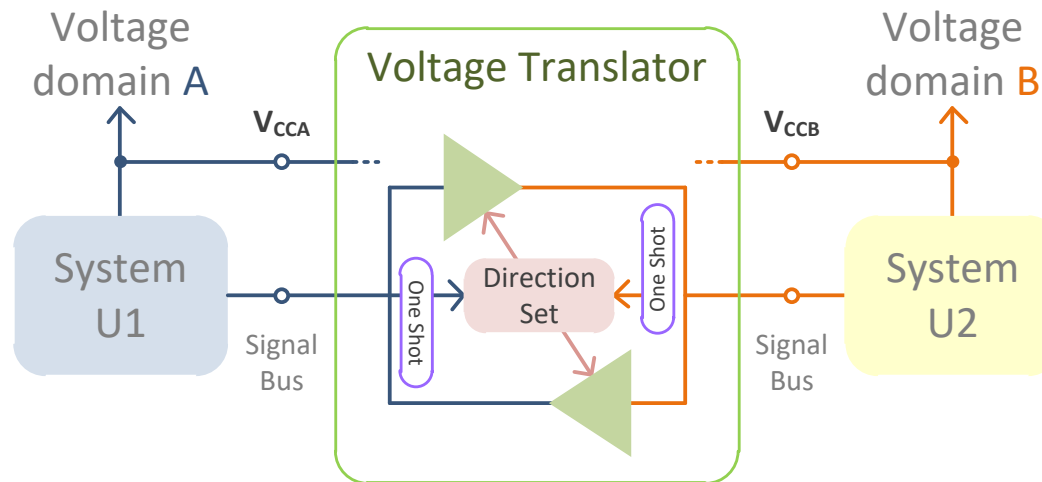
- I²C bus bi-directional voltage-level-translating buffer / switch
- Open-drain bus

Part Number	Package
UCA9306	MSOP-8 / SOP-8
UCA9617	MSOP-8 / SOP-8
UCA9543*	SOP-14



Signal Bus Voltage Translation

- Bridging signal bus across different voltage domain
- Separate-supply voltage translation w. partial-power-down protection
- Auto-sensing direction of transfer from one-shot circuit



*Bus voltage is pulled to same logic-state of respective voltage rail.

*The bus logic-state is determined by one-shot circuits that auto-sense signal transition from either side.

NEW UTC bi-directional auto-sensing voltage level shifting / translator

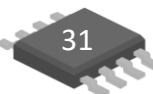
Push-pull output for up to 100Mbps bus

UTXB0101	1-bit
UTXB0102	2-bit
UNTB0102*	2-bit
UTXB0104	4-bit
UTXB0106*	6-bit

Internal pull-up output for open-drain/push-pull bus

UTXS0101*	1-bit
UVXS0102*	2-bit
UTXS0104	4-bit
UNTS0104	4-bit
UTXS0108*	8-bit

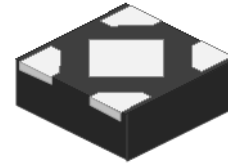
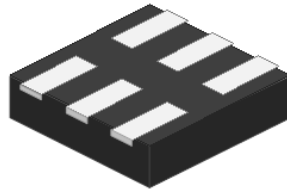
*under development



New Package Extension

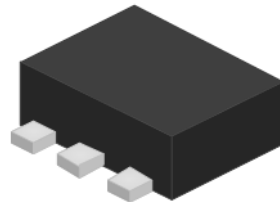
- ◆ Tiny **X2DFN1010-6 / X2DFN0808** package

U74AUP1G02 U74AUP1G06 U74AUP1G07 U74AUP1G08
U74AUP1G32 U74LVC1G07



- ◆ **SOT-553** package

U74LVC1G07 U74LVC1G14 U74LVC1G86 U74LVC1G126



➤ *Popular Integrated Circuit*

Product Category	UTC Example	Competitor	Competitor PN
Shunt Voltage Reference	TL431 ULVH431	TI Diodes	TLVH431
Voltage Detection Reset	89N09 UIC809 81Nxx 88Cxx	Rohm Mxxxx Txxxx Sxxxx	BU4209 MAX809 XC61CN S-809
Voltage Comparator	LM393 LM339 ULC393	TI ST	LM393 LM339
Operational Amplifier	LM358 MC4580 LM324	TI ST JRC	LM358 MC4580 LM324
Audio Amplifier	TDA2030A MC34119	ST Nexperia	TDA2030A MC34119
74-series 40-series Logic Gate / Register / Bus Switch / Multiplexer	U74AHCTxxx U74LVCxxx U74AUPxxx UCD40xx	TI Nexperia On-semi	SN74AHCT86 74LVC373 74AUP1G04 CD4052
RS-485 / RS-232	UTRS485 UT232A	TI Maxim	MAX485 SP232A
Darlington Driver	ULN2003 ULN2803	Rohm	ULN2003 ULN2803

- ◆ AC-DC power supply
- ◆ DC power & system management
- ◆ Signal conditioning
- ◆ I/O & interface
 - » RS-232/485 line driver
 - » Driver IC & driver array
 - » Analog phone speaker IC
 - » TVS diodes array
 - » Signal switching discrete part
 - » LNB controller & RF discrete

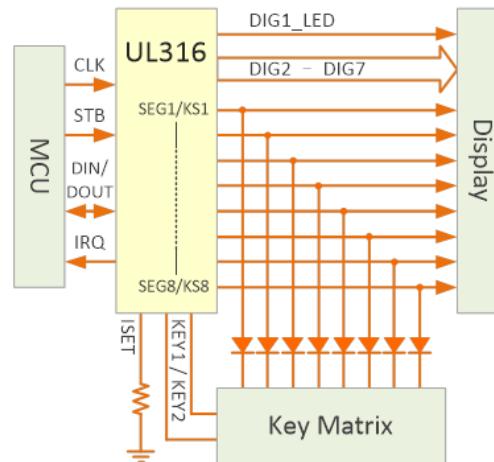
➤ Serial Interface Line Driver

Protocol	Part Number	Application
RS-485 / RS-422	UTRS485 UTRS458 UTRS3082	1-driver 1-receiver
	UTRS3085 UTRS3088 UTRS3080	
RS-232	75323	5-driver 3-receiver
	75185 75232 UT3243	3-driver 5-receiver
	UT3223 UT3222 UT3232 UT232A UT232E	2-driver 2-receiver
	UT3221	1-driver 1-receiver

➤ Darlington Driver Array

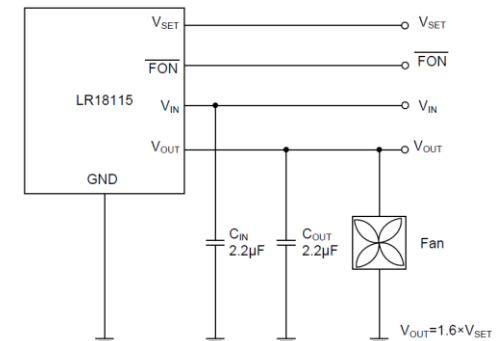
Part No.	NO. of Driver	Max. Voltage / Max. Current
ULN2003	7	50V / 0.5A
ULN2004	7	50V / 0.5A
ULN2803	8	50V / 0.5A
ULN2804	8	50V / 0.5A
62783	8	50V / 0.5A
62784	8	50V / 0.5A

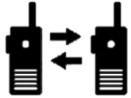
➤ Display Driver



➤ Fan Driver

LR18113 (EN) / LR18115 (EN#)
analog fan power control





Telecommunication Circuit

Ringer

LS1240A	Electronic Tone Ringer with Built-in Bridge Rectifier
31002A	Telephone Tone Ringer
TA31001	Telephone Tone Ringer
TA31002	Telephone Tone Ringer

Telephone Speech IC

TEA1098/A	Speech and Handsfree IC
TEA1062N/AN	Low Voltage Transmission Circuit with Dialler Interface
TEA1110A	Low Voltage Versatile Telephone Transmission Circuit with Dialler Interface
L6726	Universal Speech Circuit

Telecommunication Circuit

Voice Switched Speaker-phone IC

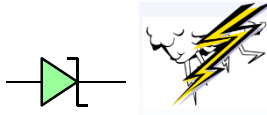
L38812	Voice Switch Circuit for Handsfree Speakerphone TAM
MC34118	Voice Switched Speaker-Phone Circuit
MC33218	Voice Switched Speaker-Phone with Microprocessor Interface
MC34018	Voice Switched Speaker-Phone Circuit

Cordless Phone

UA31136	FM IF Detector IC for Cordless Telephone
MC3361BP	Low Voltage/Power Narrow Band FM IF
3362	Low Power FSK IF IC
8507	Compander

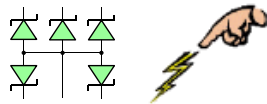
UTC TVS Diode & Array

➤ Surge Protection Diode



TVS Series	Power Rating (10/1000μs)	Package
P6KExxx	600W	DO-15
SMDJxxx	3000W	SMC
SMCJxxx	1500W	SMC
SMBJxxx	600W	SMB
SMAJxxx	400W	SMA

➤ ESD Protection Array



Part Number	power rating (8/20μs)	Package
SMA5V	50W	SOD-523
SOT05C	140W	SOT-23
UESDA6V1W5	150W	SOT-353
USMS05	350W	SOT-26
UZ5C056	150W	SOT-26

➤ High-speed-signal ESD



Application	Part Number
USB 2.0 Charger, USB OTG	USB4S012
Firewire , DVI and Ethernet	SRV05-4
DVI, Ethernet and USB2.0	UPRTR5V0U4D
DVI, Ethernet and USB2.0	PUSB220
HDMI LVDS SATA Ethernet	TVS4S009

➤ ESD-proof I/O Circuit

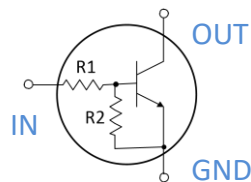


Application	Part Number	Protection
1284 Port	URCZ1284-xx	8 ESD+EMI array
VGA port	CCVGA7C5	RGB matching
	CCVGA7C9	RGB matching + DDC level-shift
	VGA7S019	RGB matching + DDC level-shift

◆ Small-package MOSFET

- » Signal switching 2N7002, BSS138/139Z, BSS84Z
- » Multi-channel 2N7002KDW, BSS138KDW
- » Low-voltage power MOSFET: UT34xx, UT23xx series

◆ Digital transistor (resistor biased)

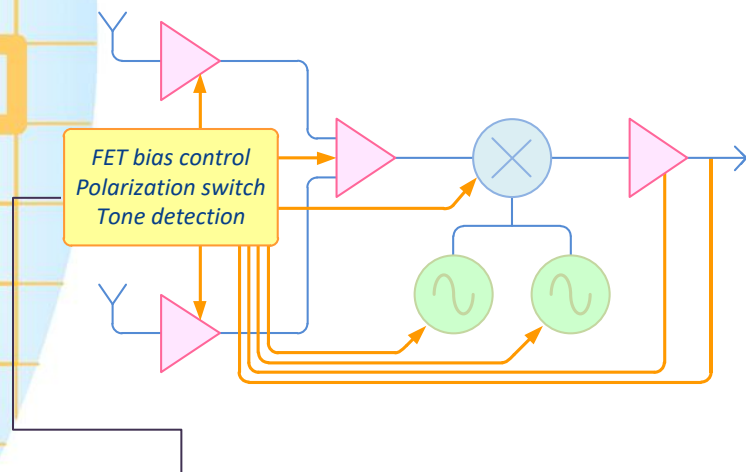


PNP type	DTA114E	DTA144E	DTA114W	DTB123Y
NPN type	DTC123J	DTC124E	DTC143X	DTD113Z

◆ Switching diode / Schottky

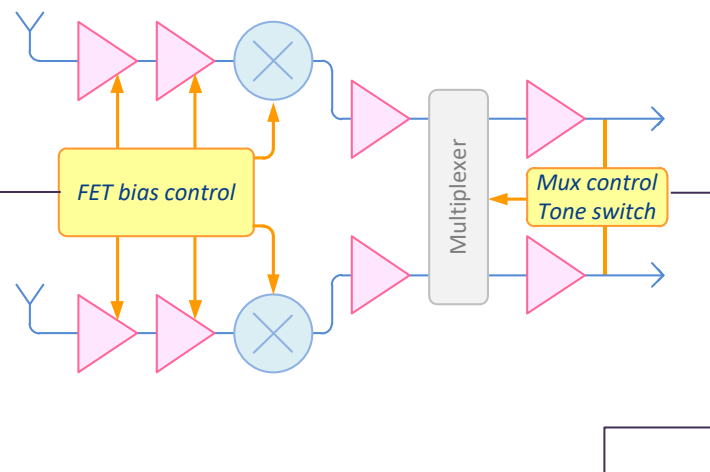
- » 1N4148 series, BAV / BAW series
- » Schottky BAS / BAT series: BAT54/BAT54C/BAT54A/BAT54S





*FET bias control
Polarization switch
Tone detection*

L8221	HSOP-8
L8200	TSSOP-16 QFN-16
L8115	SSOP-16 SSOP-20
L8211	SSOP-20
L8113	SSOP-20



FET bias controller

L8400	SSOP-16	4-ch
L8401	SSOP-16	4-ch
L8402	QFN-16 SSOP-16	4-ch
L8600	SSOP-20	6-ch
L8001	SSOP-20	6-ch
L8602	QFN-20	6-ch
L8002	SSOP-20	6-ch

*Multiplexer control &
tone detection switch*

L8010	SOP-8 MSOP-8
L8020	SOP-8 MSOP-8
L8012	SSOP-16
L8312	SSOP-16

Miscellaneous

LB8102	DiSEqC switch
L88312	LNB SCP

- ◆ RF bipolar NPN / PNP transistor
 - » f_T : 0.8~25GHz
 - » TO-92, SOT-223, SOT-89, SOT-23 / 323 / 523 / 723, SOT-363 options

- ◆ PIN diode
 - » BAP50-3 SOD-323
 - » 50V rated, $V_F < 1.1V$, $C_D \sim 0.33pF$ (@5V)
 - » RF multiplexer application

➤ Discrete Components

Product Category	UTC Example	Competitor	Competitor PN
High Power BJT / Darlington	2SC5200 2SA1943 (230V 15A) 2SC4467 2SA1694 (120V 8A) UN2488 UP1620 (10A hFE 5k~30k)	ST Toshiba Sxxxxxx	2SC5200 2SC4467 MN2488
Digital Transistor	DTA114E DTB123Y DTC143X DTD113Z	Rohm NXP.	DTA114E
FRED Rectifier up to 1200V ultrafast / superfast	UFR75120 (1200V 75A super-fast) BYC20 ES1J FR107G UFR8060C	Fairchild Nexperia Diodes	RHRG75120 BYC20 ES1J
Schottky Diode / Low- V_F Rectifier	SR26 RB751V40 MBR20150C TGBR40U100C MGBR40V300C	Vishay Diodes	TMBS series SBR series
Surge Protection	P6KE SMDJxxxx SMAJxxxx	ST Littlefuse	P6KE SMDJ
ESD Protection (for I/O port)	TVS4S009 PUSB220 SRV05-4 UZ18C6V8 SOT05C USMS05	TI Nexperia On-semi	TPD4S009 BZA100
SCR (200~1000V)	BT151 US650 MCR100	Nexperia ST	BT151 TYN840
TRIAC (400~1000V)	4Q: BTA12 UT136 3Q: BTA312A	Nexperia ST	BTA12 UT136

Thank You



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