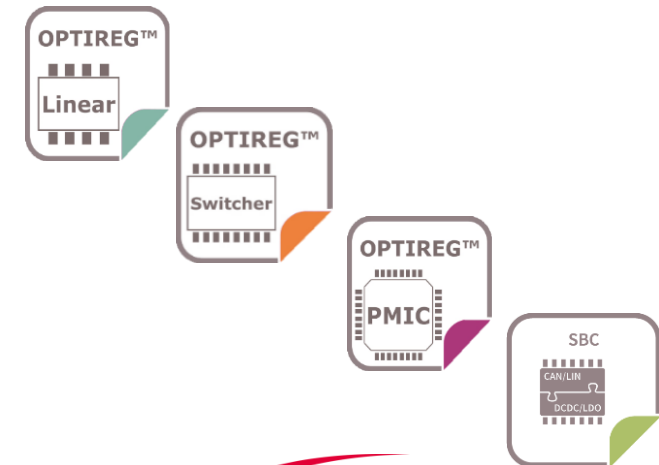# Powering Microcontrollers with OPTIREG™ and SBC Products
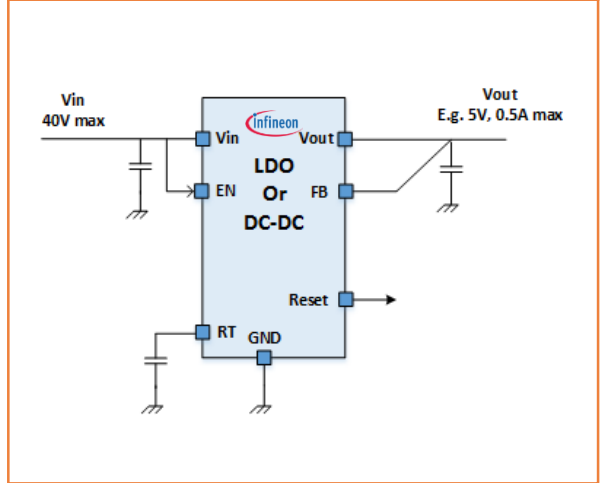
December 2019

From discrete to high Integration
Infineon offers the widest Portfolio

OPTIREG™ Standalone LDO or DC-DC	SBC System Basis Chip Solutions	OPTIREG™ PMIC Multi-Channel Power Supply IC
Linear Voltage Regulator or DC-DC / Switching Regulator	Standalone + Communication + Switches	Multi-Channel Power Supply IC Optimized for Infineon µController Families

Applications
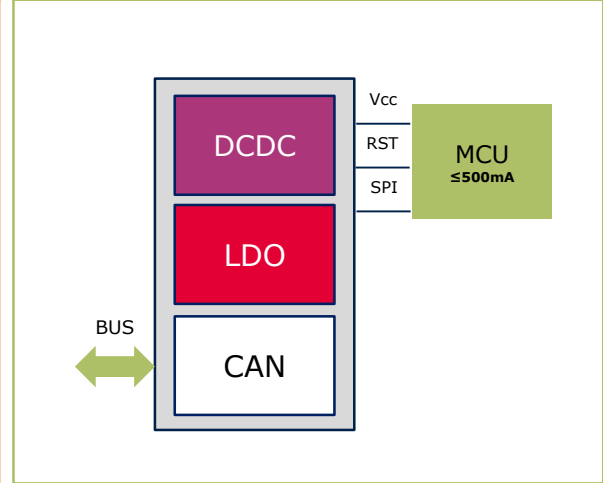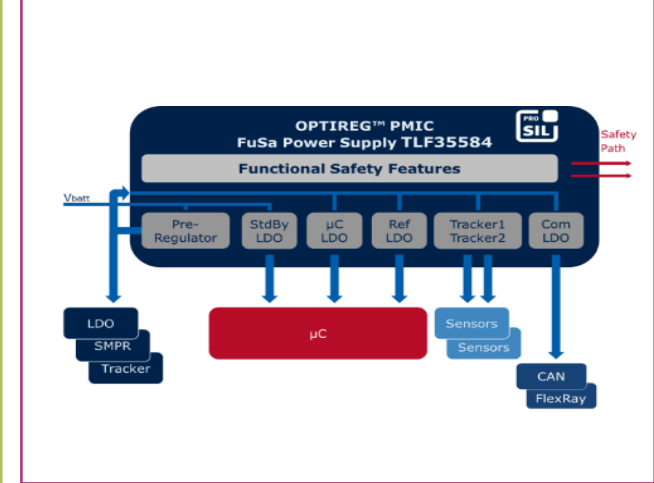
Any Automotive ECU Dashboard, Cluster Telematics, Navigation, Car-Media, Door control , others	Body Control Modules, Climate Control Modules Light Control Units, Gateways	Airbag ,Engine management, Transmission & EPS Camera, Radar, Telematics Safety relevant Applications

Mapping OPTIREG™ Linear with AURIX™ 1G Microcontroller

Infineon AURIX™ Family		Maximum Power Requirements (real power pattern)	OPTIREG™ Linear					
			Ultra Low Quiescent Current			Advanced Feature Set Reset and Watchdog		Post LDO / Core Voltage
			TLS810xxx	TLS820xxx	TLS835xxx	TLS820Fx	TLS850Fx	TLS20x Family
			100mA (5V/3.3V)	200mA (5V/3.3V)	350mA (5V/3.3V)	200mA (5V/3.3V)	500mA (5V/3.3V)	Use in combination with pre dc-dc
1st Gen	TC21 series	88mA @ 3.3V	√	√	√	√	√	TLS202x (150mA)
	TC22 series	88mA @ 3.3V	√	√	√	√	√	TLS202x (150mA)
	TC23 series	109mA @ 3.3V		√	√	√	√	TLS202x (150mA)
	TC26 series	186mA @ 3.3V 123mA @ 5V		√	√	√	√	TLS203x (300mA)
	TC26 series (ADAS variant)	203mA @ 3.3V 134mA @ 5V		√	√	√	√	TLS203x (300mA)
	TC27 series	307mA @ 3.3V 203mA @ 5V			√[1]		√[1]	TLS203x (300mA)
	TC29 series	485mA @ 3.3V 320mA @ 5V			√[1]		√[1]	TLS205x (500mA)
	TC29 series (ADAS variant)	515mA @ 3.3V 340mA @ 5V			√[1]		√[1]	TLS205x (500mA) TLS208x (800mA)

Note:

√[1] High current might lead to limited thermal budget on LDO
√[2] Supply feasible depending on the use case of the µC

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR (T_J = 150°C);
Current Value = Power Dissipation / Voltage Level;
Further support and calculation tools under www.infineon.com/AURIX™

Mapping OPTIREG™ Switcher with AURIX™ 1G Microcontroller

Infineon AURIX™ Family	Maximum Power Dissipation (real power pattern)	OPTIREG™ Switcher for Pre-Regulation and Core Voltages				
		12V Pre-Regulator Low Power DC-DC 500mA			12V Pre-Regulator Medium Power Up-to 2.5A	
		TLF50201 / TLF50211	TLF50241 / TLF50251	TLF50281	TLS4120D0x	TLS4125D0x
		500mA 5V	500mA 5V	500mA 5V	2000mA (5V/3.3V)	2500mA (5V/3.3V)
		Simple or with Enable	Enable and Reset	Watchdog	Enable + Reset	Enable + Reset
1st Gen	TC21 series	88mA @ 3.3V	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	√	√
	TC22 series	88mA @ 3.3V	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	√	√
	TC23 series	109mA @ 3.3V	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	√	√
	TC26 series	186mA @ 3.3V 123mA @ 5V	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	√	√
	TC26 series (ADAS variant)	203mA @ 3.3V 134mA @ 5V	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	√	√
	TC27 series	307mA @ 3.3V 203mA @ 5V	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	√	√
	TC29 series	485mA @ 3.3V 320mA @ 5V	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	√	√
	TC29 series (ADAS variant)	515mA @ 3.3V 340mA @ 5V	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	In Combination with Post LDO (3.3V)	√	√

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR (T_J = 150°C);
Current Value = Power Dissipation / Voltage Level;
Further support and calculation tools under www.infineon.com/sbc and www.infineon.com/AURIX™

Further support and calculation tools under www.Infineon.com/OPTIREG™ and www.infineon.com/AURIX™

Mapping System Basis Chips (SBC) with AURIX™ 1G Microcontroller

Infineon AURIX™ Family		Maximum Power Dissipation (real power pattern)	System Basis Chip (SBC)				
			Lite LDO SBC	Lite DCDC SBC	MR+ SBC	DCDC SBC	MCP+ SBC
			TLE946x(-3)ES	TLE947x(-3)ES	TLE926x(-3)BQX	TLE927xQX	TLE9278(-3)BQX
			150mA (5V/3.3V)	500mA (5V/3.3V)	≥250mA (5V/3.3V)	750mA (5V/3.3V)	750mA (5V/3.3V)
1st Gen	TC21 series	88mA @ 3.3V	√	√	√	√	√
	TC22 series	88mA @ 3.3V	√	√	√	√	√
	TC23 series	109mA @ 3.3V	√2)	√	√	√	√
	TC26 series	186mA @ 3.3V 123mA @ 5V	√2)	√	√	√	√
	TC26 series (ADAS variant)	203mA @ 3.3V 134mA @ 5V	√2)	√	√	√	√
	TC27 series	307mA @ 3.3V 203mA @ 5V		√	√1)	√	√
	TC29 series	485mA @ 3.3V 320mA @ 5V		√	√1)	√	√
	TC29 series (ADAS variant)	515mA @ 3.3V 340mA @ 5V		√2)	√1)	√	√

Note:

√1) Supply feasible in combination with load sharing on VCC3
√2) Supply feasible depending on the use case of the µC

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR (T_J = 150°C);
Current Value = Power Dissipation / Voltage Level;
Further support and calculation tools under www.infineon.com/sbc and www.infineon.com/AURIX™

Further support and calculation tools under www.Infineon.com/OPTIREG™ and www.infineon.com/AURIX™

Mapping OPTIREG™ PMIC with AURIX™ 1G Microcontroller

Infineon AURIX™ Family		Maximum Power Dissipation (real power pattern)	OPTIREG™ PMIC			
			ISO26262 compliant	ISO26262 compliant	ISO26262 ready	ISO26262 ready
			TLF35584/5Q*	TLF35584/5Q* w/ TLF11251	TLF30681QV	TLF30682QV
1st Gen	TC21 series	88mA @ 3.3V	√	√	√	√
	TC22 series	88mA @ 3.3V	√	√	√	√
	TC23 series	109mA @ 3.3V	√	√	√	√
	TC26 series	186mA @ 3.3V 123mA @ 5V	√	√	√	√
	TC26 series (ADAS variant)	203mA @ 3.3V 134mA @ 5V	√	√	√	√
	TC27 series	307mA @ 3.3V 203mA @ 5V	√	√	√	√
	TC29 series	485mA @ 3.3V 320mA @ 5V	√(2)	√	√(2)	√
	TC29 series (ADAS variant)	515mA @ 3.3V 340mA @ 5V	√(2)	√	√(2)	√

Note:

√(1) Supply feasible in combination with load sharing on VCC3
√(2) Supply feasible depending on the use case of the µC

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR (T_J = 150°C);
Current Value = Power Dissipation / Voltage Level;
Further support and calculation tools under www.infineon.com/sbc and www.infineon.com/AURIX™

Further support and calculation tools under www.Infineon.com/OPTIREG™ and www.infineon.com/AURIX™

Mapping OPTIREG™ Linear with AURIX™ 2G Microcontroller

Infineon AURIX™ Family		Maximum Power Requirements (real power pattern)	OPTIREG™ Linear					
			Ultra Low Quiescent Current			Advanced Feature Set Reset and Watchdog		Post LDO / Core Voltage
			TLS810xxx	TLS820xxx	TLS835xxx	TLS820Fx	TLS850Fx	TLS20x Family
			100mA (5V/3.3V)	200mA (5V/3.3V)	350mA (5V/3.3V)	200mA (5V/3.3V)	500mA (5V/3.3V)	Use in combination with pre dc-dc
2nd Gen	TC33 series	200mA @ 3.3V 132mA @ 5V		√	√	√	√	TLS202x (150mA)
	TC33 series (ADAS variant)	381mA @ 3.3V 252mA @ 5V		√	√	√	√	TLS202x (150mA)
	TC35 series	576mA @ 3.3V 380mA @ 5V		√	√	√	√	TLS202x (150mA)
	TC36 series	333mA @ 3.3V 240mA @ 5V		√	√	√	√	TLS203x (300mA)
	TC37 series	370mA @ 3.3V 244mA @ 5V		√	√	√	√	TLS203x (300mA)
	TC38 series	515mA @ 3.3V 340mA @ 5V						TLS203x (300mA)
	TC39 series	758mA @ 3.3V 500mA @ 5V						TLS205x (500mA)
	TC39 series (ADAS variant)	679 mA @ 3.3V (T_J = 125°C) 448 mA @ 5V (T_J = 125°C)						TLS205x (500mA) TLS208x (800mA)

Note:

√[1] High current might lead to limited thermal budget on LDO

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR (T_J = 150°C);
Current Value = Power Dissipation / Voltage Level;
Further support and calculation tools under www.infineon.com/AURIX™

Mapping OPTIREG™ Switcher with AURIX™ 2G Microcontroller

Infineon AURIX™ Family		Maximum Power Dissipation (real power pattern)	OPTIREG™ Switcher for Pre-Regulation and Core Voltages				
			12V Pre-Regulator Low Power DC-DC 500mA			12V Pre-Regulator Medium Power Up-to 2.5A	
			TLF50201 / TLF50211	TLF50241 / TLF50251	TLF50281	TLS4120D0x	TLS4125D0x
			500mA 5V	500mA 5V	500mA 5V	2000mA (5V/3.3V)	2500mA (5V/3.3V)
			Simple or with Enable	Enable and Reset	Watchdog	Enable + Reset	Enable + Reset
2nd Gen	TC33 series	200mA @ 3.3V 132mA @ 5V	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	√	√
	TC33 series (ADAS variant)	381mA @ 3.3V 252mA @ 5V	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	√	√
	TC35 series	576mA @ 3.3V 380mA @ 5V	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	√	√
	TC36 series	333mA @ 3.3V 240mA @ 5V	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	√	√
	TC37 series	370mA @ 3.3V 244mA @ 5V	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	√	√
	TC38 series	515mA @ 3.3V 340mA @ 5V	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	√	√
	TC39 series	758mA @ 3.3V 500mA @ 5V	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	√	√
	TC39 series (ADAS variant)	679 mA @ 3.3V (T_J = 125°C) 448 mA @ 5V (T_J = 125°C)	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	√	√

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR (T_J = 150°C);
Current Value = Power Dissipation / Voltage Level;
Further support and calculation tools under www.infineon.com/sbc and www.infineon.com/AURIX™

Further support and calculation tools under www.Infineon.com/OPTIREG™ and www.infineon.com/AURIX™

Mapping System Basis Chips & OPTIREG™ PMIC with AURIX™ 2G Microcontroller

Infineon AURIX™ Family		Maximum Power Dissipation (real power pattern)	System Basis Chip (SBC)					OPTIREG™ PMIC			
			Lite LDO SBC	Lite DCDC SBC	MR+ SBC	DCDC SBC	MCP+ SBC	ISO26262 compliant	ISO26262 compliant	ISO26262 ready	ISO26262 ready
			TLE946x(-3)ES	TLE947x(-3)ES	TLE926x(-3)BQX	TLE927xQX	TLE9278(-3)BQX	TLF35584/5Q*	TLF35584/5Q* w/ TLF11251	TLF30681QV	TLF30682QV
			150mA (5V/3.3V)	500mA (5V/3.3V)	≥250mA (5V/3.3V)	750mA (5V/3.3V)	750mA (5V/3.3V)				
2nd Gen	TC33 series	200mA @ 3.3V 132mA @ 5V	√[2]	√	√	√	√	√	√	√	√
	TC33 series (ADAS variant)	381mA @ 3.3V 252mA @ 5V		√	√[1]	√	√	√	√	√	√
	TC35 series	576mA @ 3.3V 380mA @ 5V		√[2]		√	√	√	√	√	√
	TC36 series	333mA @ 3.3V 240mA @ 5V		√	√[1]	√	√	√	√	√	√
	TC37 series	370mA @ 3.3V 244mA @ 5V		√	√[1]	√	√	√	√	√	√
	TC38 series	515mA @ 3.3V 340mA @ 5V		√[2]		√	√	√[2]	√	√[2]	√
	TC39 series	758mA @ 3.3V 500mA @ 5V		√[2]		√[2]	√[2]	√[2]	√	√[2]	√
	TC39 series (ADAS variant)	679 mA @ 3.3V (T_J = 125°C) 448 mA @ 5V (T_J = 125°C)		√[2]		√[2]	√[2]	√[2]	√	√[2]	√

Note:
√[1] Supply feasible in combination with load sharing on VCC3
√[2] Supply feasible depending on the use case of the µC

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR (T_J = 150°C);
Current Value = Power Dissipation / Voltage Level;
Further support and calculation tools under www.infineon.com/sbc and www.infineon.com/AURIX™

Further support and calculation tools under www.Infineon.com/OPTIREG™
and www.infineon.com/AURIX™

Part of your life. Part of tomorrow.

infineon