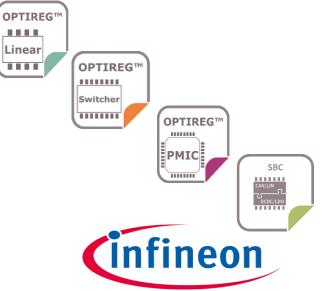


Powering Microcontrollers with OPTIREG[™] and SBC Products



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
Vin 40V max Vin filmen LDO EN Or FB DC-DC Reset	UCU BUS CAN	OPTIREG ^{IM} PMIC Safety Fusa Power Supply TLF35584 Path Functional Safety Features Path Pre- StdBy µC Regulator LDO LDO LDO LDO LDO Smpr yuc Sensors Tracker CAN FexRay
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



			OPTIREG™ Linear							
	Infineon AURIX™	Maximum Power	Ultra	a Low Quiescent Curre	nt	Advanced Reset and	Post LDO / Core Voltage			
	Family	Requirements (real power pattern)	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		
	TC21 series	88mA @ 3.3V	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	TLS202x (150mA)		
	TC22 series	88mA @ 3.3V	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	TLS202x (150mA)		
	TC23 series	109mA @ 3.3V		\checkmark	\checkmark	\checkmark	\checkmark	TLS202x (150mA)		
	TC26 series	186mA @ 3.3V 123mA @ 5V		\checkmark	\checkmark	\checkmark	\checkmark	TLS203x (300mA)		
1 st Gen	TC26 series (ADAS variant)	203mA @ 3.3V 134mA @ 5V		\checkmark	V	\checkmark	\checkmark	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:

 $V^{1)}$ High current might lead to limited thermal budget on LDO

 $\nu^{_{2)}}\,$ 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 <u>www.infineon.com/</u>AURIX[™]

Mapping OPTIREG[™] Switcher with AURIX[™] 1G Microcontroller



				OPTIREG™ Switch	er for Pre-Regulation and Core V	/oltages	
Infineon				12V Pre-Regulator Low Power DC-DC 500m	12V Pre-Regulator Medium Power Up-to 2.5A		
	AURIX™	Maximum Power Dissipation (real power pattern)	TLF50201 / TLF50211	TLF50241 / TLF50251	TLF50281	TLS4120D0x	TLS4125D0x
	Family		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
	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)	\checkmark	\checkmark
	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)	\checkmark	\checkmark
	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)	\checkmark	\checkmark
	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)	\checkmark	\checkmark
1 st Gen	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)	\checkmark	\checkmark
	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)	\checkmark	\checkmark
	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)	٨	1
	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)	1	\checkmark

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 <u>www.infineon.com/sbc</u> and <u>www.infineon.com/</u>AURIX[™]

Further support and calculation tools under <u>www.Infineon.com/</u>OPTIREG[™] and <u>www.infineon.com/</u>AURIX[™]

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



Infineon AURIX™ Family			System Basis Chip (SBC)						
		Maximum Power Dissipation	Lite LDO SBC	Lite DCDC SBC	MR+ SBC	DCDC SBC	MCP+ SBC		
		(real power pattern)	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)		
	TC21 series	88mA @ 3.3V	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		
	TC22 series	88mA @ 3.3V	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		
	TC23 series	109mA @ 3.3V	√2)	\checkmark	\checkmark	\checkmark	\checkmark		
1 st	TC26 series	186mA @ 3.3V 123mA @ 5V	√2)	\checkmark	\checkmark	λ	\checkmark		
Gen	TC26 series (ADAS variant)	203mA @ 3.3V 134mA @ 5V	√2)	\checkmark	\checkmark	λ	\checkmark		
	TC27 series	307mA @ 3.3V 203mA @ 5V		\checkmark	√1)	V	\checkmark		
	TC29 series	485mA @ 3.3V 320mA @ 5V		\checkmark	√1)	λ	\checkmark		
	TC29 series (ADAS variant)	515mA @ 3.3V 340mA @ 5V		√2)	√1)	\checkmark	\checkmark		

Note:

 $V^{1)}$ Supply feasible in combination with load sharing on VCC3

 $V^{2)}$ 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 <u>www.infineon.com/sbc</u> and <u>www.infineon.com/</u> AURIX™

Further support and calculation tools under <u>www.Infineon.com/</u>OPTIREG[™] and <u>www.infineon.com/</u>AURIX[™]

Mapping OPTIREG[™] PMIC with AURIX[™] 1G Microcontroller



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

Note:

 $v^{(1)}$ Supply feasible in combination with load sharing on VCC3

 $v^{2)}$ 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 <u>www.infineon.com/sbc</u> and <u>www.infineon.com/</u>AURIX[™]

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

Mapping OPTIREG[™] Linear with AURIX[™] 2G Microcontroller



			OPTIREG™ Linear							
Infineon AURIX™		Maximum Power	Ultra	Low Quiescent Curr	ent	Advanced Reset and	Post LDO / Core Voltage			
	Family	Requirements (real power pattern)	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		
	TC33 series	200mA @ 3.3V 132mA @ 5V		\checkmark	\checkmark	\checkmark	\checkmark	TLS202x (150mA)		
	TC33 series (ADAS variant)	381mA @ 3.3V 252mA @ 5V		\checkmark	\checkmark	\checkmark	\checkmark	TLS202x (150mA)		
	TC35 series	576mA @ 3.3V 380mA @ 5V		\checkmark	\checkmark	\checkmark	\checkmark	TLS202x (150mA)		
	TC36 series	333mA @ 3.3V 240mA @ 5V		\checkmark	\checkmark	\checkmark	\checkmark	TLS203x (300mA)		
2 nd Gen	TC37 series	370mA @ 3.3V 244mA @ 5V		\checkmark	\checkmark	\checkmark	\checkmark	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:

 ${\bf V}^{1)}~~{\rm High}~{\rm current}~{\rm might}~{\rm lead}~{\rm to}~{\rm limited}~{\rm thermal}~{\rm budget}~{\rm on}~{\rm LDO}$

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 <u>www.infineon.com/</u>AURIX™

Mapping OPTIREG[™] Switcher with AURIX[™] 2G Microcontroller



				OPTIREG™ Switche	Voltages		
	Infineon	Mavimum Dawar Diabinatian		12V Pre-Regulator Low Power DC-DC 500n	12V Pre-Regulator Medium Power Up-to 2.5A		
	AURIX™	Maximum Power Dissipation (real power pattern)	TLF50201 / TLF50211 TLF50241 / TLF50251		TLF50281	TLS4120D0x	TLS4125D0x
	Family	(00. 2000 2000)	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
	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	\checkmark	\checkmark
	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	\checkmark	\checkmark
	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	\checkmark	\checkmark
	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	\checkmark	\checkmark
2 nd Gen	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	\checkmark	\checkmark
	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	\checkmark	\checkmark
	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	\checkmark	\checkmark
	TC39 series (ADAS variant)	679 mA @ 3.3V (Tյ = 125°C) 448 mA @ 5V (Tյ = 125°C)	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	3.3V In Combination with Post LDO	\checkmark	\checkmark

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 <u>www.infineon.com/sbc</u> and <u>www.infineon.com/</u>AURIX[™]

Further support and calculation tools under <u>www.Infineon.com/</u>OPTIREG[™] and <u>www.infineon.com/</u>AURIX[™]

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



Infineon AURIX™			System Basis Chip (SBC)					OPTIREG™ PMIC			
		Maximum Power Dissipation	Lite LDO SBC	Lite DCDC SBC	MR+ SBC	DCDC SBC	MCP+ SBC	ISO26262 compliant	ISO26262 compliant	ISO26262 ready	ISO26262 ready
	Family	(real power pattern)	TLE946x(-3)ES	TLE947x(-3)ES	TLE926x(-3)BQX	TLE927xQX	TLE9278(-3)BQX	TLF35584/5Q*	TLF35584/5Q*	TLF30681QV	TLF30682QV
			150mA (5V/3.3V)	500mA (5V/3.3V)	≥250mA (5V/3.3V)	750mA (5V/3.3V)	750mA (5V/3.3V)	TEL22204/20	w/ TLF11251	TLF3000TQV	1LF30062QV
	TC33 series	200mA @ 3.3V 132mA @ 5V	√2)	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
	TC33 series (ADAS variant)	381mA @ 3.3V 252mA @ 5V		\checkmark	√1)	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
	TC35 series	576mA @ 3.3V 380mA @ 5V		_√ 2)		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
2 nd	TC36 series	333mA @ 3.3V 240mA @ 5V		\checkmark	√1)	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Gen	TC37 series	370mA @ 3.3V 244mA @ 5V		\checkmark	√ 1)	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
	TC38 series	515mA @ 3.3V 340mA @ 5V		_√ 2)		\checkmark	\checkmark	√2)	\checkmark	√2)	\checkmark
	TC39 series	758mA @ 3.3V 500mA @ 5V		√ 2)		√2)	√2)	√2)	\checkmark	√2)	\checkmark
	TC39 series (ADAS variant)	679 mA @ 3.3V (T ₃ = 125°C) 448 mA @ 5V (T ₃ = 125°C)		√2)		√2)	√2)	√2)	\checkmark	√2)	\checkmark

Note: v¹⁾ Supply feasible in combination with load sharing on VCC3

 $\nu^{2)}~$ 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 <u>www.infineon.com/sbc</u> and <u>www.infineon.com/</u>AURIX[™]

Further support and calculation tools under <u>www.Infineon.com/</u>OPTIREG[™] and <u>www.infineon.com/</u>AURIX[™]

9



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