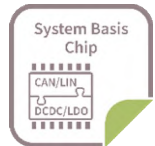
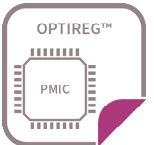




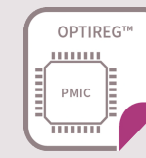
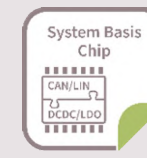
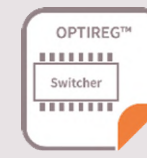
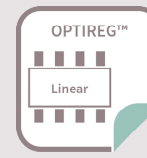
# Powering AURIX™ $\mu$ C with OPTIREG™ and System Basis Chips (SBC)



April 2020



# From discrete to high Integration Infineon offers the widest Portfolio



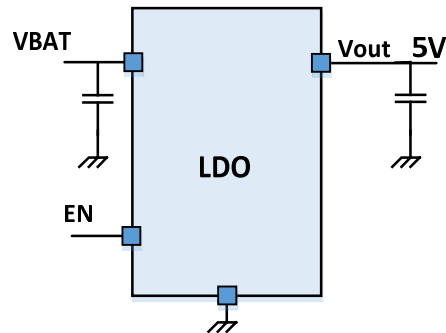
**OPTIREG™ linear**  
Standalone LDO

**OPTIREG™ switcher**  
Standalone DC-DC

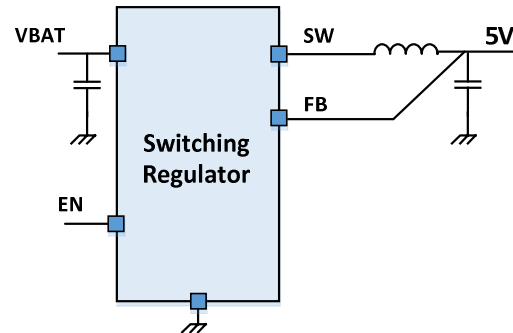
**System Basis Chip (SBC)**  
Power Supply & Communication

**OPTIREG™ PMIC**  
Multi-Channel Power Supply IC

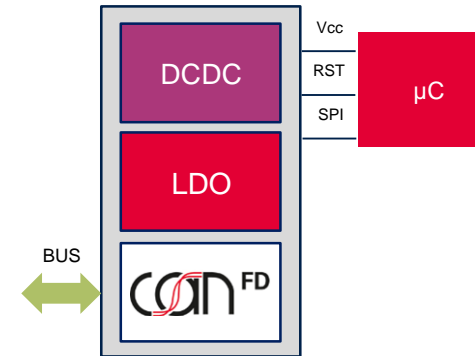
Linear Voltage Regulator



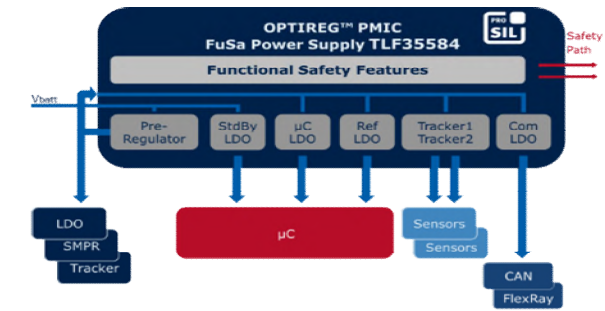
DC-DC / Switching Regulator



Voltage Regulator (Linear or DCDC)  
+ Communication + Switches



Multi-Channel Power Supply IC  
Optimized for Infineon μController Families



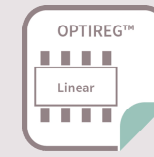
## Applications

Any Automotive ECU  
Dashboard, Cluster  
Telematics, Navigation, Car-Media,  
Door control, Seat, Sunroof, others

Body Control Modules, Gateways  
Climate Control Modules  
Light Control Units, Passive Keyless Entry  
On-board Charger, eSound

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
1 <sup>st</sup> 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		√ <sup>2)</sup>	√	√ <sup>2)</sup>	√	TLS203x (300mA)
	TC27 series	307mA @ 3.3V 203mA @ 5V			√ <sup>1)</sup>		√ <sup>1)</sup>	TLS203x (300mA)
	TC29 series	485mA @ 3.3V 320mA @ 5V			√ <sup>2)</sup>		√ <sup>2)</sup>	TLS205x (500mA)
	TC29 series (ADAS variant)	515mA @ 3.3V 340mA @ 5V			√ <sup>2)</sup>		√ <sup>2)</sup>	TLS205x (500mA) TLS208x (800mA)

**Note:**

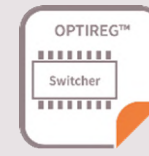
√<sup>1)</sup> High current might lead to limited thermal budget on LDO

√<sup>2)</sup> Supply feasible depending on the use case of the μC

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR ( $T_J = 150^\circ\text{C}$ );  
Current Value = Power Dissipation / Voltage Level;

Further support and calculation tools under  
[www.infineon.com/OPTIREG™](http://www.infineon.com/OPTIREG™) and [www.infineon.com/AURIX™](http://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	
1 <sup>st</sup> Gen	TC21 series	88mA @ 3.3V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC22 series	88mA @ 3.3V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC23 series	109mA @ 3.3V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC26 series	186mA @ 3.3V 123mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC26 series (ADAS variant)	203mA @ 3.3V 134mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC27 series	307mA @ 3.3V 203mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC29 series	485mA @ 3.3V 320mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC29 series (ADAS variant)	515mA @ 3.3V 340mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√

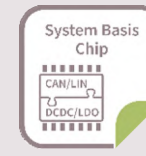
## Note:

√<sup>(1)</sup> For 3.3V in combination with a post LDO

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR ( $T_j = 150^\circ\text{C}$ );  
Current Value = Power Dissipation / Voltage Level;

Further support and calculation tools under  
[www.infineon.com/OPTIREG™](http://www.infineon.com/OPTIREG™) and [www.infineon.com/AURIX™](http://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 150mA (5V/3.3V)	TLE947x(-3)ES 500mA (5V/3.3V)	TLE926x(-3)BQX ≥250mA (5V/3.3V)	TLE927xQX 750mA (5V/3.3V)	TLE9278(-3)BQX 750mA (5V/3.3V)
1 <sup>st</sup> Gen	TC21 series	88mA @ 3.3V	√	√	√	√	√
	TC22 series	88mA @ 3.3V	√	√	√	√	√
	TC23 series	109mA @ 3.3V	√ <sup>2)</sup>	√	√	√	√
	TC26 series	186mA @ 3.3V 123mA @ 5V	√ <sup>2)</sup>	√	√	√	√
	TC26 series (ADAS variant)	203mA @ 3.3V 134mA @ 5V	√ <sup>2)</sup>	√	√	√	√
	TC27 series	307mA @ 3.3V 203mA @ 5V		√	√ <sup>1)</sup>	√	√
	TC29 series	485mA @ 3.3V 320mA @ 5V		√	√ <sup>1)</sup>	√	√
	TC29 series (ADAS variant)	515mA @ 3.3V 340mA @ 5V		√ <sup>2)</sup>	√ <sup>1)</sup>	√	√

**Note:**

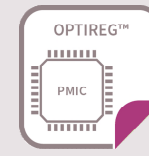
√<sup>1)</sup> Supply feasible in combination with load sharing on VCC3

√<sup>2)</sup> 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<sub>J</sub> = 150°C);  
Current Value = Power Dissipation / Voltage Level;

Further support and calculation tools under [www.infineon.com/SBC](http://www.infineon.com/SBC)  
and [www.infineon.com/AURIX™](http://www.infineon.com/AURIX™)

# Mapping OPTIREG™ PMIC with AURIX™ 1G Microcontroller



Infineon AURIX™ Family		Maximum Power Dissipation (real power pattern)	OPTIREG™ PMIC		
			ISO26262 compliant		
			TLF35584/5Q*	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	√ <sup>2)</sup>	√ <sup>2)</sup>	√
	TC29 series (ADAS variant)	515mA @ 3.3V 340mA @ 5V	√ <sup>2)</sup>	√ <sup>2)</sup>	√

## Note:

√<sup>1)</sup> Supply feasible in combination with load sharing on VCC3

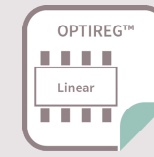
√<sup>2)</sup> Supply feasible depending on the use case of the μC

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR ( $T_j = 150^\circ\text{C}$ );  
Current Value = Power Dissipation / Voltage Level;

Further support and calculation tools under  
[www.infineon.com/OPTIREG™](http://www.infineon.com/OPTIREG™) and [www.infineon.com/AURIX™](http://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			√ <sup>2)</sup>		√ <sup>2)</sup>	TLS202x (150mA)
	TC35 series	576mA @ 3.3V 380mA @ 5V			√ <sup>2)</sup>		√ <sup>2)</sup>	TLS202x (150mA)
	TC36 series	333mA @ 3.3V 240mA @ 5V			√ <sup>2)</sup>		√ <sup>2)</sup>	TLS203x (300mA)
	TC37 series	370mA @ 3.3V 244mA @ 5V			√ <sup>2)</sup>		√ <sup>2)</sup>	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 <sub>J</sub> = 125°C) 448 mA @ 5V (T <sub>J</sub> = 125°C)						TLS205x (500mA) TLS208x (800mA)

## Note:

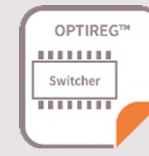
√<sup>1)</sup> High current might lead to limited thermal budget on LDO

√<sup>2)</sup> 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<sub>J</sub> = 150°C);  
Current Value = Power Dissipation / Voltage Level;

Further support and calculation tools under  
[www.infineon.com/OPTIREG™](http://www.infineon.com/OPTIREG™) and [www.infineon.com/AURIX™](http://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
2 <sup>nd</sup> Gen	TC33 series	200mA @ 3.3V 132mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC33 series (ADAS variant)	381mA @ 3.3V 252mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC35 series	576mA @ 3.3V 380mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC36 series	333mA @ 3.3V 240mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC37 series	370mA @ 3.3V 244mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC38 series	515mA @ 3.3V 340mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC39 series	758mA @ 3.3V 500mA @ 5V	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√
	TC39 series (ADAS variant)	679 mA @ 3.3V (T <sub>J</sub> = 125°C) 448 mA @ 5V (T <sub>J</sub> = 125°C)	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√ <sup>(1)</sup>	√	√

## Note:

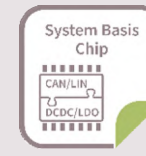
√<sup>(1)</sup> For 3.3V in combination with a post LDO

Based on **Maximum Power Dissipation** (at real power pattern) see datasheet parameter PD SR (T<sub>J</sub> = 150°C);  
Current Value = Power Dissipation / Voltage Level;

Further support and calculation tools under  
[www.infineon.com/OPTIREG™](http://www.infineon.com/OPTIREG™) and [www.infineon.com/AURIX™](http://www.infineon.com/AURIX™)



# Mapping System Basis Chips (SBC) with AURIX™ 2G 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 150mA (5V/3.3V)	TLE947x(-3)ES 500mA (5V/3.3V)	TLE926x(-3)BQX ≥250mA (5V/3.3V)	TLE927xQX 750mA (5V/3.3V)	TLE9278(-3)BQX 750mA (5V/3.3V)
2 <sup>nd</sup> Gen	TC33 series	200mA @ 3.3V 132mA @ 5V	√ <sup>(2)</sup>	√	√	√	√
	TC33 series (ADAS variant)	381mA @ 3.3V 252mA @ 5V		√	√ <sup>(1)</sup>	√	√
	TC35 series	576mA @ 3.3V 380mA @ 5V		√ <sup>(2)</sup>		√	√
	TC36 series	333mA @ 3.3V 240mA @ 5V		√	√ <sup>(1)</sup>	√	√
	TC37 series	370mA @ 3.3V 244mA @ 5V		√	√ <sup>(1)</sup>	√	√
	TC38 series	515mA @ 3.3V 340mA @ 5V		√ <sup>(2)</sup>		√	√
	TC39 series	758mA @ 3.3V 500mA @ 5V		√ <sup>(2)</sup>		√ <sup>(2)</sup>	√ <sup>(2)</sup>
	TC39 series (ADAS variant)	679 mA @ 3.3V (T <sub>J</sub> = 125°C) 448 mA @ 5V (T <sub>J</sub> = 125°C)		√ <sup>(2)</sup>		√ <sup>(2)</sup>	√ <sup>(2)</sup>

**Note:**

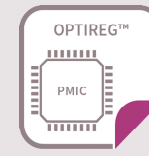
√<sup>(1)</sup> Supply feasible in combination with load sharing on VCC3

√<sup>(2)</sup> 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<sub>J</sub> = 150°C);  
Current Value = Power Dissipation / Voltage Level;

Further support and calculation tools under [www.infineon.com/SBC](http://www.infineon.com/SBC)  
and [www.infineon.com/AURIX™](http://www.infineon.com/AURIX™)

# Mapping OPTIREG™ PMIC with AURIX™ 2G Microcontroller



Infineon AURIX™ Family		Maximum Power Dissipation (real power pattern)	OPTIREG™ PMIC			
			ISO26262 compliant	ISO26262 compliant		
			TLF35584/5Q*	TLF35584/5Q* w/ TLF11251	TLF30681QV	TLF30682QV
2 <sup>nd</sup> Gen	TC33 series	200mA @ 3.3V 132mA @ 5V	√	√	√	√
	TC33 series (ADAS variant)	381mA @ 3.3V 252mA @ 5V	√	√	√	√
	TC35 series	576mA @ 3.3V 380mA @ 5V	√	√	√	√
	TC36 series	333mA @ 3.3V 240mA @ 5V	√	√	√	√
	TC37 series	370mA @ 3.3V 244mA @ 5V	√	√	√	√
	TC38 series	515mA @ 3.3V 340mA @ 5V	√ <sup>2)</sup>	√	√ <sup>2)</sup>	√
	TC39 series	758mA @ 3.3V 500mA @ 5V	√ <sup>2)</sup>	√	√ <sup>2)</sup>	√
	TC39 series (ADAS variant)	679 mA @ 3.3V (T <sub>J</sub> = 125°C) 448 mA @ 5V (T <sub>J</sub> = 125°C)	√ <sup>2)</sup>	√	√ <sup>2)</sup>	√

## Note:

√<sup>1)</sup> Supply feasible in combination with load sharing on VCC3

√<sup>2)</sup> 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<sub>J</sub> = 150°C);  
Current Value = Power Dissipation / Voltage Level;

Further support and calculation tools under [www.infineon.com/SBC](http://www.infineon.com/SBC)  
[www.infineon.com/OPTIREG™](http://www.infineon.com/OPTIREG™) and [www.infineon.com/AURIX™](http://www.infineon.com/AURIX™)

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