Multifunkční regulátor E12-14V

- Plně jednolitý design
- Teplotní ochrana
- Ochrana před zkratem
- Komplexní diagnostika
- DFM výstup

Popis:

Jedná se o multifunkční autooscilační regulátory pro alternátory v automobilech. Obsahují kontrolní sekci, budící sekci a diagnostický okruh, který ovládá varovnou kontrolku.

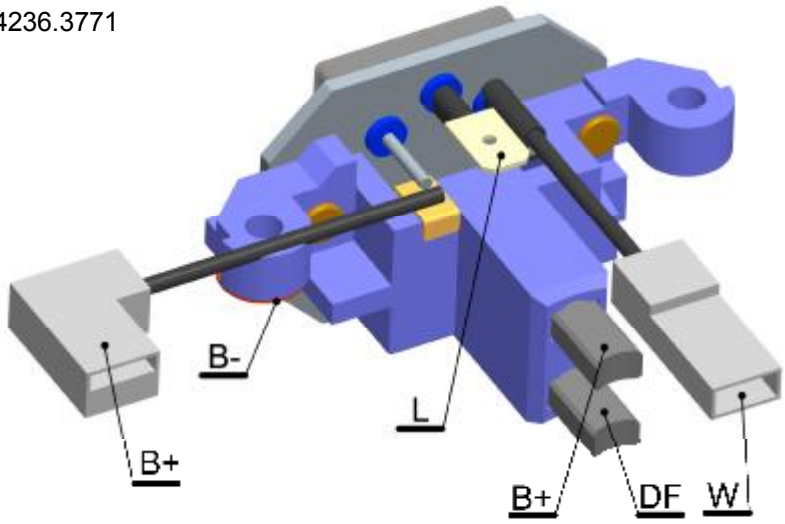
.

Alternator: Radiovolna 4231.3771-4236.3771

Radiovolna 4242.3771

85A, 110A, 120A

Application: MAZ



PIN FUNCTION

N°	Pin	**Description**
1	L	Lamp terminal low side driver; relay terminal high side driver
2	W	Phase sense input
3	B-	Ground
4	DF	Field low side driver output
5	B+	Alternator output sense and voltage supply

THERMAL DATA

Symbol	Parameter	Value	Unit
T_{case}	Case Temperature	-40 to 150	°C
T_{stg}	Storage Temperature	-40 to 170	°C
T_{sh}	Thermal shutdown	185 ±15	°C
$R_{th\ j\text{-}case}$	Thermal Resistance Junction Case	1.5	°C/W

ELECTRICAL CHARACTERISTCS (T_{case} = -40°C to 125°C; unless otherwise specified)

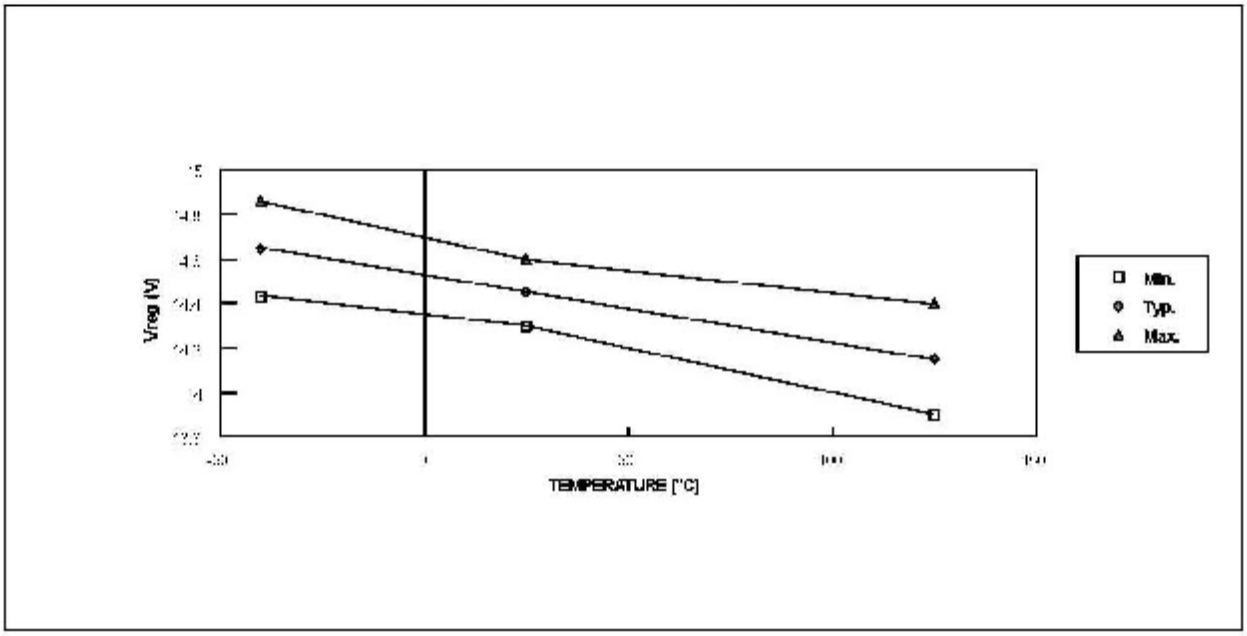
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_{bat}	Operating Supply Voltage		8.5		18	V
I_{bsink}	Supply Battery Curren:				50	mA
I_{bstby}	Stand-by Current	V_{bat} = 12V, T = 25°C			300	µA
		V_{bat} = 12V, T = 40°C			500	
V_{reg}	Regulated Voltage & Therm. Drift (standard version)	Ial: = 0.5 · Inom; rpm = 0.5 · RPMMAX; T = 20°C	14.3 -4	14.45 -3	14.6 -2	V mV/°C
f_{sw}	Switching Frequency	in FSDF	30		400	Hz
V_{rpm}	Delta V_{rpm}	1800 < rpm < 12000; Ial: = 0.3 · Inom			200	mV
V_{load}	Delta V_{load}	0.1 · Inom < Ial: < 0.9 · Inom; rpm = 0.5 · rpmmax			200	mV
V_{reg}	Reg. Voltage without Battery	Ial: = 3A resistive			16	V
V_{DV}	L Drivers Disable Thereshold	Vcltage on pin A+ to have L = OFF	18		22	V
$T_{j\text{-}sd}$	Thermal Shut-down	DF = OFF STATE L – OFF STATE	170		200	°C
$T_{j\text{-}sd\text{-}hys}$	Thermal Shut-down Hysteresis	DF, L = frcm off state (due to thermal shutdown) to on	2		10	°C
R_{on}	Low Side Driver R_{dson}	T – 150°C; I – 5A			230	mΩ
R_{on}	Low Side Driver R_{dson}	T = 25°C; I = 5A			130	mΩ
V_F	Freewheeling Diode DF	IF = 5A			2	V
If_{SC}	Short Circuit Threshold DF	DF – 12V; T – -40 to 25°C	8.5		18	A
If_{SC}	Short Circuit Threshold DF	DF = 12V; T = 25 to 125°C	7		18	A
Vs1	Output Short to GROUND Threshole DF		2.1		3.9	V
FS_{DF}	Pre-excitation F.S.D.F	f = 348Hz ±15%	10.62	±2.5	14.38	%

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_{dfml}	Short Circuit Protection DFM	VDF_MON = 12V	25		200	mA
I_k	Output Leakage Current DFM	VDF_MON = 24V			0.1	mA
t_TM	DFM Output Voltage rise time	R = 2.7kΩ; C = 1nF; V_{alim} = 13.5V	0.05		50	µs
T_TD	DFM Output Voltage fall time	R = 2.7kΩ; C = 1nF; V_{alim} = 13.5V	0.05		50	µs

THERMAL COMPENSATION (Vreg, standard version)

Temperature [°C]	V_{reg}		
	Min. [V]	Typ. [V]	Max. [V]
-40	14.43	14.645	14.86
25	14.30	14.45	14.60
125	13.90	14.15	14.40

Figure 1. Thermal Compensation (Vreg, standard version)



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	DC Supply Voltage (2 min. @ 25°)	24	V
	Transient Supply Voltage (load dump), t < 0.5s @ 25°C	40	V
	Transient Supply Voltage (low energy spikes pulse ISO7637/1)	60	V
Io	Output Current Capability	Internally limited	A
P_{tot}	Power Dissipation(@ T_{case} = 150°C, I_{load} = 5A)	tbd	
	Reverse Voltage all pins @ 25°C, T = 15s	-2.5	V
	DC Pin Current (bonding limitation) on DF, B+, B- pins	11	A
	EDS Voltage (Human body model)	±4	KV

Figure 2. Load Transient Example.

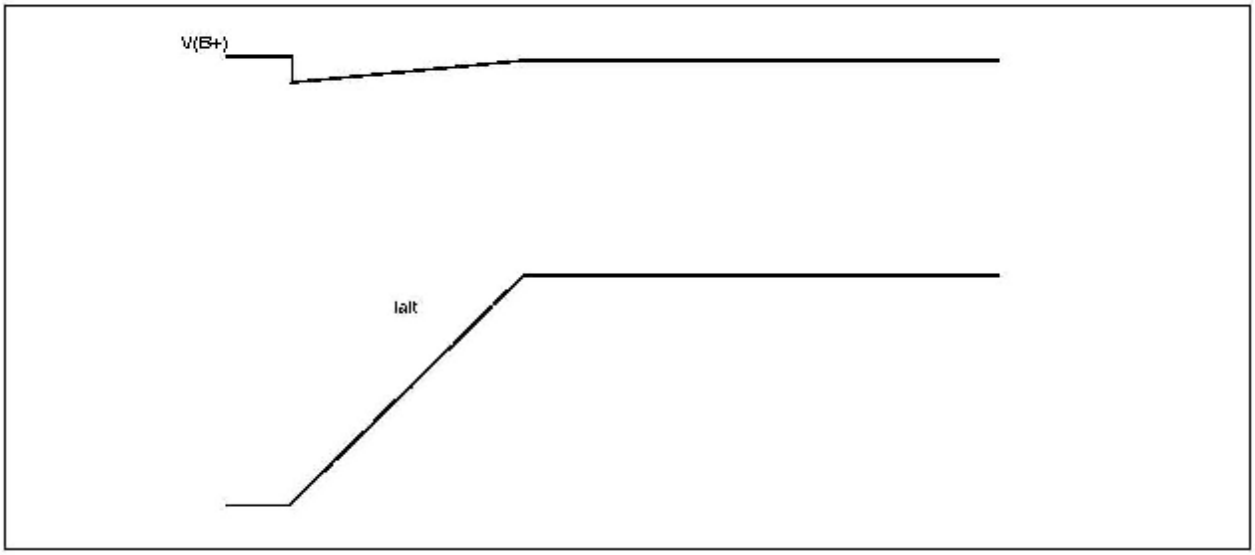


Figure 3. Start-Up Timing

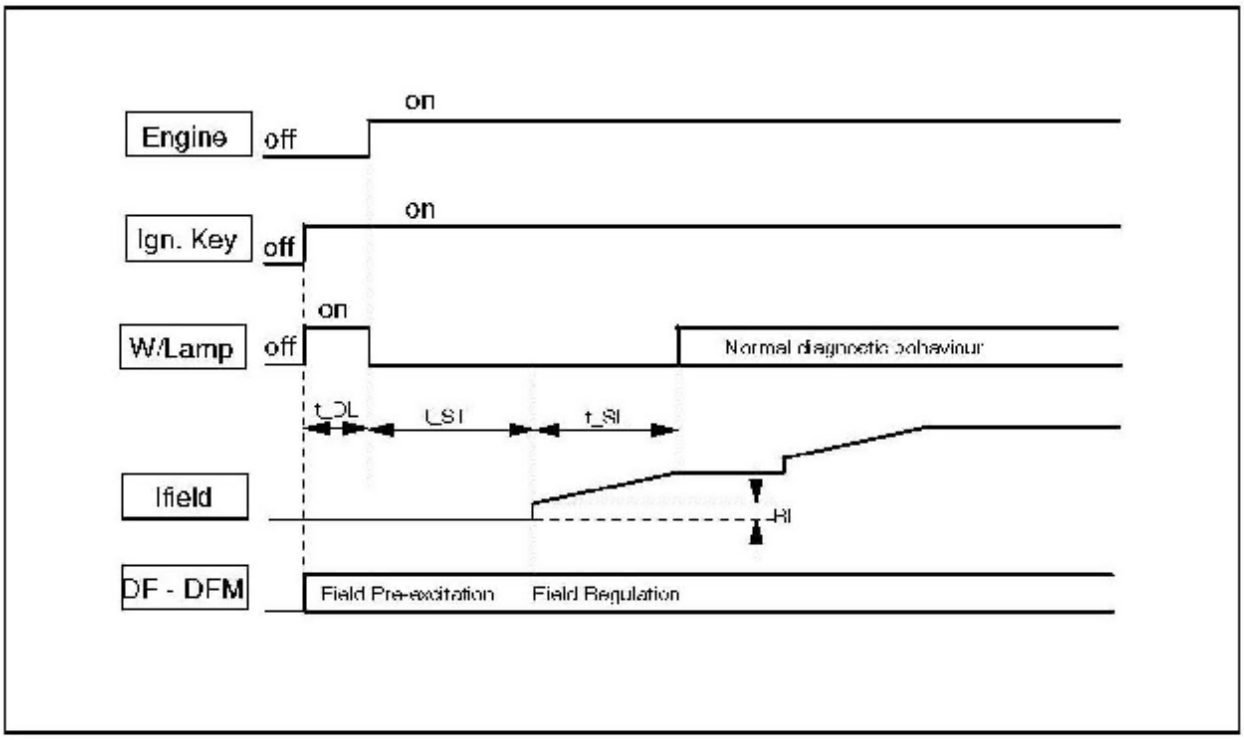


Table 1. Fault Detection

Root Cause	Signal	Effect	Test detect
Alternator belt breaking	W	Alternator disexcitation	VPH<VPHH & VA+<Vreg
Brushes open	W	Alternator disexcitation	VPH<VPHH & VA+<Vreg
Field interruption	W	Alternator disexcitation	VPH<VPHH & VA+<Vreg
Field short circuit to the battery	W	Alternator disexcitation	VPH<VPHH & VA+<Vreg
Field short circuit to the ground	DF	Overvoltage	DF<VS1 & VA+>Vreg

Figure 4. Load Response Control.

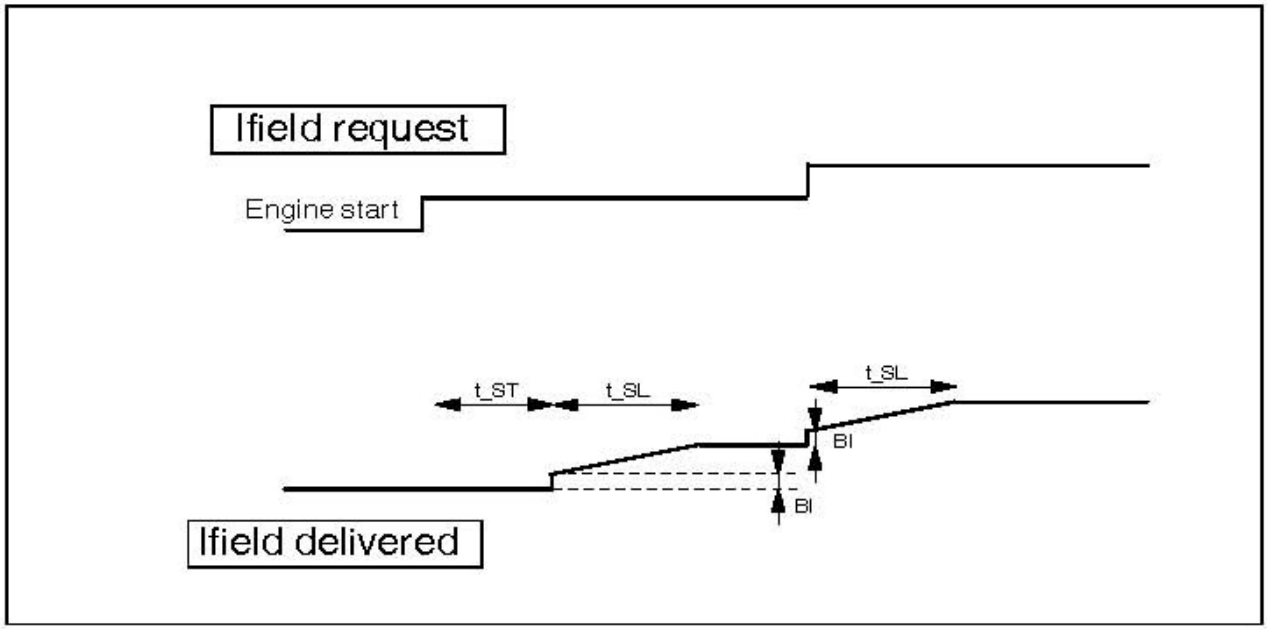
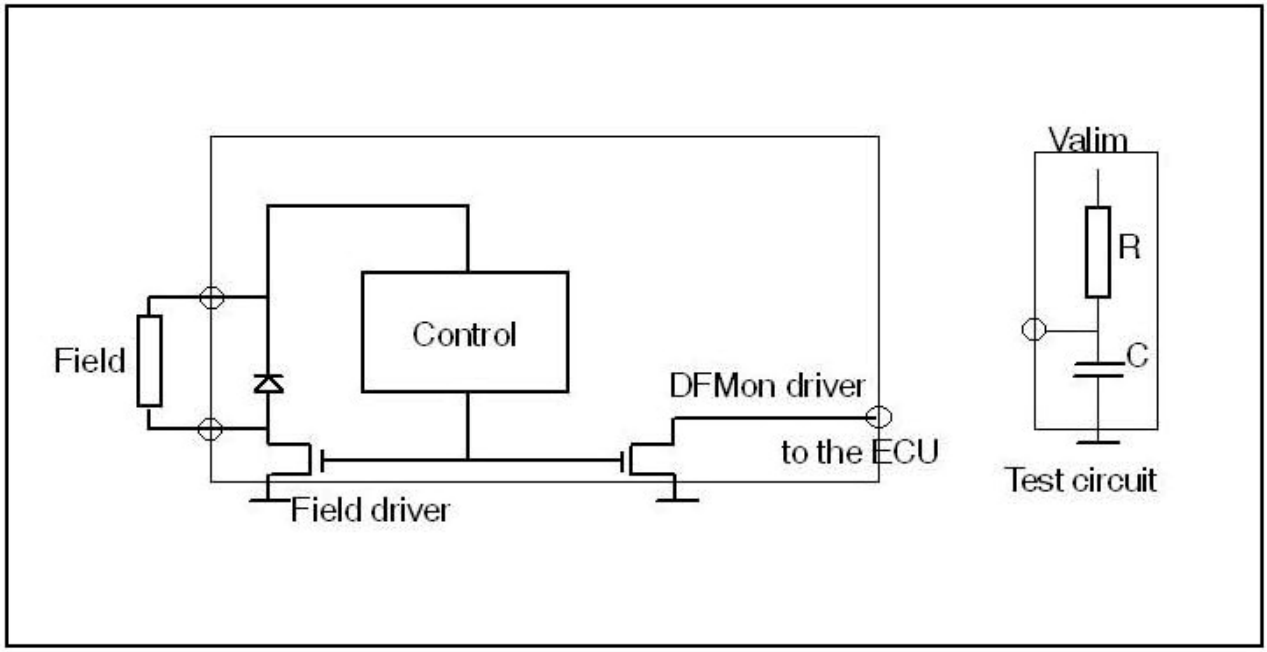
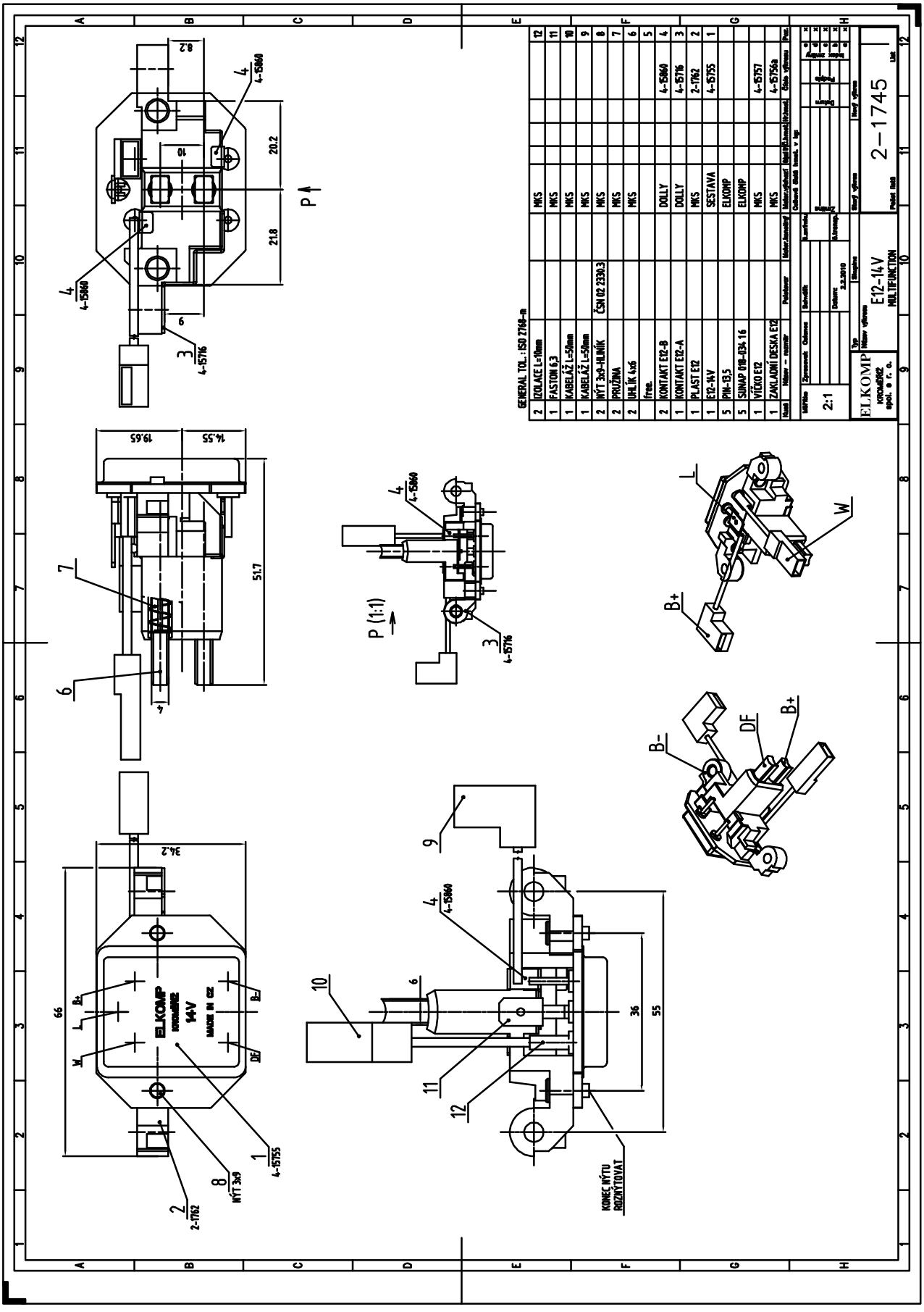


Table 2. L9408 Application Summary Features (standard option)

Regulation Voltage (V)	Thermal Drift (mV/°C)	Pre-exc. FS_DF (%)	Soft Start Delay Timing (s)	Soft Attak Timing (s)	DF Monitor function
14.45	-3	12.5	0	2.88	YES

Figure 5. DF Monitor Electrical configuration




GENERAL TOL.: ISO 2768-m
2 IZOLACE L=10mm MKS
1 FASTON 6,3 MKS
1 KABELÁŽ L=50mm MKS
1 KABELÁŽ L=50mm MKS
2 NÝT 3x9-HLINÍK ČSN 02 2330.3 MKS
2 PRUŽINA MKS
2 UHLÍK 4x6 MKS
Free.
2 KONTAKT E12-B DOLLY 4-5860
1 KONTAKT E12-A DOLLY 4-5716
1 PLAST E12 MKS 2-1762
1 E12-14V SESTAVA 4-5755
5 PIN-13,5 ELKOMP
5 SUNAP 018-1B34.16 ELKOMP
1 VÍČKO E12 MKS 4-5757
1 ZÁKLADNÍ DESKA E12 MKS 4-5756a
ELKOMP
E12-14V
MULTIFUNKTION
2–1745
2:1
P (1:1)
P
B+
B-
DF
W
L
KONEC NÝTU ROZKLEPTOVAT
ELKOMP
14V
MADE IN CZ