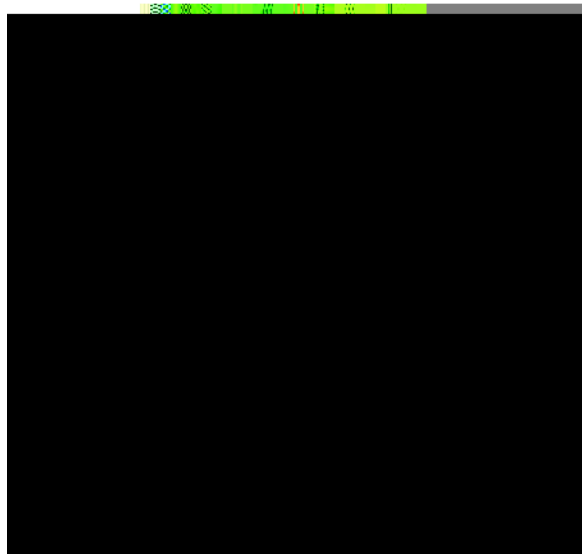




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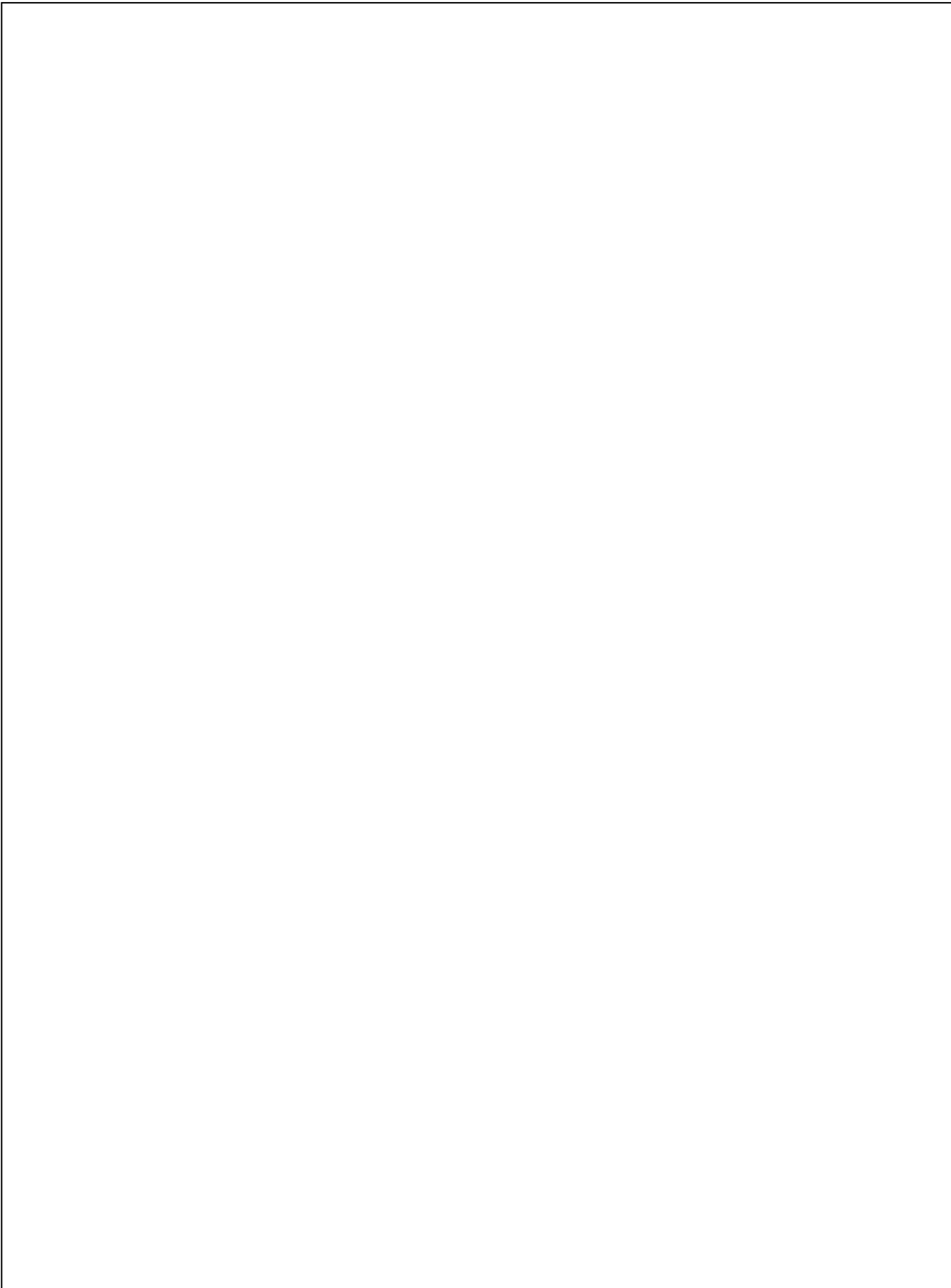
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February 2013

Application Circuit Diagram





Pin Configuration

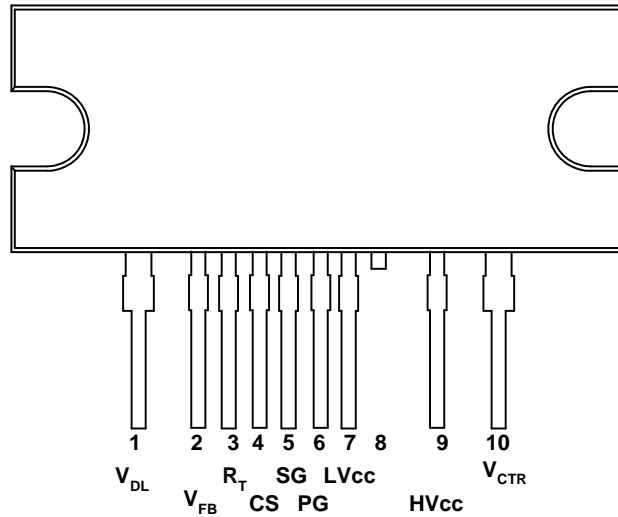


Figure 4. Package Diagram

Pin Definitions

Pin #	Name	Description
1	V_{DL}	This is the drain of the high-side MOSFET, typically connected to the input DC link voltage.
2	V_{FB}	This pin is connected to the inverting input of the PWM comparator internally and to the optocoupler externally. The duty cycle is determined by the voltage on this pin.
3	R_T	

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. $T_A=25^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	Min.	Max.	Unit
V_{DS}	Maximum Drain-to-Source Voltage ($V_{DL}-V_{CTR}$ and V_{CTR-PG})	600		V
LV_{CC}	Low-Side Supply Voltage	-0.3	25.0	V
HV_{CC} to V_{CTR}	High-Side V_{CC} Pin to Low-Side Drain Voltage	-0.3	25.0	V
HV_{CC}	High-Side Floating Supply Voltage	-0.3	625.0	V
V_{FB}	Feedback Pin Input Voltage	-0.3	LV_{CC}	V
V_{CS}	Current Sense (CS) Pin Input Voltage	-5.0	1.0	V
V_{RT}	R_T Pin Input Voltage	-0.3	5.0	V
dV_{CTR}/dt	Allowable Low-Side MOSFET Drain Voltage Slew Rate		50	V/ns
P_D	Total Power Dissipation ⁽³⁾		12.0	W
T_J	Maximum Junction Temperature ⁽⁴⁾		+150	°C
	Recommended Operating Junction Temperature ⁽⁴⁾	-40	+130	
T_{STG}	Storage Temperature Range	-55	+150	°C
MOSFET Section				
V_{DGR}	Drain Gate Voltage ($R_{GS}=1M\Omega$)	600		V
V_{GS}	Gate Source (GND) Voltage		± 30	V
I_{DM}	Drain Current Pulsed		33	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	11	A
		$T_C=100^\circ\text{C}$	7	
Package Section				
Torque	Recommended Screw Torque		5~7	kgf·cm

Notes:

- Per MOSFET when both MOSFETs are conducting.
- The maximum value of the recommended operating junction temperature is limited by thermal shutdown.

Thermal Impedance

$T_A=25^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	Value	Unit
J_C	Junction-to-Case Center Thermal Impedance (Both MOSFETs Conducting)	10.44	°C/W
J_A	Junction-to-Ambient Thermal Impedance	80	°C/W

Electrical Characteristics

$T_A=25^\circ\text{C}$ and $V_{CC}=17\text{ V}$ unless otherwise specified.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
MOSFET Section						
BV_{DSS}	Drain-to-Source Breakdown Voltage	$I_D=200\ \mu\text{A}$, $T_A=25^\circ\text{C}$	600			V
		$I_D=200\ \mu\text{A}$, $T_A=125^\circ\text{C}$		650		
$R_{DS(ON)}$	On-State Resistance	$V_{GS}=10\text{ V}$, $I_D=5.5\text{ A}$		0.32	0.38	Ω
t_{rr}	Body Diode Reverse Recovery Time ⁽⁵⁾	$V_{GS}=0\text{ V}$, $I_{Diode}=11.0\text{ A}$, $dI_{Diode}/dt=100\text{ A}/\mu\text{s}$		120		ns
C_{ISS}	Input Capacitance ⁽⁵⁾	$V_{DS}=25\text{ V}$, $V_{GS}=0\text{ V}$, $f=1.0\text{ MHz}$		1148		pF

Electrical Characteristics (Continued)

$T_A=25^\circ\text{C}$ and $LV_{CC}=17\text{ V}$ unless otherwise specified.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Protection Section						
I_{OLP}	OLP Delay Current	$V_{FB}=5\text{ V}$	3.8	5.0	6.2	μA
V_{OLP}	OLP Protection Voltage	$V_{FB} > 6\text{ V}$	6.3	7.0	7.7	V
V_{OVP}	LV_{CC} Over-Voltage Protection	$LV_{CC} > 21\text{ V}$	21	23	25	V
V_{AOCP}	AOCP Threshold Voltage	$\Delta V/\Delta t=-1\text{ V}/\mu\text{s}$	-1.0	-0.9	-0.8	V
t_{BAO}	AOCP Blanking Time ⁽⁵⁾	$V_{CS} < V_{AOCP};$ $\Delta V/\Delta t=-1\text{ V}/\mu\text{s}$		50		ns
t_{DA}	Delay Time (Low-Side) from V_{AOCP} to Switch Off ⁽⁵⁾	$\Delta V/\Delta t=-1\text{ V}/\mu\text{s}$		250	400	ns
V_{LIM}	Pulse-by-Pulse Current Limit Threshold Voltage	$\Delta V/\Delta t=-0.1\text{ V}/\mu\text{s}$	-0.64	-0.58	-0.52	V
t_{BL}	Pulse-by-Pulse Current Limit Blanking Time	$V_{CS} < V_{LIM};$ $\Delta V/\Delta t=-0.1\text{ V}/\mu\text{s}$		150		ns
t_{DL}	Delay Time (Low-Side) from V_{LIM} to Switch Off ⁽⁵⁾	$\Delta V/\Delta t=-0.1\text{ V}/\mu\text{s}$		450		ns
T_{SD}	Thermal Shutdown Temperature ⁽⁵⁾		110	130	150	$^\circ\text{C}$
I_{SU}	Protection Latch Sustain LV_{CC} Supply Current	$LV_{CC}=7.5\text{ V}$		100	150	μA
V_{PRSET}	Protection Latch Reset LV_{CC} Supply Voltage		5			V
Dead-Time Control Section						
D_T	Dead Time ⁽⁶⁾			200		ns

Notes:

5. This parameter, although guaranteed, is not tested in production.
6. These parameters, although guaranteed, are tested only in EDS (wafer test) process.

Typical Performance Characteristics

These characteristic graphs are normalized at $T_A=25^\circ\text{C}$.



Typical Performance Characteristics (Continued)

These characteristic graphs are normalized at $T_A=25^{\circ}\text{C}$.

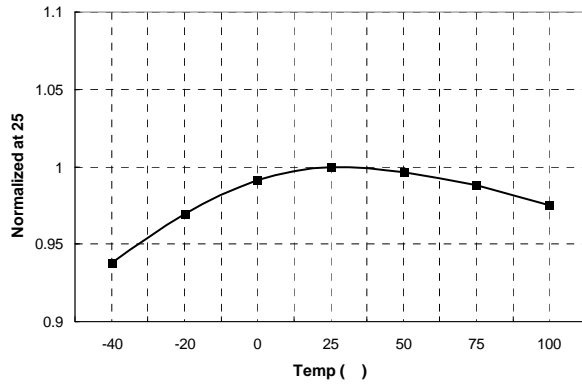


Figure 11. OLP Delay Current vs. Temperature

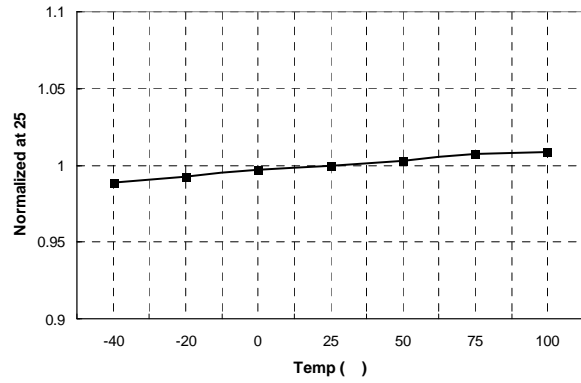


Figure 12. OLP Voltage vs. Temperature

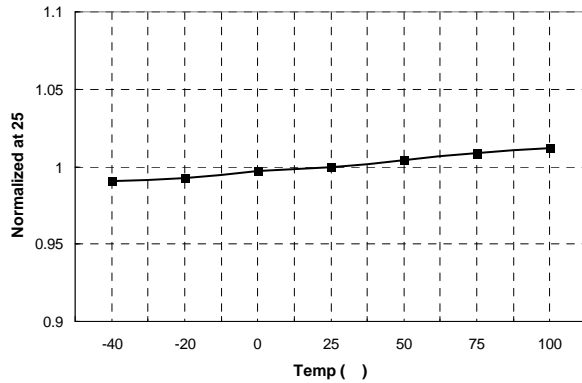


Figure 13. LV_{CC} OVP Voltage vs. Temperature

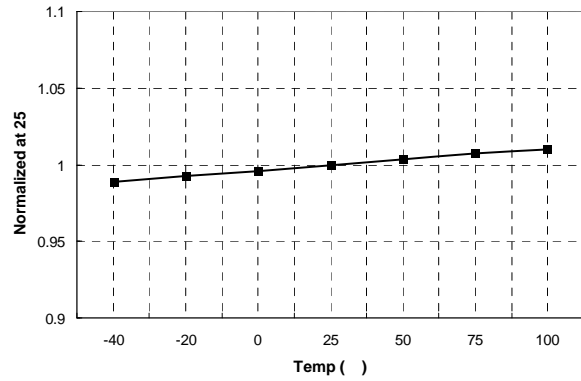


Figure 14. R_T Voltage vs. Temperature

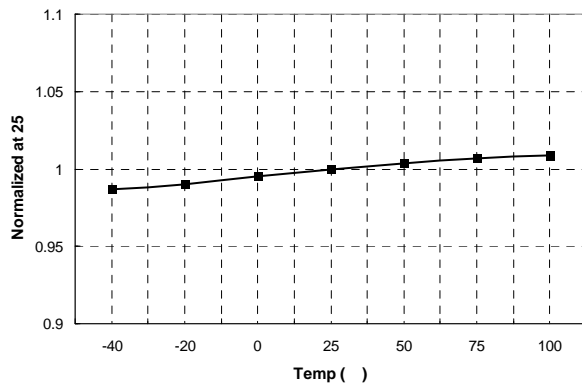


Figure 15. V_{BH} Voltage vs. Temperature

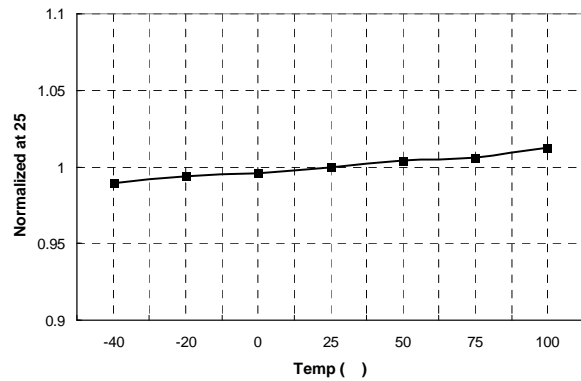
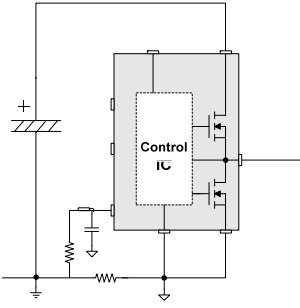
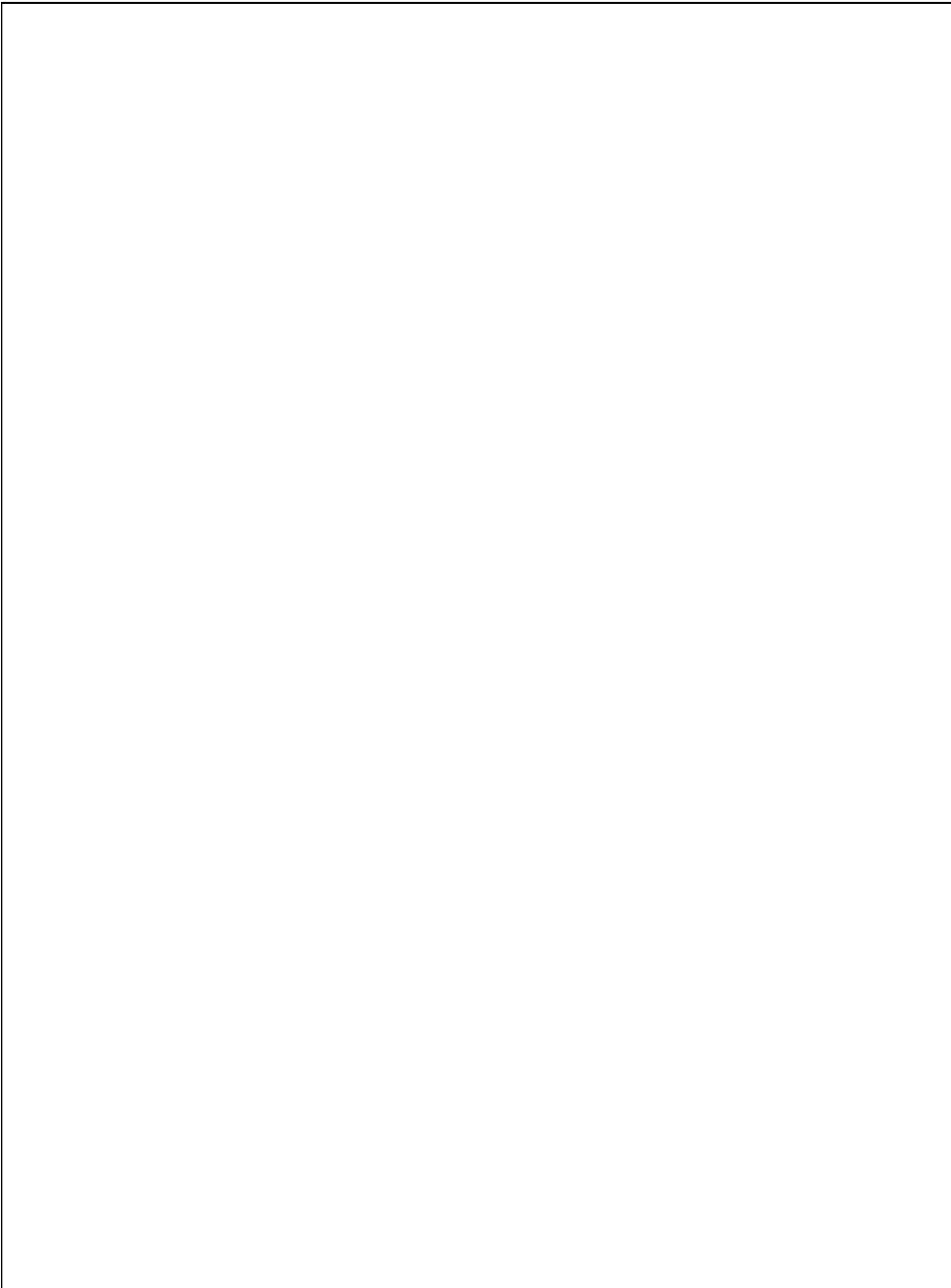


Figure 16. V_{LIM} Voltage vs. Temperature

Functional Description

1. **Internal Oscillator:** FSFA2100 employs a current-





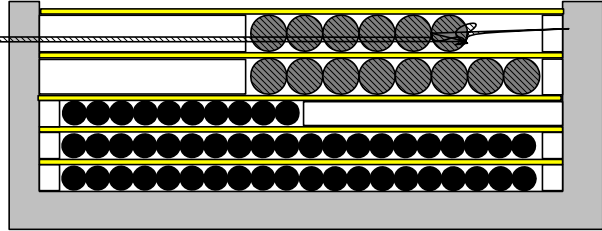
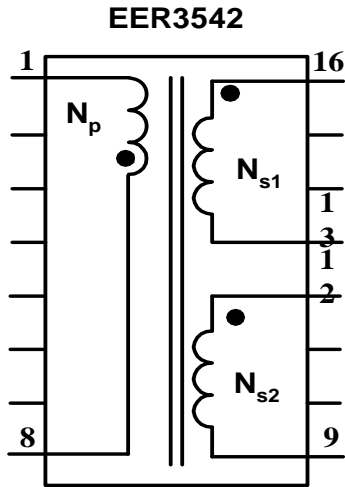
Typical Application Circuit (Asymmetric PWM Half-Bridge Converter)

Application	FPS™ Device	Input Voltage Range	Rated Output Power	Output Voltage (Rated Current)
LCD TV	FSFA2100	400 V	200 W	25 V-8 A

Features


Typical Application Circuit (Continued)

Core: EER3542 ($A_e=107 \text{ mm}^2$)
 Bobbin: EER3542 (Horizontal)



26.20
25.80

23.10
22.90

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