

IGBT, **TO-247-3L**, **1200 V**, **1.67 V**, **40 A**

AFGHL40 120 D-D

Description

Using the novel field stop 7th generation IGBT technology and the Gen7 Diode in TO247 3 lead package, this device offers good performance with low on state voltage and low switching losses for

- Maximum Junction Temperature $T_J = 175^\circ\text{C}$
- Short Circuit Rated and Low Saturation Voltage
- Fast Switching and Tightened Parameter Distribution
- AEC Q101 Qualified, PPAP Available Upon Request
- This Device is Pb Free, Halogen Free/BFR Free and is RoHS Compliant

Applications

- Automotive E compressor / Automotive EV PTC Heater / OBC

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

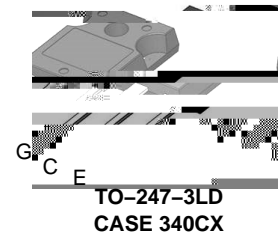
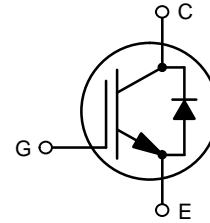
Parameter	Symbol	Value	Unit	
Collector-to-Emitter Voltage	V_{CE}	1200	V	
Gate-to-Emitter Voltage	V_{GE}	± 20	V	
Transient Gate-to-Emitter Voltage		± 30		
Collector Current	I_C	$T_C = 25^\circ\text{C}$	80	A
		$T_C = 100^\circ\text{C}$	40	
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	468	W
		$T_C = 100^\circ\text{C}$	234	
Pulsed Collector Current	I_{CM}	$T_C = 25^\circ\text{C}$, $t_p = 10 \mu\text{s}$ (Note 1)	120	A
Diode Forward Current	I_F	$T_C = 25^\circ\text{C}$	80	A
		$T_C = 100^\circ\text{C}$	40	
Pulsed Diode Maximum Forward Current	I_{FM}	$T_C = 25^\circ\text{C}$, $t_p = 10 \mu\text{s}$ (Note 1)	120	A
Short Circuit Withstand Time $V_{GE} = 15 \text{ V}$, $V_{CC} = 800 \text{ V}$, $T_C = 150^\circ\text{C}$	T_{SC}	6	μs	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +175	$^\circ\text{C}$	
Lead Temperature for Soldering Purposes	T_L	260	$^\circ\text{C}$	

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

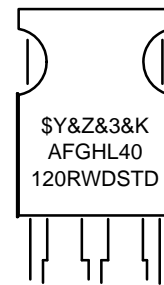
1. Repetitive rating; Pulse width limited by max. junction temperature

BV_{CES}	$V_{CE(sat)}$ TYP	I_C MAX
1200 V	1.67 V	40 A

PIN CONNECTIONS



MARKING DIAGRAM



- \$Y = onsemi Logo
- &Z = Assembly Plant Code
- &3 = 3-Digit Date Code
- &K = 2-Digit Lot Traceability Code
- AFGHL40120RWDSTD = Specific Device code

ORDERING INFORMATION

Device	Package	Shipping
AFGHL40T120RWD-STD	TO-247-3L (Pb-Free)	30 Units / Tube

AFGHL40T120RWD-STD

THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case for IGBT	$R_{\theta JC}$	0.32	°C/W
Thermal Resistance, Junction-to-Case for Diode	$R_{\theta JCD}$	0.59	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-to-Emitter Breakdown Voltage	BV_{CES}	$V_{GE} = 0\text{ V}, I_C = 1\text{ mA}$	1200	-	-	V
Collector-to-Emitter Breakdown Voltage Temperature Coefficient	$\Delta BV_{CES}/\Delta T_J$	$V_{GE} = 0\text{ V}, I_C = 9.99\text{ mA}$	-	1226	-	mV/°C
Zero Gate Voltage Collector Current	I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	-	-	40	μA
Gate-to-Emitter Leakage Current	I_{GES}	$V_{GE} = \pm 20\text{ V}, V_{CE} = 0\text{ V}$	-	-	± 400	nA

ON CHARACTERISTICS

Gate Threshold Voltage	$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 40\text{ mA}$	5.1	6	6.9	V
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE} = 15\text{ V}, I_C = 40\text{ A}, T_J = 25^\circ\text{C}$				

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ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
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SWITCHING CHARACTERISTICS

Turn-On Delay Time

AFGHL40T120RWD-STD

TYPICAL CHARACTERISTICS

Figure 1. Output Characteristics

Figure 2. Output Characteristics

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TYPICAL CHARACTERISTICS

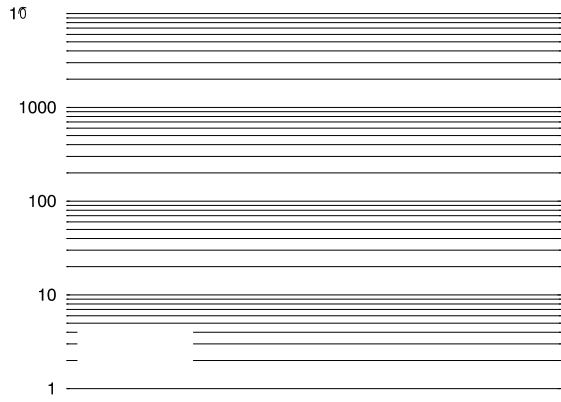
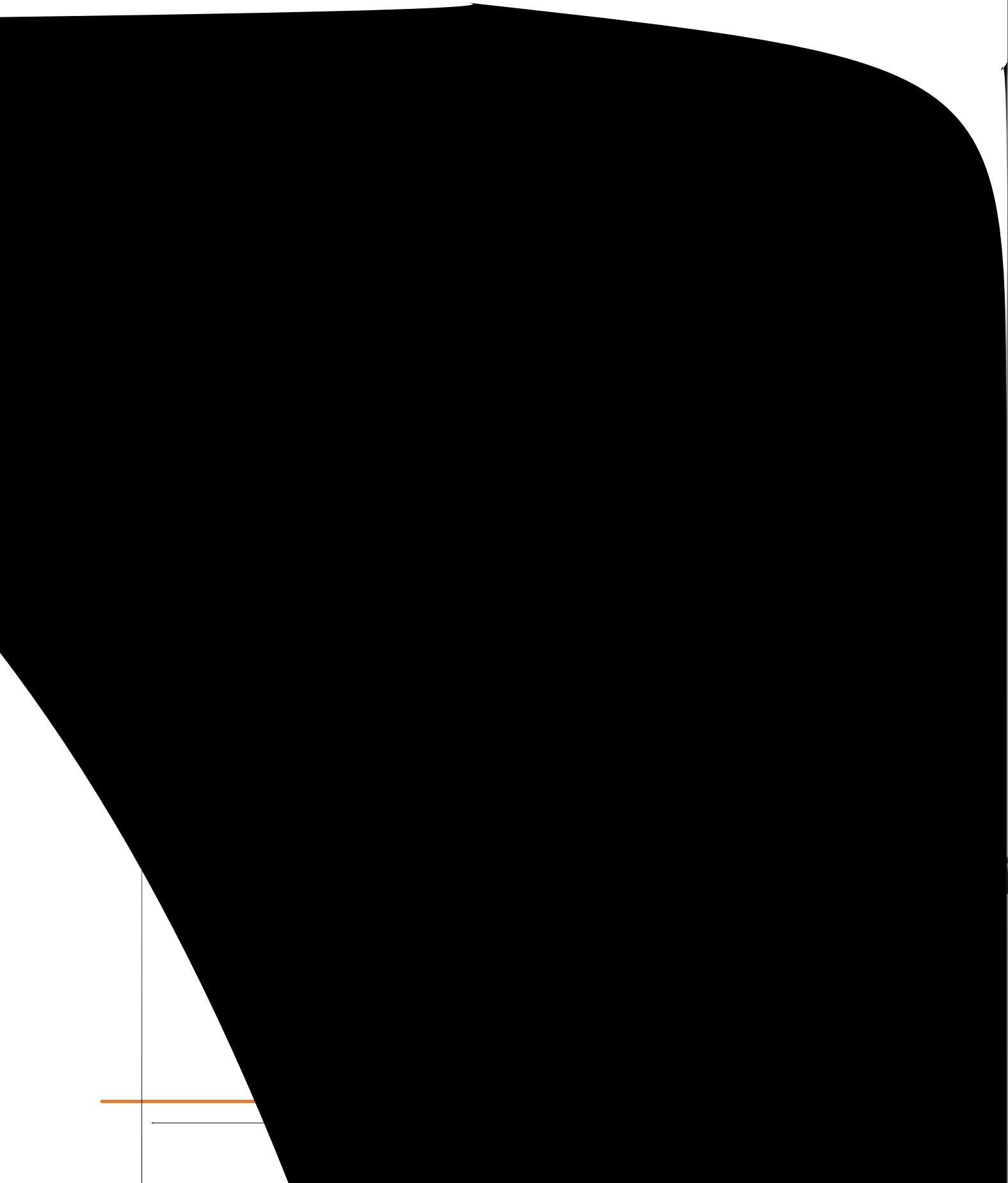


Figure 7. Capacitance Characteristics

Figure 8. Gate Charge Characteristics

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TYPICAL CHARACTERISTICS



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