



## Advanced Electronics Solutions

JEFF TSAO  
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RF Solutions

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# Key Messages

## *Achieving Breakthrough Growth*

***Powerful secular tailwinds*** in the EV, Automotive Radar (ADAS), Aerospace and Defense and Renewable Energy markets

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***Collaborative customer relationships*** that make AES a trusted partner

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***Deep materials, systems and applications expertise*** in high-power and high-frequency designs



# AES Business Overview

## PRODUCT PORTFOLIO

Engineered Materials Solutions in the areas of:

- Power Electronics
- Radio Frequency (RF)

Sales and manufacturing worldwide

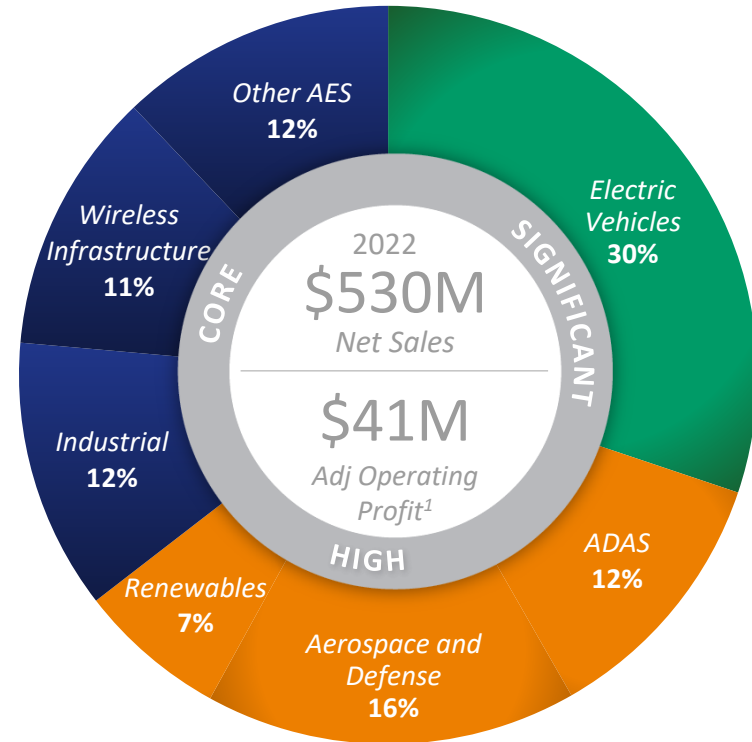
Diversified geographic sales mix:



## AES HIGHLIGHTS

Strong leadership positions across markets

Engineer-to-engineer relationships



**A GLOBAL LEADER IN MATERIALS BASED SOLUTIONS FOR HIGH-POWER AND HIGH-FREQUENCY APPLICATIONS**



# What We Enable - Power Electronics

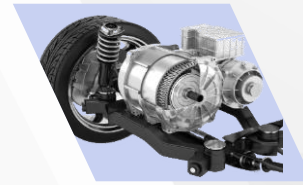
*A market leader in Power Conversion and Power Interconnect Solutions  
Enabling **maximum power efficiency and reliability***



EV Battery



Power Conversion



EV Motor



Wind / Solar Power



Power Interconnect



Electrical Grid

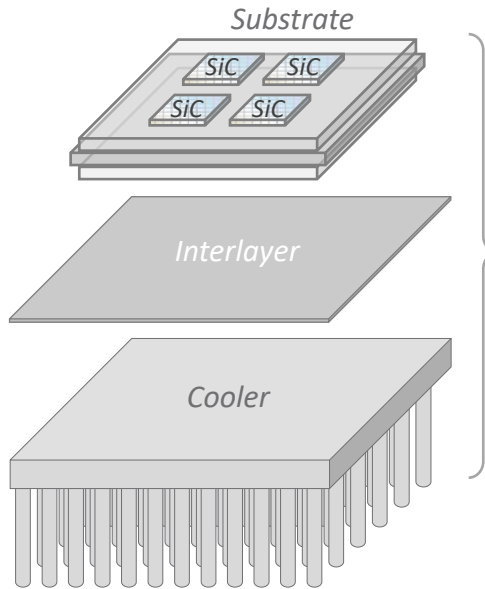




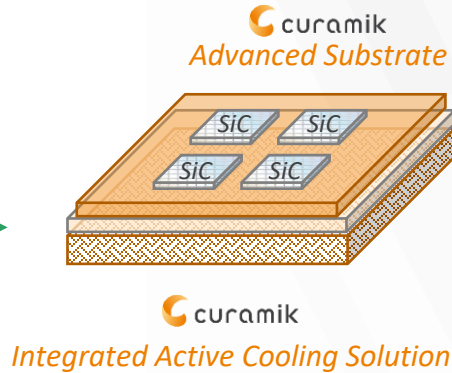
# What We Solve \ EV Power Conversion

Address major challenges – EV Range, Cost, Safety – by extracting heat more efficiently

## TYPICAL APPROACH



## ROGERS APPROACH



**Simple & Compact**

## ROGERS ADVANTAGE

Speed of heat removal 25% ↗

Inverter volume 20% ↘

Copper material content 50% ↘

Inverter system cost 10% ↘



# What We Solve \ EV Power Interconnect

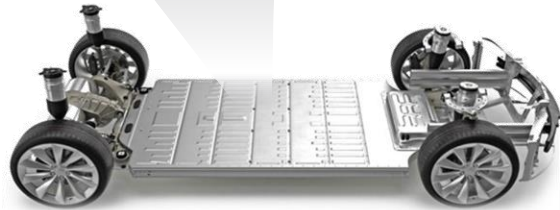
*By efficiently distributing power we lower EV system costs and improve EV range and safety*

## CUSTOMER CHALLENGE

*Connect battery components safely and in a compact space*



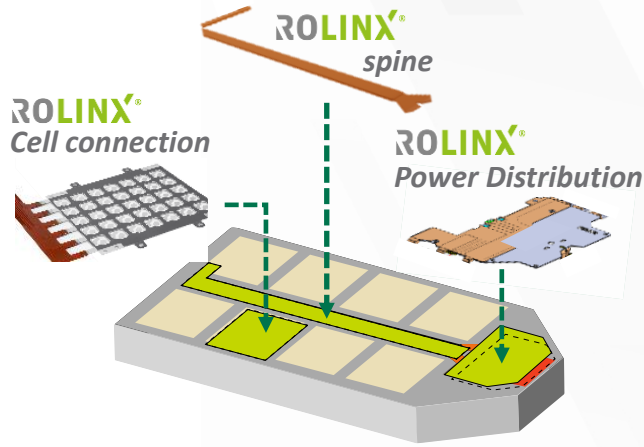
**5,000 to 9,000  
Battery cells**



**EV Skateboard Chassis**

## ROGERS APPROACH

*Custom-design, low-profile, integrated battery management and safety feature*



**Reliable & Compact**

## ROGERS ADVANTAGE

**Reduce battery size by 3-5kWh**  
*(vs. typical battery size 80-100kWh)*

**Reduce battery cost by \$350-600**  
*(vs. typical battery cost \$10-12K)*

**Improved reliability through ease of assembly**

**Integrated design improves safety and battery management**



# Why We Win



*A trusted, proven development partner for power conversion and interconnect*

## CUSTOMER CHALLENGES



*Carbon Footprint  
Reduction by 2030*



*Compressed EV  
Development Cycle*



*Limited EV Power  
Train History*

## ROGERS ADVANTAGES



*Trusted by  
Customers for  
40+ Years*



*Proven  
Reliability  
Leveraging know-how  
to EVs and Renewables*



*Broad  
Portfolio*



*Design for  
Performance*

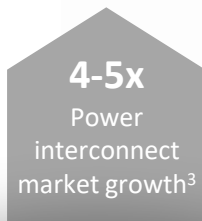
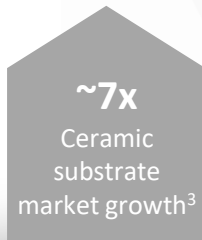
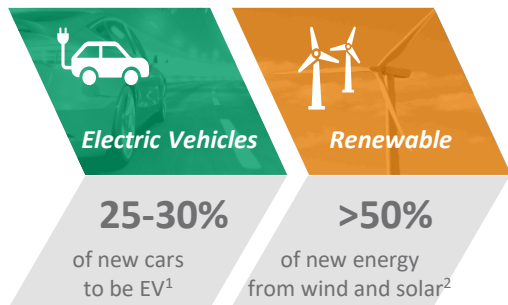


*Design for  
Manufacturing*

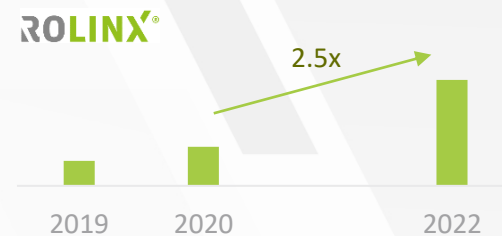
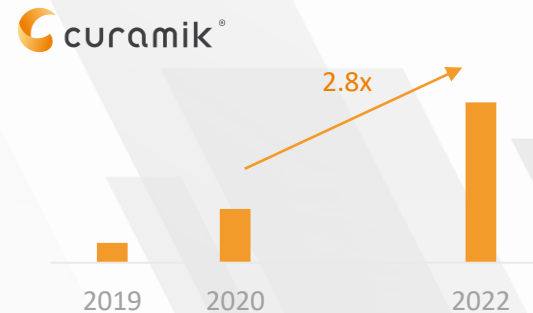
# Growing Markets and Strong Opportunity Funnel

Rogers targeting higher-power applications with growth rate of **~30% CAGR** by 2027

## MARKET MOMENTUM AND REQUIRED INDUSTRY GROWTH TO MEET THE DEMAND



## OPPORTUNITY FUNNEL







# Driving Innovation - Power Electronics

## THREE AVENUES FOR INNOVATION ROADMAP

### Product Innovation

*e.g., integrated thermal solution, battery interconnect*

### Material innovation

*Meeting higher temp and reliability requirements*

### Manufacturing Process

*ensure highest quality and consistency*

## MARKET CHALLENGES ADDRESSED

*Power conversion efficiency*

*Embedded safety in smaller form factor*

*Power distribution efficiency*

*Improved heat dissipation*

## CUSTOMER BENEFITS



**EFFICIENCY  
RELIABILITY  
SAFETY**



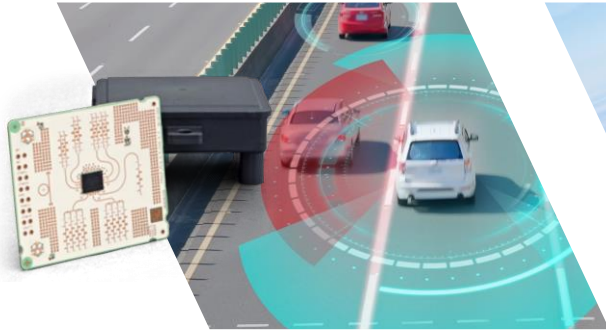
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RF SOLUTIONS

# What We Enable - Radio Frequency Solutions

*Enhance the capability of mission-critical radio frequency systems*



## **Automotive Radar**

*More informed, proactive,  
collision avoidance*



## **Defense Systems**

*Enhanced threat detection,  
classification, and elimination*



## **Critical Communications**

*Decades of high-performance  
and reliability*



# What We Solve - Radio Frequency Solutions

*Optimize system range, resolution, reliability and cost by reducing system losses*

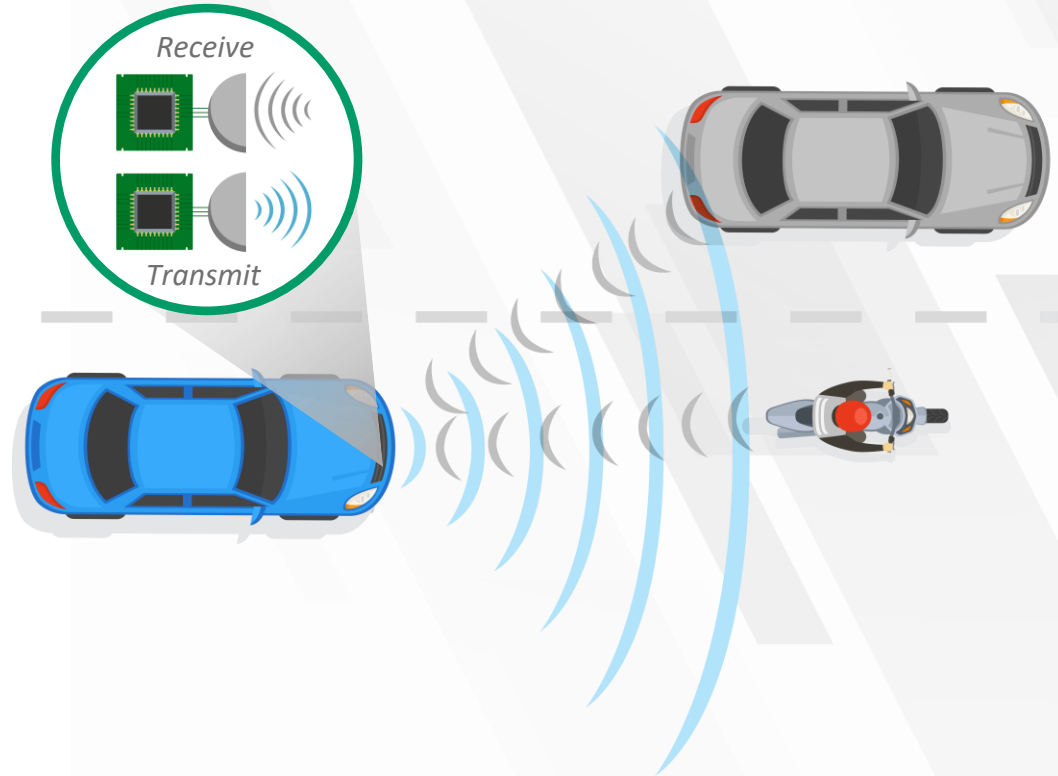
## **ROGERS ADVANTAGE**

*Differentiated low loss dielectric materials – maximize signal strength*

*Improved range and resolution*

*Maximize power efficiency – reduce cost and complexity*

*Proven consistency and reliability across all operating conditions*





# Why We Win - Radio Frequency Solutions

An Industry Leader **trusted** to solve challenges of today and tomorrow



**Trusted by  
Customers for  
60+ Years**

**Strong brand**, with  
long standing  
relationships



**High  
Performance**  
Minimize signal loss

**Decades of  
innovation**, broad  
portfolio of  
solutions for  
breadth of customer  
needs



**Mission-  
Critical  
Reliability**

**Consistent  
performance** - day  
to day, week to  
week... decade to  
decade



**Trusted OEM  
Partnerships**

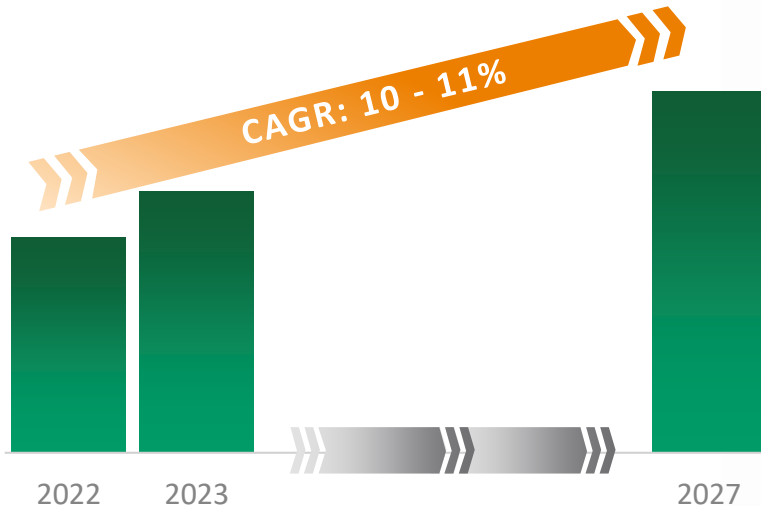
**Deep application  
expertise**, combined with  
**materials leadership**, we  
solve problems before  
competitors identify them



# Automotive Radar (ADAS) Market Opportunity

*Design Win and Opportunity Funnel Supports Growth In Line With Market CAGR*

## AUTOMOTIVE RADAR FORECAST<sup>1</sup>



### **Increased Penetration rate of ADAS systems**

*More cars with radar - 46% to 63%<sup>1</sup>*

*More radars per car - SAE Level 2+ increasing from 29% to 48%<sup>1</sup>*

### **Higher Levels of Autonomy**

*Increased range, field of view, object classification*





# Automotive Radar (ADAS) Market Solutions

## CUSTOMER CHALLENGES

**Reliability and Consistency** – need to work for >10 years under all environmental and road conditions

**Scale** – controlling system cost and complexity as number of sensors increase

**Performance** – need for viable high resolution radar

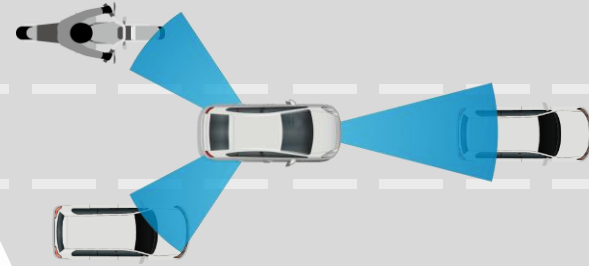
## ROGERS SOLUTIONS

**Trusted Market Leader** - more than 20 years and >500M units of reliable performance

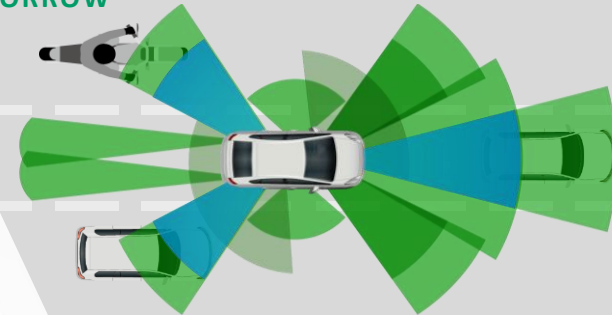
**Broad Portfolio** – cover complete range of cost vs. performance requirements

**Next Generation Antenna Technology** - best in class range, field of view, and object classification at low total cost of ownership

### TODAY



### TOMORROW

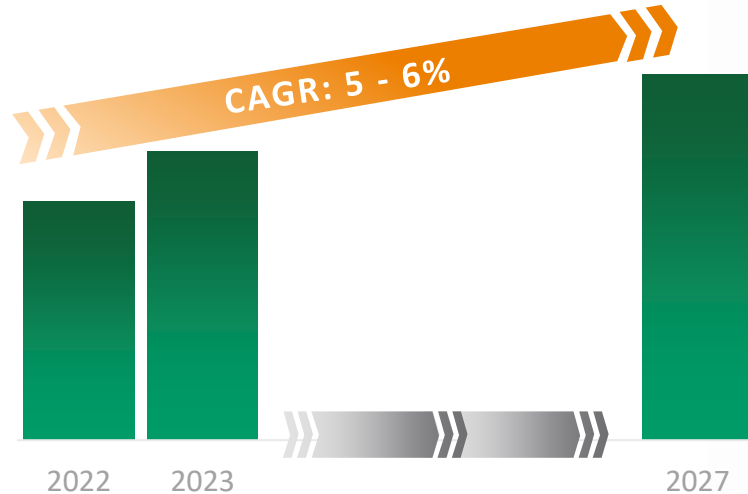




# Aerospace and Defense Market Opportunity

*Design Win and Opportunity Funnel Supports Growth Above Market CAGR*

## DEFENSE ELECTRONICS FORECAST<sup>1</sup>



**Radar and communication systems for advanced threat detection:** enhanced anti-aircraft and missile defense systems

**Improved accuracy and range of munitions:** increasing adoption of on-board guidance systems

**Integrated tactical communication systems:** reliable, real time, communication across and between all land, sea, air and space assets







# Aerospace and Defense Market Solutions

## CUSTOMER CHALLENGES

***Long Life Cycles** – Design, production, and operation over multi-decade platform life – requires reliable supply base*

***Sophisticated Adversaries** – Incoming threats becoming faster and smaller making them harder to detect and eliminate*

***RF Everywhere** - Communications becoming increasingly mobile, on asset, driving strong need for miniaturization*

***Trusted Market Leader** with more than six decades of providing leading edge solutions*

***Consistency and Stability** of performance in extreme environmental conditions*

***Unique Solutions for Miniaturization** with high barriers to entry*

## ROGERS SOLUTIONS





# Innovation Pipeline Highlights

## AEROSPACE & DEFENSE

**Antenna Miniaturization** enabling robust communication links to be deployed “on asset” – operational testing has demonstrated 75% reduction in antenna footprint and improved performance



## ADAS

**Next Generation Antennas for Automotive Radar**  
Delivers cost and performance requirements for the next levels of autonomous driving – 40% increase in range, ability to detect object 85% smaller at same range (car vs. a motorbike), 20% lower total cost of ownership



## EV/HEV CHARGING

**Laminates and Assemblies** to enable faster, more convenient, and reliable wireless charging – 75% reduction in coil size for same performance – benefits for on car installation





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***Deep materials, systems and applications expertise*** in high-power and high-frequency designs





# Appendix



# Non-GAAP Information

## Non-GAAP Information

This presentation includes the following historical financial measures that are not presented in accordance with generally accepted accounting principles in the United States of America ("GAAP"):

- (1) Adjusted operating margin, which the Company defines as operating income excluding acquisition-related amortization of intangible assets and discrete items, which are acquisition and related integration costs, gains or losses on the sale or disposal of property, plant and equipment, restructuring, severance, impairment and other related costs, UTIS fire and recovery charges, (income) costs associated with terminated merger (collectively, "discrete items"), divided by total net sales;
- (2) Adjusted EBITDA margin, which the Company defines as net income excluding interest expense, net, income tax expense, depreciation and amortization, stock-based compensation expense, pension settlement charges and discrete items, divided by total net sales;
- (3) Adjusted earnings per diluted share, which the Company defines as earnings per diluted share excluding amortization of acquisition intangible assets, pension settlement charges, discrete items and the related income tax effect on these items, divided by adjusted weighted average shares outstanding - diluted; and
- (4) Free Cash Flow, which the Company defines as net cash provided by operating activities less non-acquisition capital expenditures.

Management believes adjusted operating margin, adjusted EBITDA margin and adjusted earnings per diluted share are useful to investors because they allow for comparison to the Company's performance in prior periods without the effect of items that, by their nature, tend to obscure the Company's core operating results due to potential variability across periods based on the timing, frequency and magnitude of such items. As a result, management believes that these measures enhance the ability of investors to analyze trends in the Company's business and evaluate the Company's performance relative to peer companies. Management also believes free cash flow is useful to investors as an additional way of viewing the Company's liquidity and provides a more complete understanding of factors and trends affecting the Company's cash flows. However, non-GAAP financial measures have limitations as analytical tools and should not be considered in isolation from, or as alternatives to, financial measures prepared in accordance with GAAP. In addition, these non-GAAP financial measures may differ from, and should not be compared to, similarly named measures used by other companies. Reconciliations of the differences between these non-GAAP financial measures and their most directly comparable financial measures calculated in accordance with GAAP are set forth below.

This presentation also contains forward looking non-GAAP financial measures that are adjusted for certain special items. We are not able to reconcile forward-looking non-GAAP Adjusted Operating Margin, Adjusted EBITDA Margin, Adjusted Earnings per Share and Free Cash Flow to the closest corresponding GAAP measures without unreasonable efforts, because we are unable to forecast certain items required to develop meaningful comparable GAAP financial measures.

## FY2022: Segment adjusted operating income and operating margin reconciliation

(\$ in millions)	EMS		AES	
	2022 (\$)	2022 (%)	2022 (\$)	2022 (%)
Operating income and operating margin	\$61.7	14.7%	\$80.9	15.3%
Restructuring, severance, impairment & other related costs	\$26.3	6.3%	\$45.1	8.5%
Acquisition and related integration costs	\$0.8	0.2%	\$0.0	0.0%
Gain on sale of disposal of property, plant and equipment	\$0.0	0.0%	\$0.4	0.1%
UTIS Fire	(\$2.5)	(0.6%)	\$0.1	0.0%
(Income) costs associated with terminated merger	(\$32.9)	(7.8%)	(\$87.5)	(16.5%)
Dispositions	\$3.2	0.8%	-	-
Asbestos-related charges	\$0.0	0.0%	\$0.0	0.0%
Operating income and operating margin, adjusted for discrete items	\$56.7	13.5%	\$39.1	7.4%
Acquisition intangible amortization	\$14.1	3.3%	\$2.3	0.4%
Adjusted operating income and operating margin	\$70.8	16.9%	\$41.4	7.8%