C3M0065090J
Transition Guide

Wolfspeed SEPTEMBER 2024

900/1000V → 1200V TRANSITION

- Transitioning to 1200V class devices provides:
  - Increased $R_{DS(ON)}$ options
  - Increased package options
  - Improved availability and lead times
  - Broader range of applications supported
  - Increased scalability across power levels
- Comparable 1200V products offer potential drop-in solutions for existing designs

SUGGESTED REPLACEMENT OPTION 1

	C3M0065090J	C3M0075120J	Notes
Status	NRND	Active	1200V device already qualified for production on 200mm
$V_{DS\ max}$ (V)	900	1200	Increased voltage headroom
V_{GS} (V)	-4/15	-4/+15	Compatible gate drive levels
I_D (A)	35	30	
$R_{DS(ON)}$ (mΩ)	65	75	Increased conduction losses
C_{oss} (pF)	66	58	Reduced output capacitance improves switching speed
C_{iss}/C_{rss}	152	695	Reduced impact of miller capacitance
Q_G (nC)	30	48	Increased gate power requirement
$R_{G(int)}$ (Ω)	3.5	9	Higher internal R_G may require reduced $R_{G(EXT)}$ in gate drive circuit
$R_{\theta JC}$ (C/W)	1.1	1.1	
Package	TO-263-7	TO-263-7	Fully Compatible
Pricing			Improved price

This replacement option is ideal for most designs

All parameters are typical values at 25 °C unless noted

SUGGESTED REPLACEMENT OPTION 2: CONDUCTION LOSS DOMINATED DESIGNS

	C3M0065090J	C3M0040120J2/1	Notes
Status	NRND	Active	1200V device already qualified for production on 200mm
$V_{DS\ max}$ (V)	900	1200	Increased voltage headroom
V_{GS} (V)	-4/15	-4/+15	Compatible gate drive levels
I_D (A)	35	63	
$R_{DS(ON)}$ (mΩ)	65	40	Reduced conduction loss
C_{oss} (pF)	66	100	
C_{iss}/C_{rss}	152	454	Reduced impact of miller capacitance
Q_G (nC)	30	91	Increased gate power requirement
$R_{G(int)}$ (Ω)	3.5	1.9	
$R_{\theta JC}$ (C/W)	1.1	0.39	Improved thermal impedance
Package	TO-263-7	TO-263-7 XL	Slightly different footprint. See following slide for details.
Pricing		↘	Improved price

This replacement option may be used to achieve higher efficiency or more thermal margin if needed

All parameters are typical values at 25 °C unless noted

COMPARISON OF DIMENSIONS OF J, J1 AND J2 (TO-263-7)

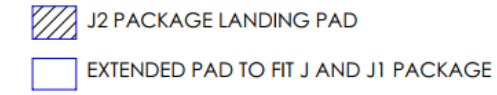
- The J2 package utilizes a more industry standard footprint and takes less PCB space
- Depending on the existing footprint in the PCB layout, small changes may be needed to provide optimal pad sizing for soldering

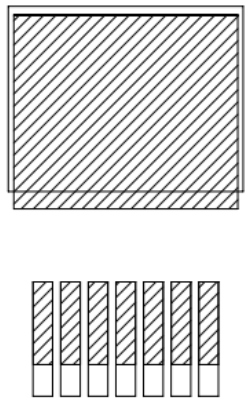
Item All dimensions in mm	WS-J	WS-J1	WS-J2
Device Length	16.178	16.178	15.07
Device Width	10.18	10.18	10
Device Height	4.435	4.435	4.5
Drain Pad Length - Device	6.218	8.018	7.78
Contact Pin Length - Device	2.512	2.7	2.7
Creepage on Device	6.87	4.83	4.65
Creepage on Board (Based on Recommended Landing Pad)	6.99	4.15	4.15
Drain Solder Pad Length - PCB	6.538	8.0	8.5
Drain Solder Pad Width - PCB	10.480	10.8	10.8
Contact Pin Solder Pad Length - PCB	3.4	4.7	5.25*
Contact Pin Solder Pad Width - PCB	0.9	0.8	0.9

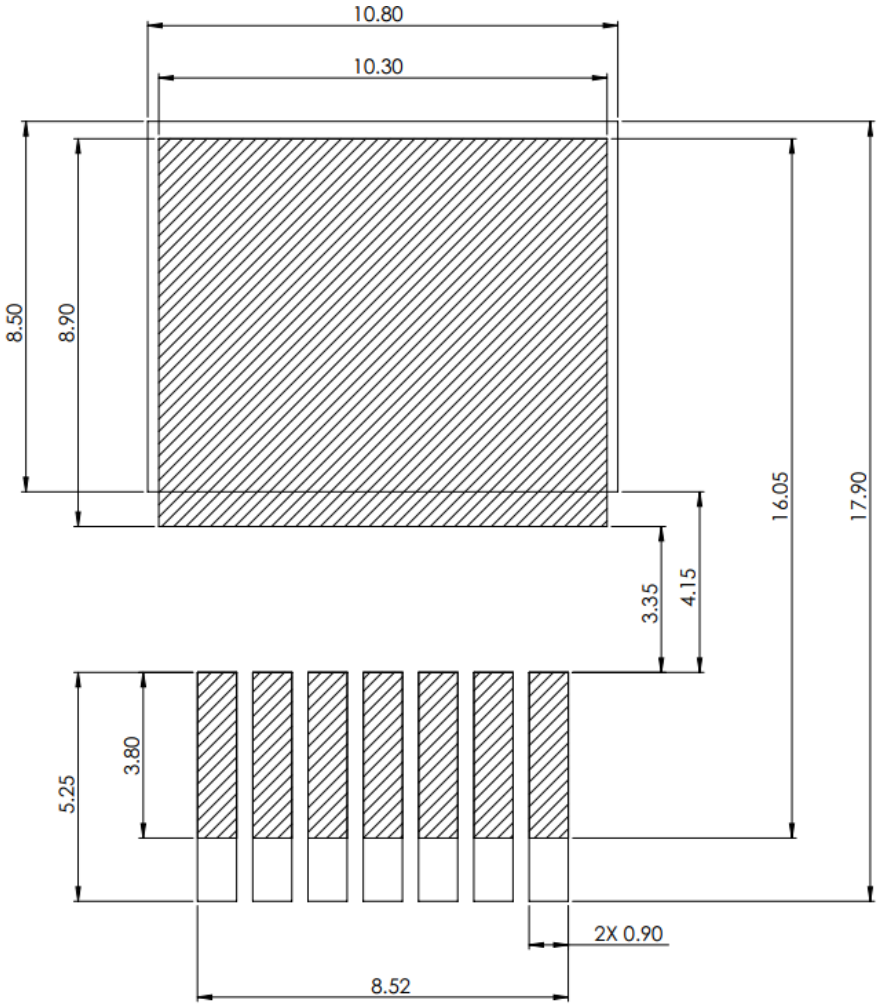
*Note: Considered extended pad for the comparison

J2 RECOMMENDED LANDING PAD

The footprint shown here includes a variant with extended pad sizes that will accommodate the J, J1, and J2 package for maximum flexibility







NOTE: J2 LANDING PAD WAS DESIGNED FOLLOWING IPC 7351 GUIDELINES

NEXT STEPS

- Samples of recommended replacements available through your Wolfspeed sales team, or at our online Sample Center
- Ask any technical questions to your Wolfspeed FAE or through our Power Applications Forum
- Utilize SpeedFit™ to simulate the performance of the recommended replacement devices
  - Keep in mind, dynamic behavior may be different, requiring a different gate resistor value
- The SpeedVal™ Kit evaluation platform may be utilized to compare the performance and switching behavior

THANK YOU