

CDMS24718-120
SILICON CARBIDE
N-CHANNEL MOSFET



www.centrasemi.com



TO-247 CASE

DESCRIPTION:

The CENTRAL SEMICONDUCTOR CDMS24718-120 is an N-channel silicon carbide MOSFET designed for high speed switching and fast reverse recovery applications.

MARKING: CDMS247
18-120

MAXIMUM RATINGS: ($T_J=25^\circ\text{C}$)

Drain-Source Voltage	
Gate-Source Voltage	
Continuous Drain Current ($T_C=25^\circ\text{C}$, $T_J=175^\circ\text{C}$)	
Continuous Drain Current ($T_C=100^\circ\text{C}$, $T_J=175^\circ\text{C}$)	
Pulsed Drain Current ($T_C=25^\circ\text{C}$)	
Operating and Storage Junction Temperature	
Power Dissipation	

SYMBOL		UNITS
V_{DS}	1200	V
V_{GS}	-10 to +25	V
I_D	119	A
I_D	86	A
I_{DM}	250	A
T_J, T_{stg}	-55 to +175	$^\circ\text{C}$
P_D	28	W

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

SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
BV_{DSS}	$I_D=1\text{mA}$	1200			V
I_{DSS}	$V_{DS}=1200\text{V}$, $V_{GS}=0\text{V}$		0.1	1.0	μA
I_{DSS}	$V_{DS}=1200\text{V}$, $V_{GS}=0\text{V}$, $T_J=175^\circ\text{C}$		1.0		μA
I_{GSSF}	$V_{GS}=20\text{V}$, $V_{DS}=0\text{V}$		10	100	nA
I_{GSSR}	$V_{GS}=-5\text{V}$, $V_{DS}=0\text{V}$		10	100	nA
$V_{GS(th)}$	$V_{GS}=V_{DS}$, $I_D=20\text{mA}$	1.8	2.5	4.0	V
$r_{DS(ON)}$	$V_{GS}=20\text{V}$, $I_D=50\text{A}$		18.0	28	$\text{m}\Omega$
$r_{DS(ON)}$	$V_{GS}=20\text{V}$, $I_D=25\text{A}$		17.6	26	$\text{m}\Omega$
$r_{DS(ON)}$	$V_{GS}=20\text{V}$, $I_D=50\text{A}$, $T_J=175^\circ\text{C}$		35		$\text{m}\Omega$
g_{fs}	$V_{DS}=20\text{V}$, $I_D=50\text{A}$		26		S
R_G	$V_{AC}=25\text{mV}$, $f=1\text{MHz}$		0.8		Ω

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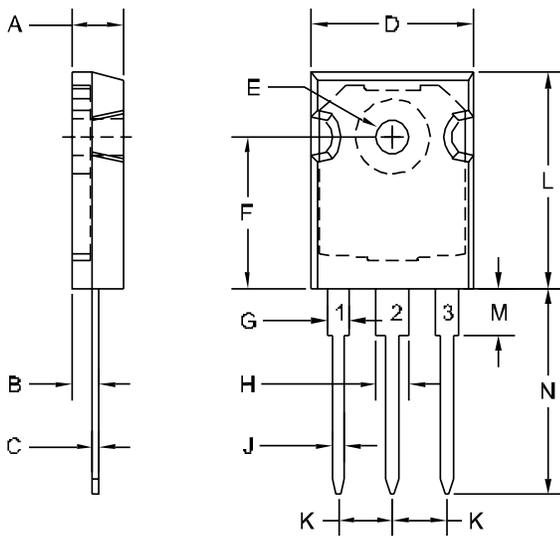
ELECTRICAL CHARACTERISTICS: ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
C_{iss}	$V_{DS}=1\text{kV}, V_{GS}=0, f=200\text{kHz}, V_{AC}=25\text{mV}$		5584		pF
C_{oss}	$V_{DS}=1\text{kV}, V_{GS}=0, f=200\text{kHz}, V_{AC}=25\text{mV}$		261		pF
C_{rss}	$V_{DS}=1\text{kV}, V_{GS}=0, f=200\text{kHz}, V_{AC}=25\text{mV}$		16		pF
E_{oss}	$V_{DS}=1\text{kV}, V_{GS}=0, f=200\text{kHz}, V_{AC}=25\text{mV}$		154		μJ
Q_G	$V_{DD}=800\text{V}, I_{DS}=50\text{A}, V_{GS}=-5$ to $+20\text{V}$		216		nC
Q_{GS}	$V_{DD}=800\text{V}, I_{DS}=50\text{A}, V_{GS}=-5$ to $+20\text{V}$		74		nC
Q_{GD}	$V_{DD}=800\text{V}, I_{DS}=50\text{A}, V_{GS}=-5$ to $+20\text{V}$		36		nC
I_S	$V_{GS}=-5\text{V}, T_C=25^{\circ}\text{C}$			131	A
V_{SD}	$V_{GS}=-5\text{V}, I_S=25\text{A}$		3.6		V
t_{RR}	$I_S=50\text{A}, V_R=800\text{V}, V_{GS}=-5\text{V}, di_f/d_t=14.3\text{A/ns}$		12		ns
Q_{RR}	$I_S=50\text{A}, V_R=800\text{V}, V_{GS}=-5\text{V}, di_f/d_t=14.3\text{A/ns}$		761		nC
I_{RRM}	$I_S=50\text{A}, V_R=800\text{V}, V_{GS}=-5\text{V}, di_f/d_t=14.3\text{A/ns}$		95		A

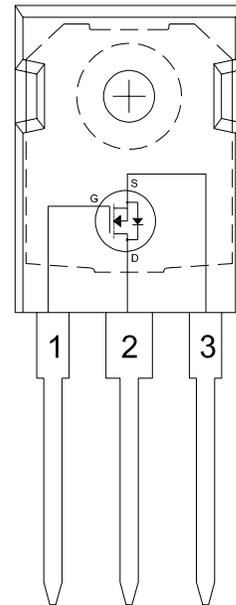
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 N-CHANNEL MOSFET



TO-247 CASE - MECHANICAL OUTLINE



R3



LEAD CODE:

- 1) Gate
- 2) Drain
- 3) Source

MARKING:

CDMS247
18-120

SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.184	0.211	4.68	5.36
B	0.087	0.110	2.20	2.80
C	0.019	0.028	0.48	0.70
D	0.606	0.638	15.38	16.20
E (DIA)	0.128	0.144	3.25	3.65
F	0.583	0.607	14.81	15.42
G	0.072	0.097	1.82	2.46
H	0.115	0.127	2.92	3.23
J	0.035	0.060	0.89	1.53
K	0.207	0.223	5.26	5.66
L	0.812	0.881	20.63	22.38
M	0.145	0.177	3.68	4.50
N	0.728	0.846	18.50	21.50

TO-247 (REV: R3)

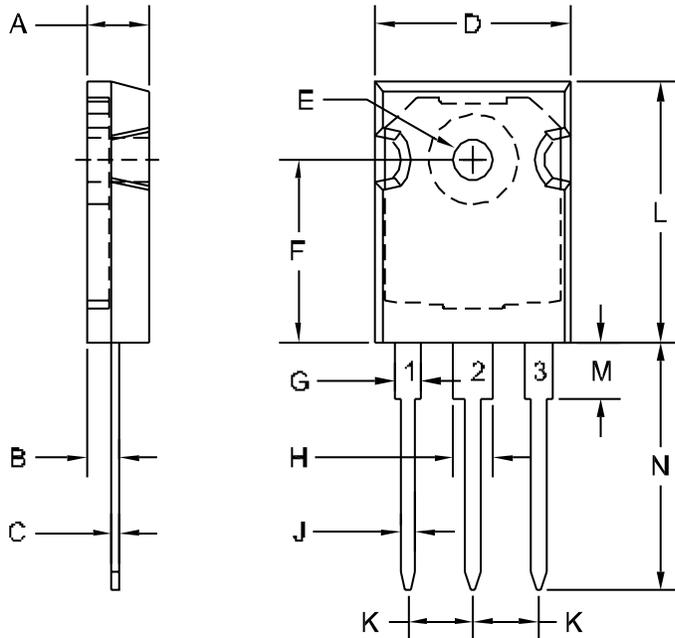
R1 (06-August 2024)

Package Details

TO-247 Case



Mechanical Drawing



SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.184	0.211	4.68	5.36
B	0.087	0.110	2.20	2.80
C	0.019	0.028	0.48	0.70
D	0.606	0.638	15.38	16.20
E (DIA)	0.128	0.144	3.25	3.65
F	0.583	0.607	14.81	15.42
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K	0.207	0.223	5.26	5.66
L	0.812	0.881	20.63	22.38
M	0.145	0.177	3.68	4.50
N	0.728	0.846	18.50	21.50

TO-247 (REV: R3)

R3

Lead Code:

Reference individual device datasheet.

Packing Options

Bulk:

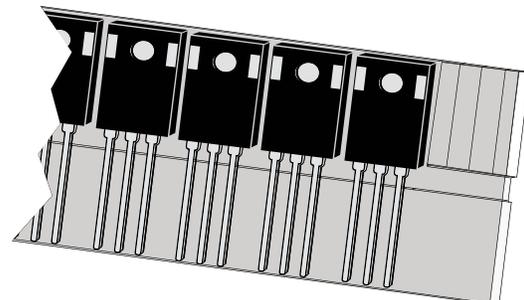
White corrugated box with static shielded bags

Bulk Packing Quantity: 100

Sleeve:

Antistatic coated plastic sleeve (surface resistivity of $>10^9$ and $<10^{13}$ ohms per square)

Sleeve Packing Quantity: 30



TO-247 Antistatic Sleeve

R1 (22-February 2023)

Material Composition Specification

TO-247 Case



Device average mass **6.175 g**
 Fluctuation margin **+/-10%**

Component	Material	Material		Substance	CAS #	Substance		
		% wt	mg			% wt	mg	ppm
active device	doped Si	0.11%	7.100	Si	7440-21-3	0.11%	7.100	1,150
die attach	high temperature solder	0.23%	14.320	Pb	7439-92-1	0.21%	13.25	2,145
				Ag	7440-22-4	0.01%	0.36	58
				Sn	7440-31-5	0.01%	0.716	116
bond wire	Aluminum	0.23%	14.220	Al	7440-57-5	0.23%	14.220	2,303
leadframe	Cu alloy	64.79%	4000.65	Cu	7440-50-8	64.66%	3993.050	646,648
				Fe	7439-89-6	0.10%	6.000	972
				P	7723-14-0	0.03%	1.600	259
encapsulation	EMC	33.59%	2074.21	silica	7631-86-9	26.15%	1614.50	261,457
				epoxy resin	29690-82-2	3.38%	208.85	33,821
				phenol resin	9003-35-4	3.05%	188.385	30,508
				carbon black	1333-86-4	0.10%	5.887	953
				Sb ₂ O ₃	1309-64-4	0.73%	45.359	7,346
				TBBA	79-94-7	0.18%	11.234	1,819
leadframe plating *	tin lead process	1.04%	64.50	Sn	7440-31-5	0.83%	51.500	8,340
				Pb	7439-92-1	0.21%	13.000	2,105
	matte tin	5.18%	64.50	Sn	7440-31-5	1.04%	64.50	10,445

*For Lead Free plating, add suffix "PB FREE" to part number.
 For Tin/Lead plating, add suffix "TIN/LEAD" to part number.
 No suffix designation allows for the supply of either lead-free or tin/lead plated product depending on availability.

Disclaimer
 The information provided in this Material Composition data sheet is, to the best of our knowledge, correct. However, there is no guarantee to completeness or accuracy, as some information is derived from data sources outside the company.

Material Composition Specification

TO-247 Case



Device average mass **6.240 g**
 Fluctuation margin **+/-10%**

Component	Material	Material		Substance	CAS #	Substance		
		% wt	mg			% wt	mg	ppm
active device	doped Si	0.31%	19.20	Si	7440-21-3	0.31%	19.20	3,077
die attach	high temperature solder	10.35%	646.02	Pb	7439-92-1	9.11%	568.50	91,106
				Ag	7440-22-4	1.04%	64.60	10,353
				Sn	7440-31-5	0.21%	12.92	2,071
bond wire	Aluminum	0.22%	13.85	Al	7440-57-5	0.22%	13.85	2,220
leadframe	Cu alloy	54.14%	3378.37	Cu	7440-50-8	54.06%	3373.30	540,593
				Fe	7439-89-6	0.08%	5.07	813
encapsulation*	EMC GREEN	34.56%	2156.76	silica	7631-86-9	22.81%	1423.46	228,119
				Si-oxide Quartz	14808-60-7	6.91%	431.34	69,125
				Phenol-formaldehyde polymer	9003-35-4	3.46%	215.68	34,564
				3-Trimethoxysilylpropane1-thiol	4420-74-0	0.35%	21.57	3,457
				Triphenylphosphine	39319-11-4	0.35%	21.57	3,457
				Ethene, homopolymer	9002-88-4	0.35%	21.57	3,457
				carbon black	1333-86-4	0.35%	21.57	3,457
leadframe plating	matte tin	0.41%	25.80	Sn	7440-31-5	0.41%	25.80	4,135

*EMC GREEN molding compound is Halogen-Free.

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OUTSTANDING SUPPORT AND SUPERIOR SERVICES



PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2nd day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix "TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix "PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

CONTACT US

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