

ENGINEERING PRACTICES STUDY

TITLE: TO SURVEY MILITARY AND INDUSTRY ON IMPROVING AND/OR
STANDARDIZING THE REQUIREMENTS FOR EXISTING DLA LAND AND MARITIME
DRAWINGS FOR CURRENT SENSE RESISTORS AND ASSESS THE INTEREST IN
DEVELOPING A NEW MIL-PRF SPECIFICATION FOR CERTAIN TYPES OF
CURRENT SENSE RESISTORS.

6 October 2021

STUDY PROJECT (SEE ATTACHMENT 1)

FINAL

Study Conducted by DLA LAND AND MARITIME

Prepared by:

Andrew Ernst



I. OBJECTIVES: DLA Land and Maritime-VAT conducted a survey on current sense resistors that are presently available via DLA Land and Maritime drawings. The purpose of this survey was to obtain input from the manufacturers, military services, and user communities to determine if any of the DLA Land and Maritime drawings should be amended to provide a more standardized set of MIL-PRF resistor reference specifications for testing requirements. The survey was also used to determine if there is sufficient interest in developing a MIL-PRF type specifications for any of the available current sense resistor technologies.

II. BACKGROUND: There are 18 DLA Land and Maritime drawings (see **Attachment 1**) that cover different types of current sense resistors. Several different technologies are used (e.g., metal strip, metal foil) in the production of these current sense resistors and therefore, different MIL-PRF resistor specifications references have been cited to define testing requirements. However, one of the manufacturers noticed that their part and one of the other manufacturer's parts of nearly identical construction are each described by different DLA Land and Maritime drawings that cite two different MIL-PRFs for Group A & B testing. This apparent lack of standardization concern was brought up in the January 2021 SAE CE-11 (government/industry passive components) meeting, and DLA was given a TASK (TASK 21-101), to see if these DLA Land and Maritime drawings could be standardized on the testing requirements. The same task seeks to determine if there is sufficient interest in creating new MIL-PRFs dedicated to any of the current sense resistor technologies.

Proposal. DLA Land and Maritime sent out a survey that asked for the review of the table of DLA Land and Maritime drawing shown in Attachment 1 and to complete the survey in **Attachment 2**.

III. RESULTS: The responses to the attachment 2 survey was low with 4 military responses stating they were interested in the results or had no comment at all, and 4 responses from the manufacturers, one stated that they do not make current sense resistors, another stated that they do not make any of the resistors on attachment 1 but they did provide two other resistors that they manufacture and would like to include them in the standardization of these resistors, and lastly two manufacturers stated they would like to be part of working group to standardize the DLA Land and a Maritime drawings and if call for a military performance specification. No OEMs responded. The Task was also brought up at the September 2021 SAE-CE-11 meeting. With the support of Aerospace, Boeing, NASA, Vishay Dale, and State of the Art, it was agreed that a new performance specification would be developed.

IV. CONCLUSIONS: The results of this study conclude that similar constructed current sense resistor should have their testing requirement standardized, and a military performance specification will be created.

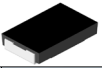
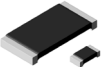
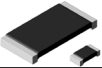
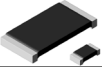
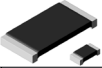
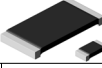
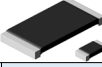
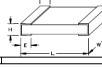
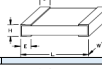
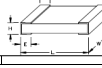
V. RECOMMENDATIONS: DLA Land and Maritime recommends that a new performance specification be developed along with associated slash sheets.

ATTACHMENT 1

DLA Drawings for Current Sense Resistors

Compiled by Jay Brusse/SSAI at NASA Goddard

12/16/2020

Drawing #	Drawing Title	Manufacturer Generic Part Type	Manufacturer	Code	Location	Resistor MIL Spec Reference	Resistor Technology	Size	Resistance min (Ω)	Resistance max (Ω)	Power Rating (W)	Temp @ Full Power (°C)	TCR (ppm/°C)	Zero Power Temp (°C)	Testing Options	picture
06003	RESISTOR, CHIP, FIXED, POWER METAL STRIP, SURFACE MOUNT, LOW VALUE (2 WATT), STYLE 4527	WSR-2	Vishay Dale	CAGE 2799A	Be'er Sheva, Israel	55342	Metal Strip	4527	0.01	1	2	70	75	275	Group A (Tshock, DCR), Group B (STOL, solder mount integrity and Power Moisture)	
06007	RESISTOR, CHIP, FIXED, POWER METAL STRIP, SURFACE MOUNT, LOW VALUE (0.1 WATT), STYLE 0603	WSL0603	Vishay Dale	2799A 91637	Be'er Sheva, Israel Columbus, NE	32159	Metal Strip	0603	0.01	0.1	0.1	70	75	170	Group A (Tshock, DCR), Group B (STOL, solder mount integrity and Power Moisture)	
06008	RESISTOR, CHIP, FIXED, POWER METAL STRIP, SURFACE MOUNT, LOW VALUE (0.125 WATT), STYLE 0805	WSL0805	Vishay Dale	2799A 91637	Be'er Sheva, Israel Columbus, NE	32159	Metal Strip	0805	0.005	0.2	0.125	70	75	170	Group A (Tshock, DCR), Group B (STOL, solder mount integrity and Power Moisture)	
06009	RESISTOR, CHIP, FIXED, POWER METAL STRIP, SURFACE MOUNT, LOW VALUE (0.25 WATT), STYLE 1206	WSL1206	Vishay Dale	2799A 91637	Be'er Sheva, Israel Columbus, NE	32159	Metal Strip	1206	0.001	0.2	0.25	70	75 to 275	170	Group A (Tshock, DCR), Group B (STOL, solder mount integrity and Power Moisture)	
06010	RESISTOR, CHIP, FIXED, POWER METAL STRIP, SURFACE MOUNT, LOW VALUE (0.5 WATT), STYLE 2010	WSL2010	Vishay Dale	2799A 91637	Be'er Sheva, Israel Columbus, NE	32159	Metal Strip	2010	0.001	0.5	0.5	70	75 to 275	170	Group A (Tshock, DCR), Group B (STOL, solder mount integrity and Power Moisture)	
06011	RESISTOR, CHIP, FIXED, POWER METAL STRIP, SURFACE MOUNT, LOW VALUE (1.0 WATT), STYLE 2512	WSL2512	Vishay Dale	2799A 91637	Be'er Sheva, Israel Columbus, NE	32159	Metal Strip	2512	0.0005	0.5	1	70	75 to 400	170	Group A (Tshock, DCR), Group B (STOL, solder mount integrity and Power Moisture)	
06012	RESISTOR, CHIP, FIXED, POWER METAL STRIP, SURFACE MOUNT, LOW VALUE (2.0 WATT), STYLE 2816	WSL2816	Vishay Dale	2799A 91637	Be'er Sheva, Israel Columbus, NE	32159	Metal Strip	2816	0.002	0.1	2	70	75	170	Group A (Tshock, DCR), Group B (STOL, solder mount integrity and Power Moisture)	
07011	RESISTOR, FIXED, CURRENT SENSING, METAL STRIP, HIGH PRECISION, SURFACE MOUNT, STYLE 2512	CSM2512	Vishay Precision Group	0066A	Holon, Israel	49465	Metal Strip, 4 Terminal	2512	0.003	0.2	1	70	15 to 20	170	Group A (DCR), Group B (Solvents, Tshock, TCR, Low Temp Storage, STOL, DWV, IR, Moisture, terminal strength, Life, Shock, Vibe, High Temp)	
07012	RESISTOR, FIXED, CURRENT SENSING, METAL STRIP, HIGH PRECISION, SURFACE MOUNT, STYLE 3637	CSM3637	Vishay Precision Group	0066A	Holon, Israel	49465	Metal Strip, 4 Terminal	3637	0.002	0.2	2 to 3	70	15 to 25	170	Group A (DCR), Group B (Solvents, Tshock, TCR, Low Temp Storage, STOL, DWV, IR, Moisture, terminal strength, Life, Shock, Vibe, High Temp)	
08003	RESISTOR, CHIP, FIXED, CURRENT SENSING, ULTRA PRECISION, STYLE 1625	VCS1625	Vishay Precision Group Texas Components	0066A 2X034	Holon, Israel Houston, TX	55342	Bulk Metal Foil, 4 terminal	1625	0.01	10	1	70	3 to 50	150	Group A (Tshock, DCR, Solderability, Solvents, Marking), Group B (TCR, STOL, mounting integrity)	
10005	RESISTOR, PRECISION CURRENT SENSOR, 100 WATTS	TGHG	Ohmite/Victoreen	44655	Matamoros, Mexico	55342	???, 4 terminal	1.5" x 1"	0.0005	1	100	70	60 to 500	155	Group A (Tshock, DCR, Solvents, Marking), Group B (TCR, mounting integrity)	
10006	RESISTOR, CURRENT SENSE, OPEN AIR, STANDARD LEADS, 1 WATT	OAR-1	TT Electronics	SWJ96	Christ Church, Barbados	39007	Metal Strip	0.45(L) x 0.065(D)	0.005	0.1	1	85	20	125	Group A (DCR only), Group B (visual, solvents)	
10007	RESISTOR, CURRENT SENSE, OPEN AIR, STANDARD LEADS, 3 WATT	OAR-3	TT Electronics	SWJ96	Christ Church, Barbados	39007	Metal Strip	0.6(L) x 0.065(D)	0.005	0.1	3	85	20	125	Group A (DCR only), Group B (visual, solvents)	
10008	RESISTOR, CURRENT SENSE, OPEN AIR, STANDARD LEADS, 5 WATT	OAR-5	TT Electronics	SWJ96	Christ Church, Barbados	39007	Metal Strip	0.8(L) x 0.065(D)	0.005	0.05	5	85	20	125	Group A (DCR only), Group B (visual, solvents)	
10010	RESISTOR, CURRENT SENSE, OPEN AIR, METAL ALLOY STRIP, 5 WATTS	OAR-XP	TT Electronics	SWJ96	Christ Church, Barbados	39007	Metal Strip	4525	0.001	0.025	5	70	40 to 240	225	Group A (DCR only)	
11007	RESISTORS, CHIP, FIXED, CURRENT SENSE, ULTRA PRECISION, STYLE 1206	TFS1206	IRC	57027	Corpus Christi, TX	55342	Metal Film??	1206	0.01	1	0.5	70	100 to 1000	150	Group A (Tshock, DCR, Solderability, Solvents, Marking), Group B (TCR, STOL, mounting integrity)	
11008	RESISTORS, CHIP, FIXED, CURRENT SENSE, ULTRA PRECISION, STYLE 2010	TFS2010	IRC	57027	Corpus Christi, TX	55342	Metal Film??	2010	0.01	1	1	70	100 to 1000	150	Group A (Tshock, DCR, Solderability, Solvents, Marking), Group B (TCR, STOL, mounting integrity)	
11009	RESISTORS, CHIP, FIXED, CURRENT SENSE, ULTRA PRECISION, STYLE 2512	TFS2512	IRC	57027	Corpus Christi, TX	55342	Metal Film??	1206	0.01	1	2	70	100 to 1000	150	Group A (Tshock, DCR, Solderability, Solvents, Marking), Group B (TCR, STOL, mounting integrity)	



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Attachment 2

28 May 2021

Survey Questions:

1. Your Name:
Your Company:
Your email:
Your Phone number:

Military/OEMs: (Manufacturers skip to question 6)

2. Do you use any of the current sense resistors from Attachment 1? Which ones?
3. Do you use any other current sense resistors that are not on the attachment 1 list? If so, which ones?
4. Currently the DLA Land and Maritime drawings are using four different FSC 5905 reference specifications and the testing of those specifications. Would you support developing one testing scheme for all the DLA Land and Maritime drawings?
5. Would you like to see and would support developing a military performance specification to handle all or some current sense resistors? Which current sense resistors would you like to become a MIL-PRF specification?

Manufacturers:

6. What current sense resistors do you manufacturer?
7. Which of the above current sense resistors are sold to military programs?



8. Currently the DLA Land and Maritime drawings are using four different FSC 5905 reference specifications. Would you support developing one testing scheme for all the DLA Land and Maritime drawings?

9. Would you like to see and would support developing a military performance specification to handle all or some current sense resistors? Which current sense resistors would you like to become a MIL-PRF specification?