Abstracts, Electronic Environment 2016

TELEKOM:
EMC: A1:1
Ingvar Karlsson
Senior Specialist, Ericsson AB

Channel Operating Margin, COM, a new method to compliance check high speed serial links

Vid konstruktion av höghastighetslänkar såsom 100 GBASE Ethernet är det vitalt att dessa fungerar med ett bitfel (Bit Error Rate), BER, som är lägre an specificerad. Den tidigare traditionella kraven-bilden på elektriska kanaler är att ett antal parametrar är specificerade och till varje parameter finns en kravlinje som man måste ligga på rätt sida om. Denna metod ger en stelbent process i konstruktionen av en kanal. Alla kraven måste ligga på rätt sida. Men finns det marginal till kravlinjen för vissa parametrar så kan det tillåta att andra parametrar ligger på fel sida om karvlinjen och fortfarande uppfylla bitfelskravet. Den tidigare traditionella kraven-bilden på kanaler ger alltså i många fall en överdesign med ökad kostnad eller andra inskränkningar som följd .

För att minska denna överdesign så är COM framtagen som kontroll metod. COM som metod är t.ex. specificerad i IEEE 802.3 för elektriska 100 GBASE Ethernet kanaler. COM simulerar fram ett öga inne i mottagar-kretsen med alla signal konditionerings enheter på plats. Därmed kan man bättre prediktera bitfel mm. Simuleringen sker med statistiska metoder och med generiska drivare och mottagare.

Presentationen kommer gå igenom olika metoder att kontrollera elektriska kanaler samt deras för och nackdelar. Ge en kortare genomgång om hur COM är uppbyggd och fungerar.

TELEKOM:
EMC: A1:2
Ingvar Karlsson
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Common mode effects in high speed serial links

In production of printed circuit boards (PCB) signal skew will be introduced in differential traces due to the weave effect. A skew that will vary from PCB to PCB. This signal skew generates mode conversion that together with poor common mode properties along the high speed channel will degrade the system performance. For example might the skew effect give a crosstalk much higher than the pure differential crosstalk. If the poor common mode properties in the channel are high and the skew can be expected to be high enough, the channel performance will be affected. Some PCB's, with right combination of skew, might fail with too high bit error rate (BER) and other PCB's will work.

TELEKOM:
EMC: A1:3
Jan Carlsson
Prof., SP Sveriges Tekniska Forskningsinstitut

Indoor mobile coverage – Results from a pre-study

Results from a pre-study led by SP and financed by the Swedish Energy Agency regarding indoor mobile coverage will be presented. The aim of the project is to map the challenge of high thermal insulation of buildings and good penetration of radio waves for the relevant frequencies and begin the work on finding energy efficient solutions that meet both criteria. Results from field measurements and analyses will be presented.

MILJÖTÅLIGHET: A2:1
Rebecka Eriksson
Environmental Test Engineer,
Bofors Test Center

3D-röntgen för elektronikapplikationer

MILJÖTÅLIGHET: A2:2
Karolina Johansson
Produktionstekniker, Lasertech LSH AB

3D-printing för elektronikapplikationer

3D-printingen har skapat helt nya förutsättningar inom tillverkningsindustrin. Idag går det att tillverka unika detaljer i både plast och metall snabbt och enkelt utan några verktyg.

Jag kommer i min föreläsning visa exempel på 3D-printade komponenter samt detaljer där 3D-tekniken underlättat och förkortat utvecklingsfasen för nya produkter.

FORDON:
MILJÖTÅLIGHET: B1:1
Niklas Karpe
Senior Manager, Ph.D., Scania CV AB

Kvalitetssäkring och elektronikfel i tunga fordon

Avancerade styrsystem för förbättrad säkerhet och energieffektivitet driver utveckling av fler elektroniksystem i fordon. Antalet elkomponenter per fordon har de senaste årtiondet ökat med 5-10% per år samtidigt som användarna förväntar sig färre fel per fordon och körd km.
De viktigaste metoder för accelererad testning av el och elektronik har succesivt förbättrats och anpassats för att fånga kända felmoder för elektronik i tunga fordon. En översikt av dessa felmoder kommer ges.

Många av dagens kvalitetsutfall bottnar i produktionsmässiga variationer och oförutsedda krävande fordonsanvändningar snarare än i kända felmoder för elektronik. För att på ett tidigt stadium hitta och rätta till dessa fel fordras nya metoder, främst modern diagnostik och snabb uppföljning av uppkopplade fordon vilket kommer beskrivas med några exempel.

FORDON:
EMC: B1:4
Krister Kilbrandt
Manager - EMC Vehicle group, SP Sveriges Tekniska Forskningsinstitut

EMC for vehicles of today and tomorrow – a short overview

New technologies for autonomous driving and active safety systems are now rapidly introduced on the market. Since these systems are safety critical it is of vital importance that they function as intended in all kinds of realities and need therefore to be thoroughly EMC tested before they are put on the market.
Another challenge is EMC measurements and legal demands for new evolving charging systems, such as fast DC charging and inductive charging.
This short overview will address EMC legal demands, measurement methods and standards that these new technologies are facing.

FORDON:
EMC: B1:5
Björn Bergqvist
Technical Expert, Volvo Cars

EMC for wireless Communication systems in Vehicles – EMCCOM

The EMCCOM project (diarienr. 2012-00923) is a FFI project within the Vehicle Development program. EMCCOM is a three year project that started 2012-09-14 and ended 2015-06-30. The project had a total budget of 7,3 MSEK. Partners in the project have been VCC, Volvo AB, Provinn AB, FOI Swedish Defence Research Agency and SP Technical Research Institute of Sweden.

EMCCOM have developed new EMC test methods for vehicle electronic units and simulation models. Both to be used to protect the performance (both reliability and capacity) of wireless digital communication services and by that ensure high availability of implemented safety and transport efficiency functions. Better precision in test methods and models will further reduce the costs in current test procedures and in a longer perspective greatly reduce the need for complete vehicle testing, which is very time consuming, costly and only possible late in the product development.

Questions that have been addressed in the project include:
• Which detector has the best correlation between a Radio Frequency (RF) electromagnetic interference measurement and the resulting degradation of wireless system performance?
• What level of electromagnetic interference is acceptable for a wireless communication system in a vehicle?
• What level of electromagnetic emission is acceptable for an electronic control unit to be used in a vehicle?
• What measurement method (detector, resolution bandwidth, ...) is best suited to characterize the RF electromagnetic emissions from an electronic control unit to make it possible to predict the resulting performance degradation of an exposed wireless communication system?
• Is it possible to develop very simple models to be used to predict the performance degradation of an exposed wireless communication system?

Systems that have been studied are 3G, 4G, GNSS (GPS), WLAN (802.11g), C-ITS (802.11p).

ENERGILAGRING: B1:6
Daniel Månsson
Tekn. Dr., Assistant Professor, KTH Royal Institute of Technology

Review of the possibilities of magnetic energy storage using permanent magnets in Halbach configurations

Here an unusual approach to energy storage is discussed. Forcing two permanent magnets, with opposing direction of magnetization (e.g., "North" – "North"), together will require some work. This configuration will act as a highly non-linear and parameter de pendent magnetic spring. When the magnets are brought together the work expended can be stored by mechanically fixing them in that position. Barring, e.g., mechanical losses, the energy can then later be utilized when they are again released and repel each other. However, such a configuration, using two normal bar magnets, is not an optimal usage of magnetic material.

A Halbach array is a magnetic structure in which the direction of magnetization, M, is not constant but in fact rotates along one dimension

$$dF_{\max} = \frac{9.73\cdot}{\lambda\sqrt{G}} = \frac{9.73\times f_{\max}}{300\times\sqrt{G}} = 0.018\cdot f_{\max} \quad \text{or in dB as} \quad dF_{\max\_dB} = 20\cdot\log(f_{\max}) - 34.9 \quad (1)$$

This configuration leads to a "one-sided flux", i.e., the magnetic field is enhanced on one side of the structure and almost completely canceled on the other side. (This is constitutes however not a magnetic monopole!)
Thus, for more optimal usage of magnetic material two Halbach arrays, with opposing magnetizations, facing each other are utilized. If the magnetizations are chosen properly then these structures will experience repelling forces as they are brought together and we can store the energy. Several practical issues, in realizing this energy storage medium, are here discussed and explained via analytical method (i.e., Maxwell's stress tensor) and numerical simulations (using FEMM). For example, mechanical shearing forces inside the magnetic structures, demagnetization risk due to both increased magnetic field (and temperature) inside the material, possible losses due to eddy currents in surrounding support fixtures are discussed. Finally, it was seen that this described medium can reach a maximum energy density of 250 kJ/m3 which is equivalent to some other commercial systems (e.g., using compressed air energy storage, CAES).

The benefits of such as energy storage medium is that the charge and discharge time can, compared to most other energy storage systems, be very short without introducing intrinsic losses. In addition, due to the nature of the medium, the stored energy doesn't, for normal conditions, degrade

measurably even over very long periods of time. However, as the cost of vital rare earth materials (e.g., Neodymium) are today very high, and no direct replacement for these exists, the commercial realization of such an energy storage system is, thus, currently not realistic.
However, this is the only principal drawback of the energy storage system.

PROVNING & SIMULERING:
EMC: B2:1
Tomas Hurtig
Deputy Research Director, FOI, Swedish Defence Research Agency

Förstörande HPM-provning i modväxlande kammare

Medan EMC-provning av emission och immunitet hos elektronisk utrustning vid låga till måttliga fältstyrkor stöds av flera internationella standarder och regelbundet utförs inom industriell elektronikutveckling och av testinstitut för konsumentprodukter, är testning vid mycket höga fältstyrkor inte lika utvecklad. Detta börjar bli allt mer angeläget när utvecklingen av mikrovågsvapen (eng. High-Power Microwave, HPM) mognar och framträder som en mera allvarlig fråga än den varit under de senaste decenniernas forskning och utveckling inom HPM-området.

För att främja utvecklingen av standarder och testmetoder för susceptibilitet hos elektronisk utrustning utsatt för HPM-hotnivåer utvecklar FOI en anläggning för förstörande HPM-provning och en två-stegs testmetod:

(1) I en modväxlande kammare (eng. Reverberation Chamber, RC) bestäms det minsta elektriska fält som krävs för att förstöra ett provobjekt som funktion av frekvens inom ett frekvensintervall.
(2) Vid de mest känsliga frekvenserna används en HPM-generator för att bestämma den mest känsliga infallsvinkeln mot objektet.

Förstörande provning av enkla elektroniska kretsar har genomförts i en RC. Resultaten av dessa stödjer hypotesen att förstöring av elektroniska kretsar kan beskrivas med Tascas formel för beroendet av behövlig energi som funktion av pulslängden i enstaka komponenter. Resultat från tester av några enkla elektroniska objekt presenteras och diskuteras tillsammans med en beskrivning av testmetoder under utveckling och deras implikationer för en framtida standard för HPM-testning.

PROVNING & SIMULERING:
EMC: B2:2
Jan Carlsson
Prof., SP Sveriges Tekniska Forskningsinstitut

Measurement Method for Determining Shielding Effectiveness of Cable Feedthroughs

An efficient and repeatable measurement method for determining shielding effectiveness of cable feedthroughs based on the use of nested reverberation chambers is presented. The measurement method is validated by comparing measurements on an isolated conductor penetrating the shield, with a simple theory based on basic circuit theory in combination with antenna theory. The agreement between measurements and simulations is very good in the considered frequency range 400 MHz to 4 GHz. Measurement results for commercially available cable feedthroughs will also be presented.

PROVNING & SIMULERING:
EMC: B2:3
Mats Bäckström
PhD, Adj. Professor, Royal Institute of Technology (KTH), Saab Aeronautics

The Relation Between Immunity Testing in Anechoic and Reverberation Chambers

The problem in relating the outcome of an immunity test in a reverberation chamber to free-space conditions was identified and addressed already in 1978. In a reverberation chamber the equipment-under-test (EUT) is simultaneously irradiated by plane waves coming from many directions. By e.g. use of a rotating stirrer located inside the chamber the boundary conditions are changed thereby generating different field conditions. The concept of statistical isotropy, sometimes used for reverberation chambers, means that the ensemble average of the signal received by an antenna (or by a critical component inside the EUT) will be independent of the directional properties of the antenna. The fact that the variations in directivity (and polarization) are averaged out in a reverberation chamber indicates that an immunity test carried out in a reverberation chamber might be less severe than a test carried out in an anechoic chamber (AC), at least if the anechoic-chamber test comprises the worst angle of incidence and polarization. Of course, the opposite may also be true, i.e. that the immunity test in an anechoic chamber might be less severe than a test in a reverberation chamber. This happens if all the test cases carried out in the anechoic chamber corresponds to small values of the directivity times the polarization of the EUT, i.e. if the angle of incidence and/or the polarization corresponds to a weak coupling. The exact relation between the stresses an EUT will face in the two environments depends e.g. on the definition of the electric field used for immunity testing in a reverberation chamber. In this paper a review will be given on how, and under which conditions, the two kinds of electromagnetic environments can be related.

PROVNING & SIMULERING:
MILJÖTÅLIGHET: B2:4
John Goodfellow
Dr., IMV Corporation

Integrated Shaker Manager – The Future of Vibration Testing

IMV Corporation is well known for technical innovation in the Vibration Testing market with over 50 patent applications. The latest innovation, the Intelligent Shaker Manager (ISM) is the start of the next evolution of Vibration Test Systems (VTS) bringing an intelligent approach to running, testing and maintaining a VTS not seen before in the industry.

At the core of ISM is the Energy Manager (EM). The EM continuously optimises system parameters to minimise energy used by the VTS system using advanced real-time algorithms. This paper will describe the control methods adopted and how these bring automatic energy savings of up to 80%, without user intervention.

System modelling will be described and how this is applied to the energy saving algorithms.
The paper will show how the techniques developed can be extended to multi-axis test systems, bringing substantial energy savings and also a quietness of operation not seen before in VTS.

Further benefits of CO2 reductions and reducing noise to improve the operating environment will be demonstrated.

The Service Manager (SM) is the second module of ISM and monitors 184 key system parameters, allowing a high level of remote system diagnostics. This key data logging capability, particularly under fault conditions brings significant improvements in system up-time.

Future developments will be discussed, including predictive maintenance techniques and test optimisation techniques.

Finally, the benefits to the user and owner of the VTS will be summarized showing how reduced energy, increased system availability time and improved protection of the VTS are realized increasing the return on investment.

PROVNING & SIMULERING:
MILJÖTÅLIGHET: B2:5
Ilia Belov, PhD
Dept. of Computer and Electrical Engineering
Jönköping University

Thermal fatigue life prediction: consequences of cycle reduction and material property variation.

The lecture addresses the effect of variations both of accelerated test profile and of SAC305 solder Young's modulus on thermal fatigue life prediction for a lead-free PBGA256 package.

Temperature cycling test results are provided for FE model validation purposes along with results of Young's modulus measurements on solder joints at different locations in cycled and as-delivered electronic packages.

The FE simulations supply accumulated creep strain energy density in the critical solder joint of the PBGA256 package, which is taken as the damage metric in a physics-of-failure-based lifetime prediction approach.

The effect of cycle reduction and counting techniques is quantified by introducing different temperature profiles having identical dwell- and period time characteristics. For the investigated accelerated test profiles, a difference of up to 40% in accumulated damage per cycle is determined.

Under the provided assumptions, the maximum variation of thermal fatigue life of SAC305 solder joints is within 30% as the result of experimentally determined Young's modulus variation in PBGA256 packages.

As a conclusion, cycle reduction and counting have to be used with care and might cause errors in fatigue life estimations. Experimentally found change of Young's modulus of solder in the cycled PBGA256 packages, reveal the demand for more advanced models in the area of thermal fatigue life prediction.

PROV & SIMULERING:
MILJÖTÅLIGHET: B2:6
Roger Källberg
Chairman of SEES, Business Unit Manager, Intertek

HALT (Highly Accelerated Life Test)

Accelererad livstidsprovning för elektronik, hur bör du resonera rent praktiskt innan, under och efter ett HALT prov (HALT = Highly Accelerated Stress Test) för att få ut det mesta möjliga av ditt prov. Under föreläsningen kommer Ni att få ta del av några praktiska råd och tips kring hur ett upplägg inför ett accelererat kan se ut.

PROV & SIMULERING:
MILJÖTÅLIGHET: B2:7
Gunnar Kjell
SP Sveriges Tekniska Forskningsinstitut

Mekanisk livslängdsprovning baserat på fältmätning – a case study

Det finns ett antal 'färdiga' vibrationstester för olika typer av produkter och miljöer. Men för utrustning som skall placeras i speciella miljöer säger såväl MIL standard som IEC att tester som 'skräddarsytts' utifrån den verkliga miljön är att föredra. Men hur gör man när man har en stor mängd vibrationsdata från fältmätningar som skall användas för att specificera åtta timmars provningar som skall simulera vibrationer och stötar under sex års drift? Vilken typ av excitering skall användas? Hur tidsforcerar man? Hur skall utrustningen vara driftsatt under provningen? Hur detekteras intermittent felfunktion? Hur gör man riskanalysen inför provningen? Det finns många frågor som inte har något entydigt svar, men som ändå måste hanteras inför en provning. Föredraget vill visa hur dessa frågor hanterades i en specifik situation.

SÄKERHET & FÖRSVAR:
EMC: C1:1
Sara Linder
Senior Scientist, FOI, Swedish Defence Research Agency

Consequences of Radio Transmitter Out-of-Band Properties

Military tactical communications for ground-based operations requires many co-located communication systems on combat vehicles. There are also several situations where many vehicles are close together in a small area. Typical frequency bands for such communications are the 30 – 88 MHz band for army combat radio and the harmonized NATO band 225 – 380 MHz. In these frequency bands different types of communication systems must co-exist e.g. frequency-hopping (FH) and fixed-frequency systems. Furthermore, in Europe the lower and upper part of the 225-400 MHz band is planned to be used for civilian services e.g. 225-240 MHz for DAB and DVB-T2 and 380-400 MHz for TETRA. This means a reduction of the available frequency range for tactical communications. Moreover, the military demands of different communication services are increasing, resulting in a continuous increase in amount of co-located communication systems in these bands. A consequence is that the used frequencies will be less separated, meaning that out-of-band properties will be of severe importance for the performance of the individual systems. Another practical consequence is that the possible co-location distance between different combat vehicles is directly dependent on the out-of-band properties of in-going systems. One fundamental way of reducing intersystem-interference on a platform is to reduce the inter-

ference from out-of-band emissions from wireless transmitters. Out-of-band properties for radio systems can be either specified for a certain application or by referring to a standard requirement. In order to determine what requirement that is necessary, dedicated analyses must be done and often a trade-off between the desired properties, possible technical solutions and the economic cost must be done. Typically such analyses are done in the integration work for a certain platform. However, including possible co-location distances between combat vehicles in such analyses are also necessary since there is a direct connection between spectrum properties and co-location consequences.

Here, we present examples of how radio system performance can be affected by out-of-band properties and how this in turn will affect the possible separation distances between combat vehicles. An example is shown in the figure below, where the co-located system should be located in the green area to avoid problems with the communication link. Moreover, consequences for the possible communication range and the service available on the radio links are also exemplified. We show the importance of making tactical considerations already in the specification of requirements for out-of-band properties of tactical communication systems

SÄKERHET & FÖRSVAR:
EMC: C1:2
Patrik Eliardsson
Research Engineer, FOI, Swedish Defence Research Agency

Detection of unintentional and intentional electromagnetic interference at critical societal functions

Wireless technologies for critical societal functions is common today. Criminals have already recognized this vulnerability and used it in various types of crimes. Not only intentional interference but also unintentional radiated electromagnetic interference can be a great problem for these types of services. Few low cost systems that can monitor the electromagnetic environment in the vicinity of critical infrastructure are available today. What is generally used today is spectrum analyzers. Spectrum analyzers are a very qualified measurement tool but they are often used only to take snapshots of the electromagnetic environment and they are expensive to buy and operate over time. What is needed is continuous monitoring of the radio noise environment in the surrounding of critical systems. In this paper, an example of how low cost commercially off-the-shelf components can be used to cost effectively construct and implement a qualified detection and classification of radio noise environment at societal critical infrastructure. Examples are given how such a system can be used to identify areas where potential problems can occur, if a system is deployed in that area and uses the free industrial, scientific and medical (ISM) frequency band.

In this paper, also another example application of this system is given. Here, the focus is on the civilian GPS signal that is used for positioning and navigation and also provides an exact time to many other systems. The developed detection and classification system is in this example used to detect GPS jammers. Results from field trails with the GPS jammers are provided for this example.

Results from the experiments with the developed detection system show that GPS jammers can be detected at large distances, although the detection distance will decrease in populated areas. Different jammers can also be distinguished with the classification method built in the system. For the free ISM band blockers for car remote key entry systems can be detected. In addition, areas, where potential problems can occur, can be localized with the developed low cost system for monitoring of the electromagnetic environment.

SÄKERHET & FÖRSVAR:
EMC: C1:3
Bing Li
KTH Royal Institute of Technology

Frequency response analysis of IEMI on critical computer system in low voltage power line network

In this paper, we analyzed the propagation of intentional electromagnetic interference (IEMI) disturbances along low voltage power line network, which consists of multiple junctions and branches connected by different types of terminal loads (critical computer systems, lights, sockets, etc.), and calculated the corresponding frequency responses. Meanwhile, the frequency responses are also computed by a commercial electromagnetic simulator, to verify our computing results. Moreover, we define the failure thresholds for different loads. By using statistical methods, we classify the sensitivity level at different positions in the network, and find the most vulnerable area. To make sure the critical computer work reliably, we give some basic recommendation on how to place it in the network.

SÄKERHET & FÖRSVAR:
EMC: C1:4
Bengt Vallhagen
Test Engineer, Saab Aeronautics

Q-value in Avionic Bays and other Multiresonant Cavities – Measurements in Time- and Frequency-Domain

In modern aircraft, it is vitally important to protect its electronic equipment – avionics – against High Intensity Radiated Fields (HIRF), i.e. electromagnetic fields from transmitters such as radio or radar. Vulnerable avionics may be placed in shielded avionic bays as part of this protection. The average Shielding Effectiveness (SE) of such a bay can be expressed as:

$$\langle SE \rangle = \frac{2\pi V}{\sigma_a \lambda Q}$$

...which shows that σa (the aperture transmission cross section) and Q (the cavity quality factor) have impact on the SE. Thus; it is important to know Q.

A study consisting of several experimental measurement campaigns have been performed, with aim to verify a methodology of determining the Q-value of multiresonant cavities, such as aircraft avionic bays. Besides the relatively well-known methods of measurements in frequency domain, refined methods of measurements in time-domain have been verified, including a technique with only one antenna – operating in both transmitting and receiving mode.

SÄKERHET & FÖRSVAR:
EMC: C1:5
Per Ängskog
Ph.D. candidate, KTH Royal Institute of Technology

Skärmverkan och mikrovågseffekter på fönster och fönsterglas

Ett allt vanligare fenomen är att mobil telekommunikation inte fungerar i moderna/nybuggda hus. Detta har härletts till de moderna energisparfönster som monteras in. Denna skärmverkan kan också vändas till en fördel i de fall man vill skydda verksamhet från yttre elektromagnetiska störningar samt i de fall då man vill undvika att röjande strålning från elektronisk utrustning läcker ut och kan avlyssnas.

Här kommer vi presentera resultaten från mätningar av skärmverkan hos dels fönster av olika generation och dels fönsterglas med olika funktion som används för att bygga upp dessa fönster. Dessutom presenteras resultat från mätningar av hur skärmverkan påverkas vid bestrålning med högeffekts mikrovågsstrålning (HPM).

SÄKERHET & FÖRSVAR:
MILJÖTÅLIGHET: C1:6
Jussi Myllyluoma
Applications Engineering Manager Thermal

The Implications of Thermal Management Technology on Network Centric Battlefield Soldier Systems

The concept of Network Centric Warfare (NCW) and its further evolution is causing a paradigm shift on the battlefield, with massive generation of real-time intelligence, and this intelligence at the same time becoming available further and further down in the chain of command. The full benefits of NCW will only become fully realised when this availability is pushed down to the level of the individual soldier. However, for our forces to truly leverage the potential benefits, several obstacles must be overcome; not least those pertaining to communication technology and information overload. Consequently, in the near-term future we will need to design soldier-worn solutions for e.g. highly advanced real-time 3D rendering, M2M/GUI, and wireless broadband systems, along with a power management system for all of these, all ruggedized and required to operate reliably in a, not least thermally, highly challenging environment – without, most importantly, these solutions being allowed in any way to compromise the soldier's stealth or combat effectiveness. Apart from any other design complexities involved, this will pose a thermal design challenge of unprecedented scale. This seminar will discuss the particulars of this challenge, and the implications thereon of available thermal management technologies.

KVALITETSSÄKRING: MILJÖTÅLIGHET: C2:1
Jussi Myllyluoma
Applications Engineering Manager Thermal

Framtidssäkring av inbyggnadslösningar genom termisk design

Att använda inbyggnadsmoduler är ofta ett attraktivt sätt att framtidssäkra konstruktioner. Problemkan dock uppstå när modulen skall uppgraderas, och komponenter har bytt plats på ett sätt som gör att tidigare anpassade kyllösningar måste konstrueras om. Alternativet är ofta att förlita sig på modulltillverkarens egna kyllösningar, som inte alltid är optimala, och sällan tillåter att konstruktionens formfaktor slimmas så långt som elektroniken ensamt skulle tillåta. Men finns det en tredje väg? Kan man konstruera kyllösningar som på ett kostnadseffektivt sätt kan anpassas både efter konstruktionens unika förutsättningar och efter godtyckliga ändringar i modulernas topografi?

KVALITETSSÄKRING:
MILJÖTÅLIGHET: C2:2
Mats Lindgren
Manager reliability testing, SP Sveriges Tekniska Forskningsinstitut

The mindset of reliability and how to perform product validation

The authors will introduce the participants to the mindset of reliability and how to perform product validation. It is not enough to have the good idea about functions, if critical reliability factors isn't identified and constantly addressed already from day one during the development.

When you first are able to look beyond the perfect product in a perfect world, you will enter a world of creativeness in destruction and accidents – and you must take control to prepare your product for the world.

This paper will include different strategies for developing a test plan, such as test according to standards, standard tests and benchmarking, test until failure etc. Further a discussion about root cause analysis will be presented. The paper will not cover software reliability or go into cost and management aspects.

KVALITETSSÄKRING:
EMC: C2:4
Sven-Erik Sjöström
EMC Engineer, EMC Services Elmiljöteknik AB

Software, the weak link in EMC compliance

When an EMC test is performed, a weak link in the test is the software that is used to monitor the equipment during test (EUT). The software that is used is often used during development to get the right functionality but it is not designed to meet EMC requirement – and in fact most of the designers are not aware of the EMC requirement. They realizes the requirements when they are at place in the EMC lab, which means that it can be to late and they have to do a redesign before they can proceed the tests.

The presentation will show some examples of typical tests can be made at an EMC-lab and also what can happen when the software faces the EMC requirements. The presentation will also give some guideline for the software designers what the software should be able to handle. Some of the requirements is important for the equipments to be able to pass the tests and some of the requirements give a more effective testing procedure.

Föreläsare, Electronic Environment 2016

Ilia Belov
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PROVNING & SIMULERING:
MILJÖTÅLIGHET: B2:5
Thermal fatigue life prediction: consequences of cycle reduction and material property variation.

Björn Bergqvist
Technical Expert
Volvo Cars
Keynote Speaker
eMC i självkörande bilar

FORDON:
EMC: B1:5
EMC for wireless Communication systems in Vehicles – EMCCOM

Mats Bäckström
Ph.D. Technical Fellow, Electromagnetic Effects
Adj. Professor, Royal Institute of Technology (KTH)
Saab Aeronautics

PROVNING & SIMULERING:
EMC: B2:3
The Relation Between Immunity Testing in Anechoic and Reverberation Chambers

Jan Carlsson
Prof. SP Sveriges Tekniska Forskningsinstitut

TELEKOM: EMC: A1:3
Indoor mobile coverage – Results from a pre-study

PROVNING & SIMULERING: EMC: B2:2
Measurement Method for Determining Shielding Effectiveness of Cable Feedthroughs

Patrik Eliardsson
Research Engineer
FOI, Swedish Defence Research Agency

SÄKERHET & FÖRSVAR:
EMC: C1:2
Detection of unintentional and intentional electromagnetic interference at critical societal functions

Rebecka Eriksson
Environmental Test Engineer
Bofors Test Center

MILJÖTÅLIGHET: A2:1
3D-röntgen för elektronikapplikationer

John Goodfellow
Dr. IMV Corporation

PROVNING & SIMULERING:
MILJÖTÅLIGHET: B2:4
Integrated Shaker Manager – The Future of Vibration Testing

Tomas Hurtig
Deputy Research Director
FOI, Swedish Defence Research Agency

PROVNING & SIMULERING:
EMC: B2:1
Förstörande HPM-provning i modväxlande kammare

Karolina Johansson
Produktionstekniker
Lasertech LSH AB

MILJÖTÅLIGHET: A2:2
3D-printing för elektronikapplikationer

Ingvar Karlsson
Senior Specialist
Ericsson AB

TELEKOM:
EMC: A1:1
Channel Operating Margin, COM, a new method to compliance check high speed serial links

TELEKOM:
EMC: A1:2
Common mode effects in high speed serial links

Niklas Karpe
Senior Manager, Ph.D.
Scania CV AB

Keynote Speaker
Advanced own electronics and SW development– a survival issue for trucks and buses

FORDON:
MILJÖTÅLIGHET: B1:1
Kvalitetssäkring och elektronikfel i tunga fordon

Krister Kilbrandt
Manager - EMC Vehicle group
SP Sveriges Tekniska Forskningsinstitut

FORDON: EMC: B1:4
EMC for vehicles of today and tomorrow – a short overview

Gunnar Kjell
SP Sveriges Tekniska Forskningsinstitut

PROV & SIMULERING:
MILJÖTÅLIGHET: B2:7
Mekanisk livslängdsprovning baserat på fältmätning – a case study.

Roger Källberg
Business Unit Manager, Chairman of SEES Intertek

PROV & SIMULERING:
MILJÖTÅLIGHET: B2:6
HALT (Highly Accelerated Life Test)

Bing Li
KTH Royal Institute of Technology

SÄKERHET & FÖRSVAR:
EMC: C1:3
Frequency response analysis of IEMI on critical computer system in low voltage power line network

Sara Linder
Senior Scientist
FOI, Swedish Defence Research Agency

SÄKERHET & FÖRSVAR:
EMC: C1:1
Consequences of Radio Transmitter Out-of-Band Properties

Mats Lindgren
Manager reliability testing
SP Sveriges Tekniska Forskningsinstitut

KVALITETSSÄKRING:
MILJÖTÅLIGHET: C2:2
The mindset of reliability and how to perform product validation

Michel Mardiguian
EMC Consultant
Keynote speaker
Not even the best software in the world works, if the hardware does not work

UTBILDNING EMC:
EMC: A3:1 – A3:3

Jussi Myllyluoma
Applications Engineering Manager Thermal

SÄKERHET & FÖRSVAR:
MILJÖTÅLIGHET: C1:6
The Implications of Thermal Management Technology on Network Centric Battlefield Soldier Systems

KVALITETSSÄKRING:
MILJÖTÅLIGHET: C2:1
Framtidssäkring av inbyggnadslösningar genom termisk design

Daniel Månsson
Tekn. Dr., Assistant Professor
KTH Royal Institute of Technology

ENERGILAGRING: B1:6
Review of the possibilities of magnetic energy storage using permanent magnets in Halbach configurations

Ulf Nilsson
Seniorkonsult
Keynote speaker
Not even the best software in the world works, if the hardware does not work

Sven-Erik Sjöström
EMC Engineer
EMC Services Elmiljöteknik AB

KVALITETSSÄKRING:
EMC: C2:4
Software, the weak link in EMC compliance

Bengt Vallhagen
Test Engineer
Saab Aeronautics

SÄKERHET & FÖRSVAR: EMC: C1:4
Q-value in Avionic Bays and other Multiresonant Cavities – Measurements in Time- and Frequency-Domain

Per Ängskog
Ph.D. candidate
KTH Royal Institute of Technology

SÄKERHET & FÖRSVAR:
EMC: C1:5
Skärmverkan och mikrovågseffekter på fönster och fönsterglas.

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