
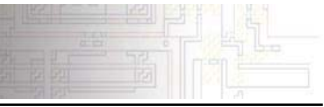


# PROBLEM ADVISORY

<b>1. TITLE (Class, Function, Type, etc.)</b>  <b>Linear Mode Application, Power MOSFET</b>		<b>2. DOCUMENT NUMBER</b> <b>FV5-P-09-01A</b>
		<b>3. DATE (DD-MMM-YY)</b> <b>23 APRIL 2009</b>
<b>4. MANUFACTURER AND ADDRESS</b> <b>International Rectifier, HiRel Products</b> <b>205 Crawford Street</b> <b>Leominster, MA 01453</b>	<b>5. PART NUMBER</b> <b>FSC 5961</b>	<b>6. NATIONAL STOCK NUMBER</b> <b>Not Applicable</b>
	<b>7. SPECIFICATION</b> <b>MIL-PRF-19500</b>	<b>8. TYPE DESIGNATOR</b> <b>QPL-19500</b>
	<b>9. LOT DATE CODE START</b> <b>Not Applicable</b>	<b>10. LOT DATE CODE END</b> <b>Not Applicable</b>
<b>11. MANUFACTURER'S POINT OF CONTACT</b> <b>Milt Boden</b>	<b>12. CAGE</b> <b>69210</b>	<b>13. MANUFACTURER'S FAX</b> <b>(978) 537-4246</b>
<b>14. MFR. POC PHONE</b> <b>(310) 726-8029</b>	<b>15. MANUFACTURER'S E-MAIL</b> <b>Mboden1@irf.com</b>	
<b>16. CROSS REFERENCE VENDOR</b> <b>Not Available</b>	<b>17. CROSS REFERENCE CAGE</b> <b>Not Available</b>	<b>18. CROSS REFERENCE PART</b> <b>Not Available</b>
<b>19. PROBLEM DESCRIPTION / DISCUSSION / EFFECT</b> <b>THIS REVISION PROVIDES NEW INFORMATION FROM INTERNATIONAL RECTIFIER CONCERNING THE SAFE OPERATING AREA CURVES. THE ATTACHED CURVES HAVE BEEN UPDATED WITH THE DC MODE CURVE. PAGE 1 CONTAINS ORIGINAL DOCUMENT. PAGE 2 THROUGH PAGE 14 CONTAIN AMENDMENT A. THIS DOCUMENT IS COMPLETE.</b>  <p>This advisory follows numerous inquiries concerning the operating area of the MOSFET for voltages below the zero temperature coefficient point (sometimes referred to as the linear mode of operation). Devices operated below the zero temperature coefficient gate voltage could be susceptible to failure due to a non-uniform current distribution over the die. This results in a safe operating area (SOA) less than predicted by the thermal characteristic of the package. This condition has always existed in all power MOSFETs and has been discussed in the literature [1].</p> <p>The safe operating area, as presented in datasheets and QPL slash sheets accounts for current focusing for pulses shorter or equal to 10msec. The SOA curves represented for Power MOSFETs do not provide sufficient information for circuit operation with pulses longer than 10msec or in Direct Current (DC) mode.</p> <p>[1] References</p> <ol style="list-style-type: none"> <li>1. Breglio, G.; Frisina, F.; Magri, A. and Spirito, P. "Electro-Thermal Instability in Low Voltage Power MOS: Experimental Characterization," IEEE ISPSD 1999, p. 233.</li> <li>2. Ely, J. "Are Trench FETs Too Fragile for Linear Applications?" Power Electronics Technology, January 2004, p.14.</li> <li>3. Kwan, A.; Teasdale, K.; Nguyen, N.; Ambrus, J.; and McDonald, T. "Improved SOA Analysis for Trench MOSFET's using Spirito Approach," 9th Annual Automotive Electronics Reliability Workshop, Nashville, April 21, 2004.</li> </ol>		
<b>20. ACTION TAKEN/PLANNED</b> <b>International Rectifier (HiRel Products) plans to update their SOA curves to include a DC curve to further assist designers in utilizing our devices. If device application requires operating the Power MOSFET in the linear mode, then the MOSFET should be characterized to ensure proper and safe operation.</b>		
<b>21. DATE MFR. NOTIFIED</b>  <b>Not Applicable</b>	<b>22. MANUFACTURER'S RESPONSE</b> <input type="checkbox"/> REPLY ATTACHED <input checked="" type="checkbox"/> <b>Not Applicable</b> <input type="checkbox"/> NO REPLY	<b>23. ORIGINATOR ADDRESS/POINT OF CONTACT</b> <b>Paul Hebert, International Rectifier – HiRel Products</b> <b>(978) 514-6180</b> <b>phebert@irf.com</b>
<b>24. GIDEP REPRESENTATIVE</b> <b>Paul Hebert</b>	<b>25. SIGNATURE</b> 	<b>26. DATE</b> <b>22 APR. 2009</b>



## FV5-P-09-01 – REVISION A

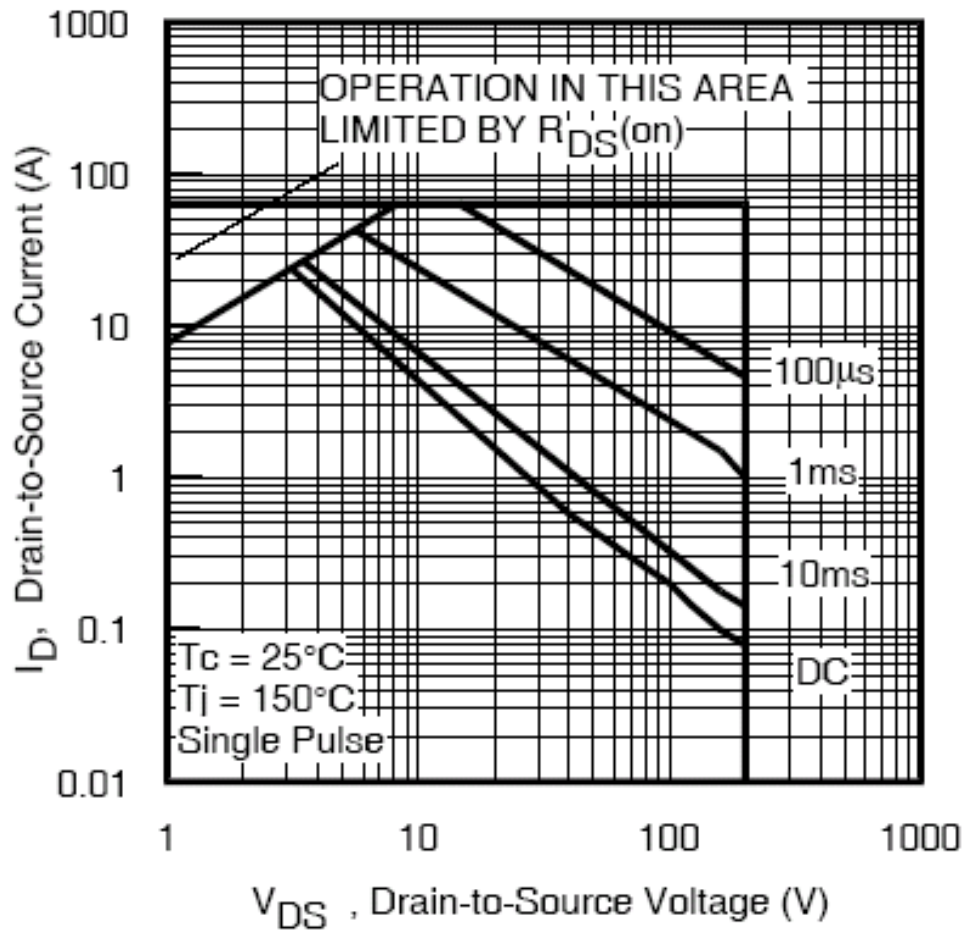
1. The following IR Power MOSFET safe operating area (SOA) curves have been updated with the Direct Current (DC) mode curve.
2. Additional parts SOA curves (with DC characterization) will be updated and maintained in the IR website under the Alerts & Notifications section - <http://www.irf.com/product-info/hi-rel/alerts.html>.

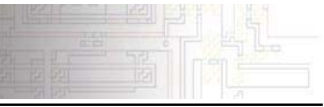
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### **Part numbers contained in this GIDEP amendment include:**

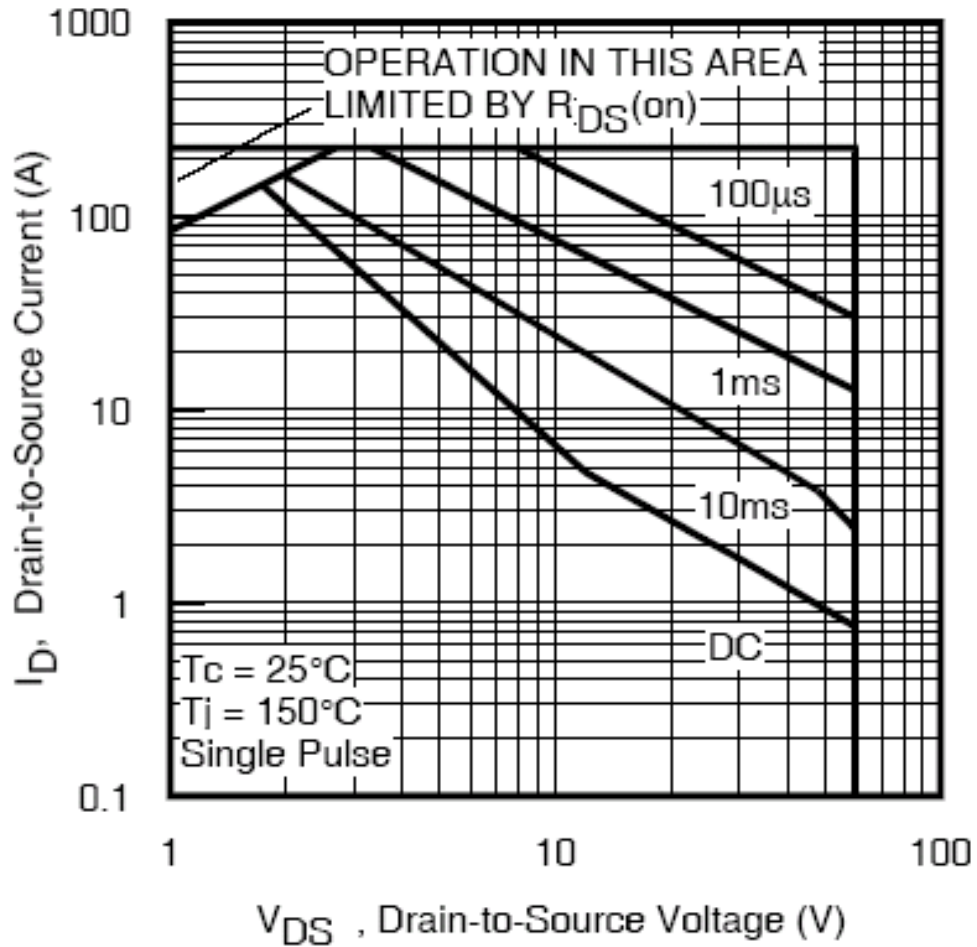
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IRHY57034CM – 2N7483T3	IRHNJ67130 – 2N7587U3
IRHNA57260SE – 2N7473U2	IRHMS67264 – 2N7585T1
IRHNJ597034 – 2N7520U3	IRHLNA797064 – 2N7622U2
IRHLNA77064 – 2N7604U2	IRHMS597260 – 2N7549T1
IRHM9260 – 2N7426	IRHN9250 – 2N7423U

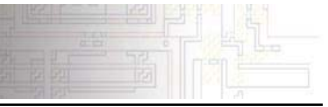
## IRHNJ67230 - SOA CURVE



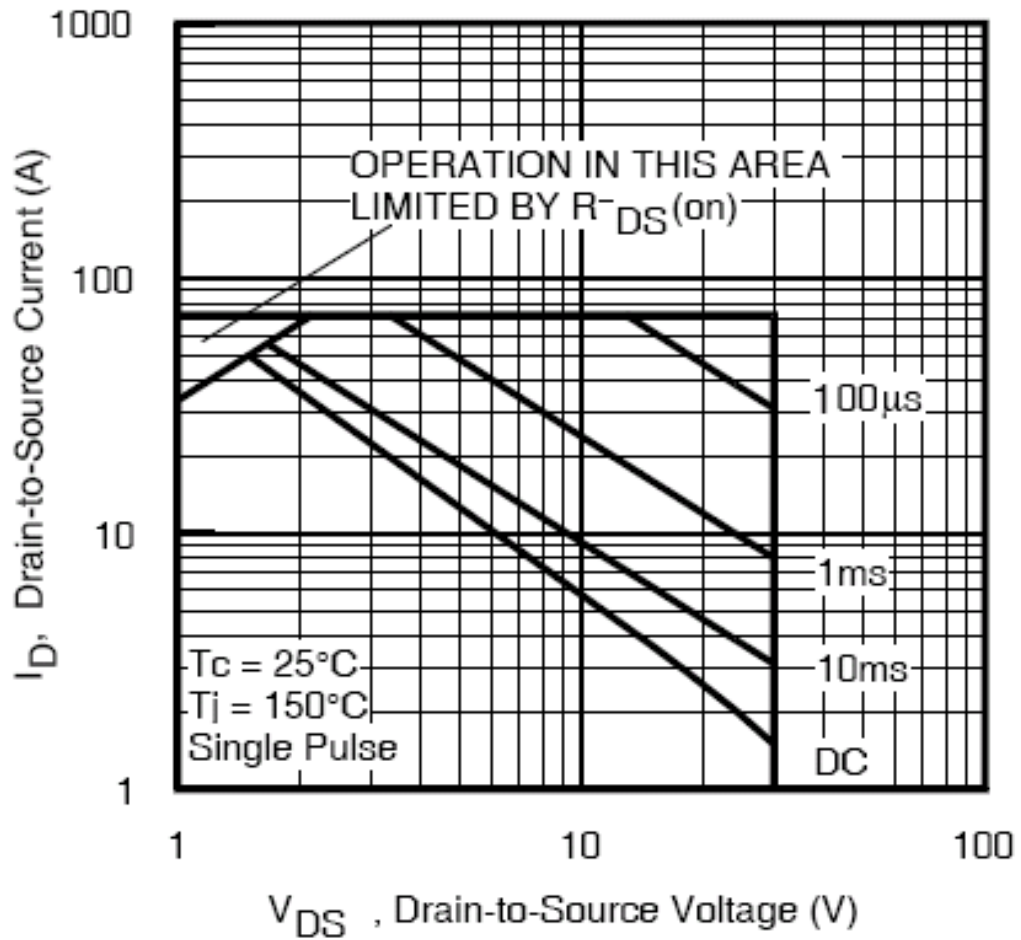


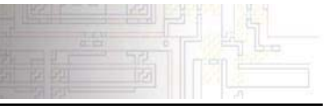
## IRHLNA77064 - SOA CURVE



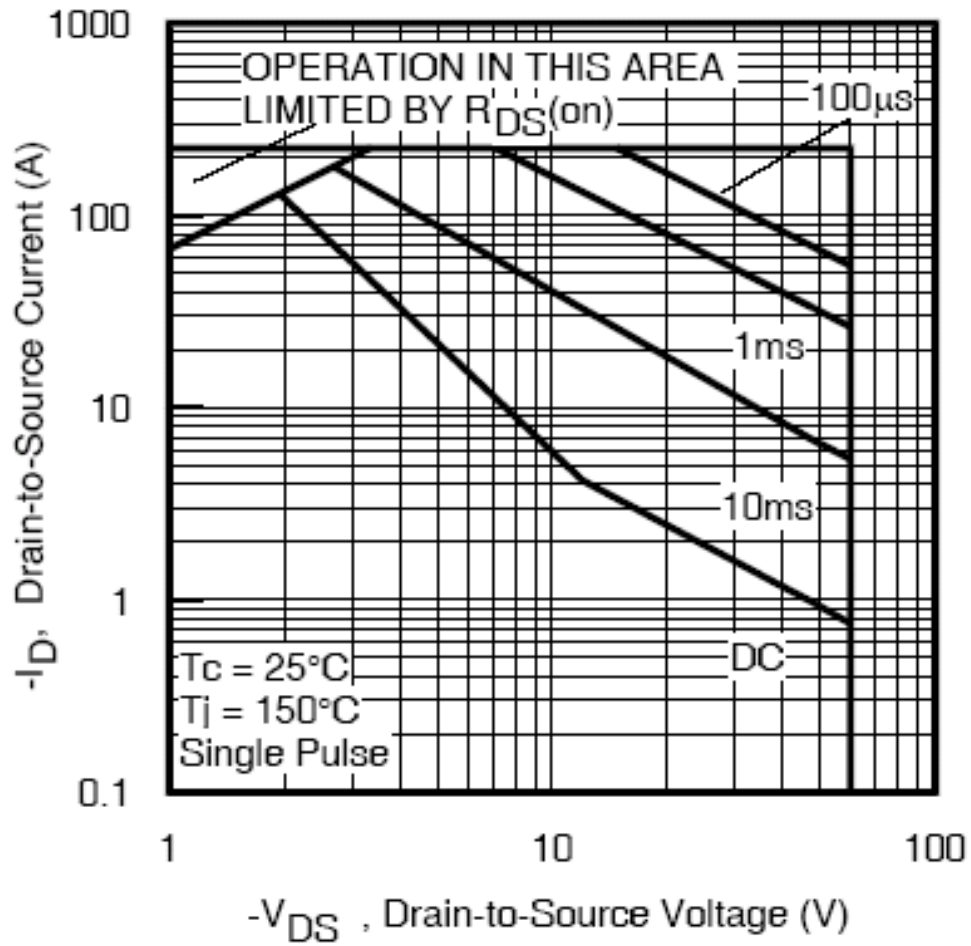


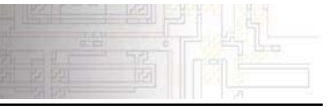
### IRHY57Z30CM - SOA CURVE



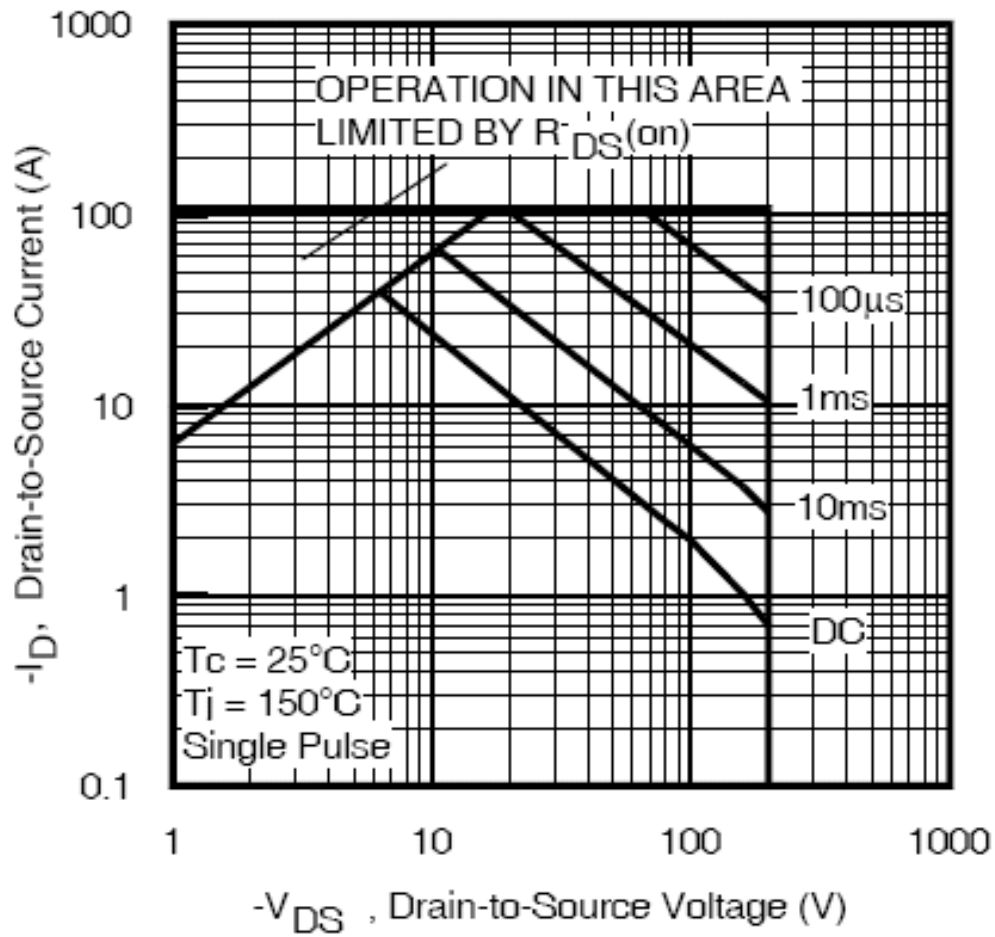


## IRHLNA797064 - SOA CURVE

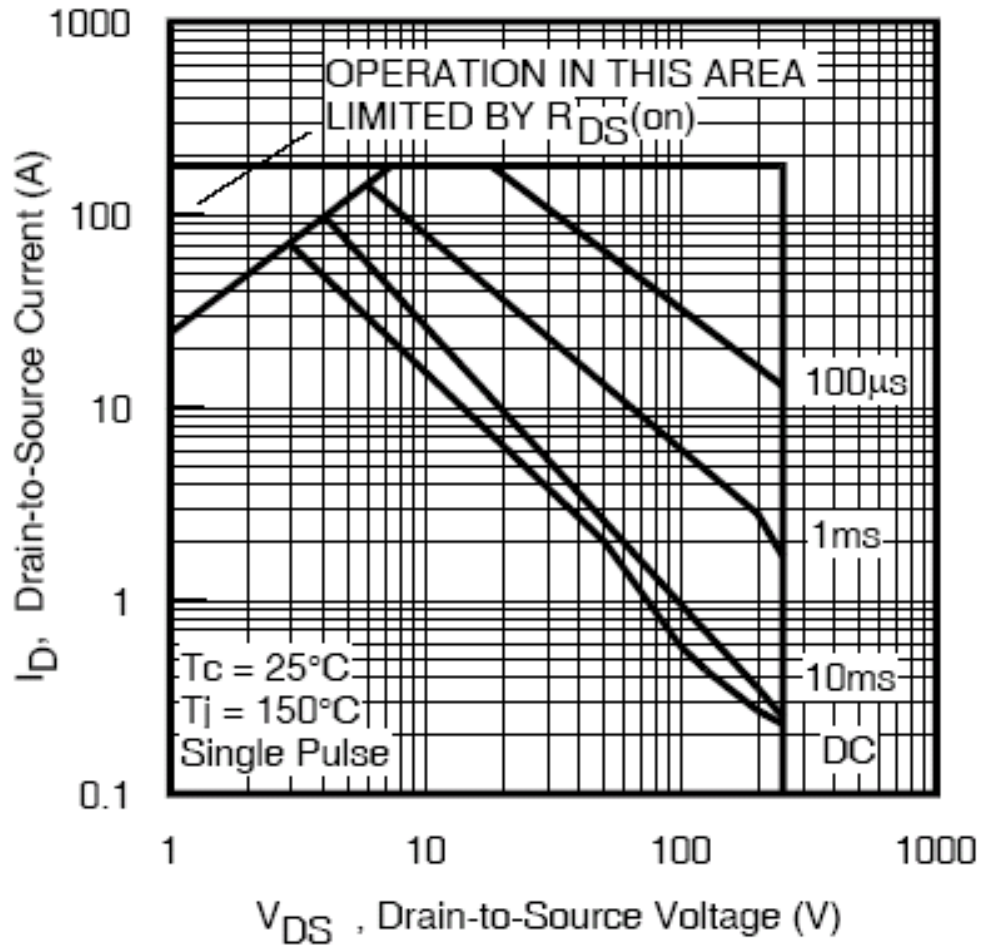




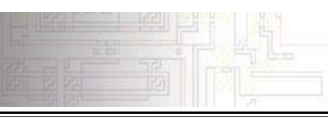
### IRHM9260 - SOA CURVE



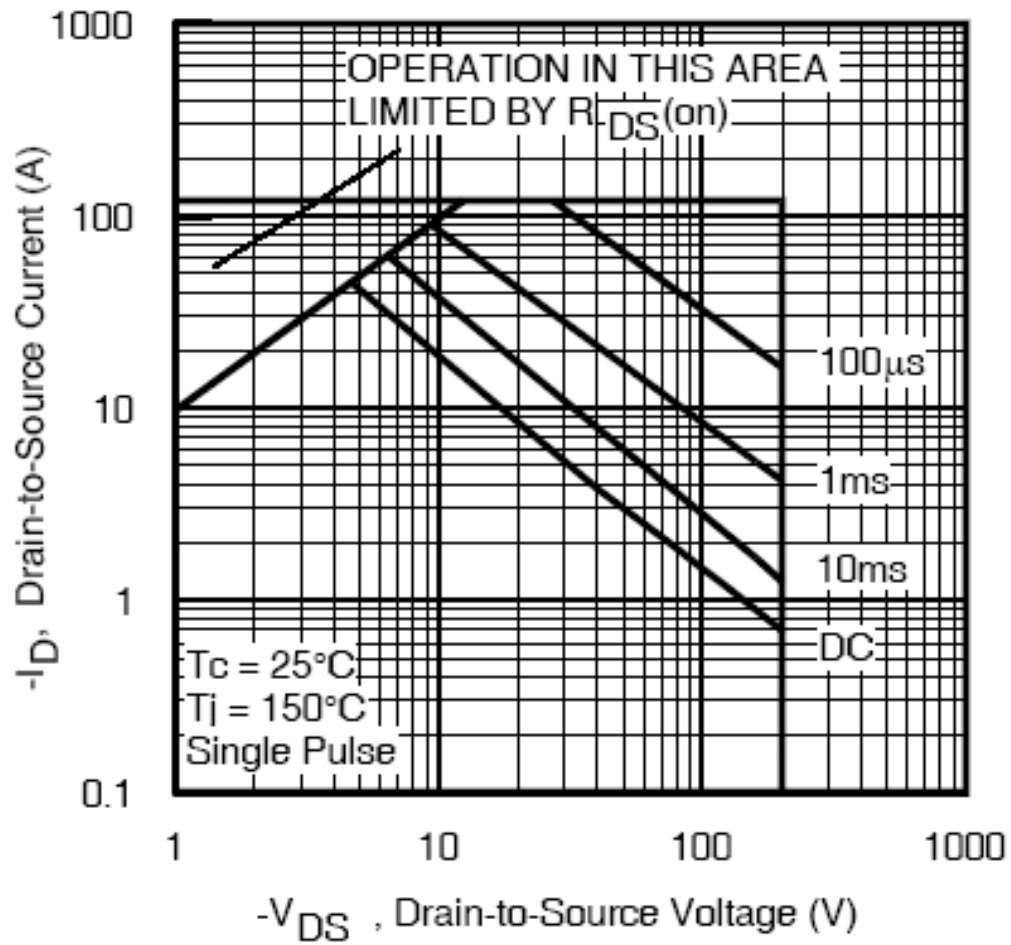
## IRHMS67264 - SOA CURVE

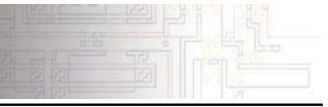




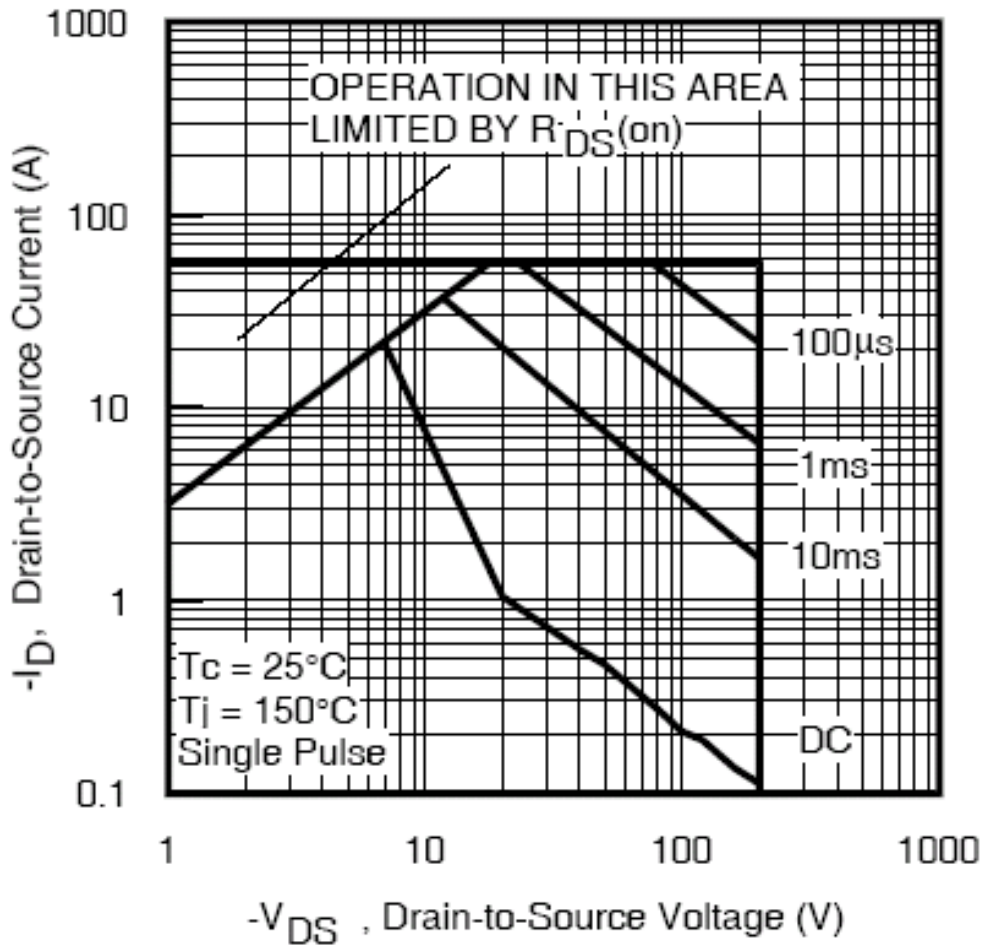


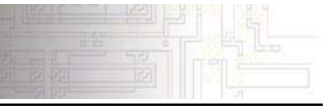
## IRHMS597260 - SOA CURVE



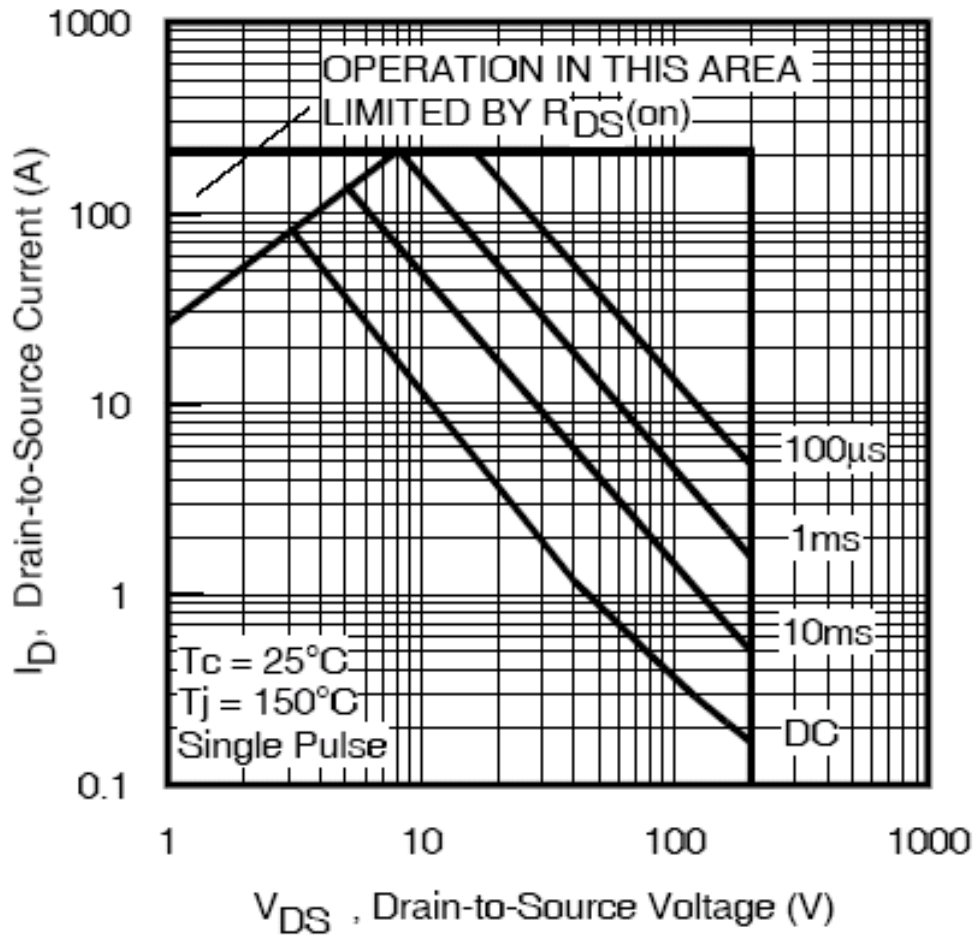


## IRHN9250 - SOA CURVE

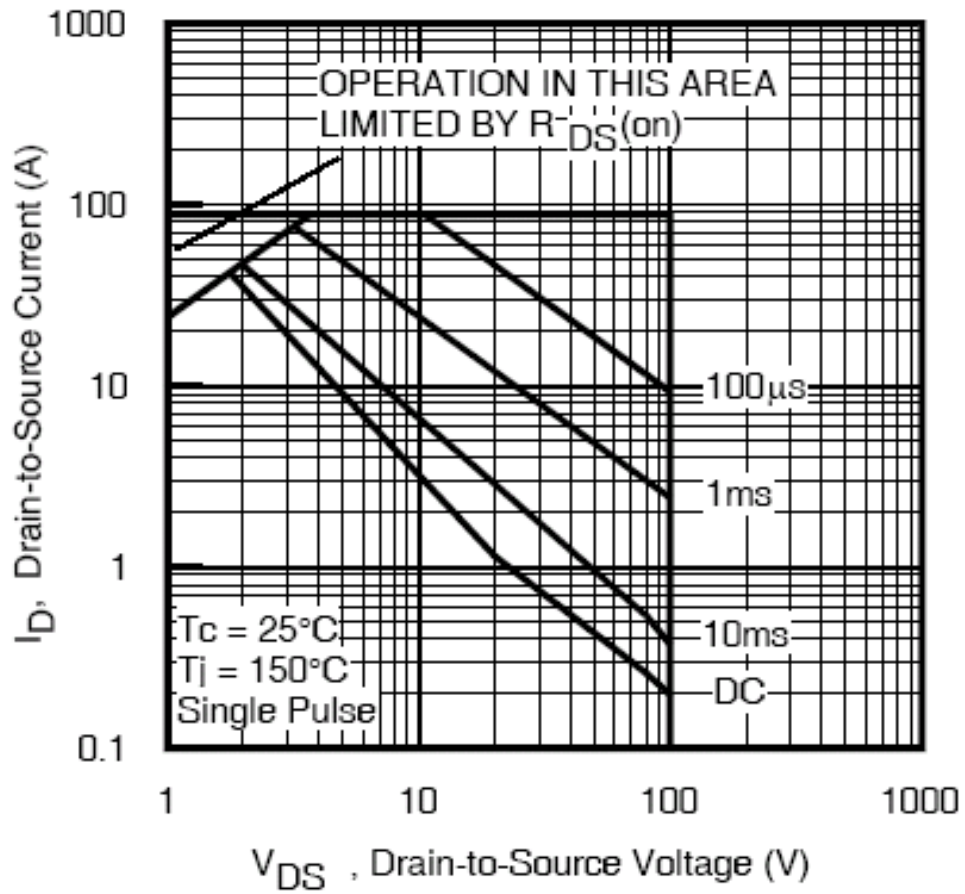


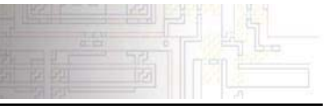


### IRHNA57260SE - SOA CURVE

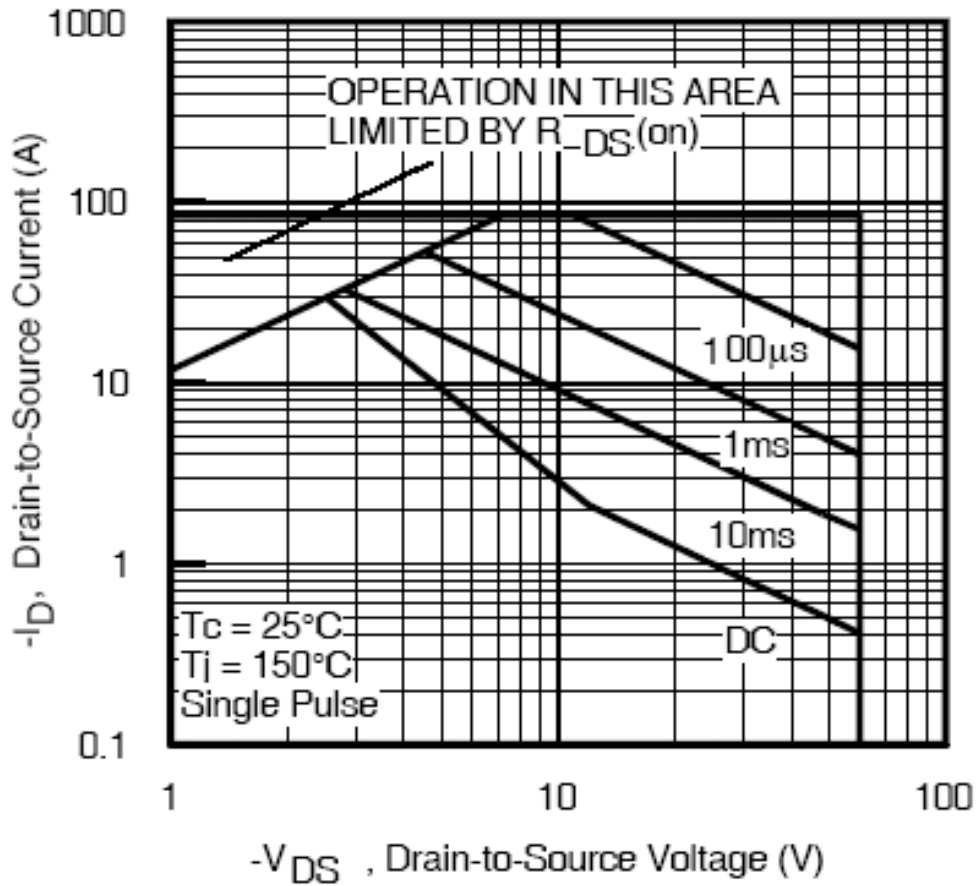


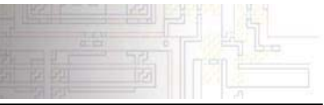
### IRHNJ67130 - SOA CURVE





### IRHNJ597034 - SOA CURVE





## IRHY57034CM - SOA CURVE

