

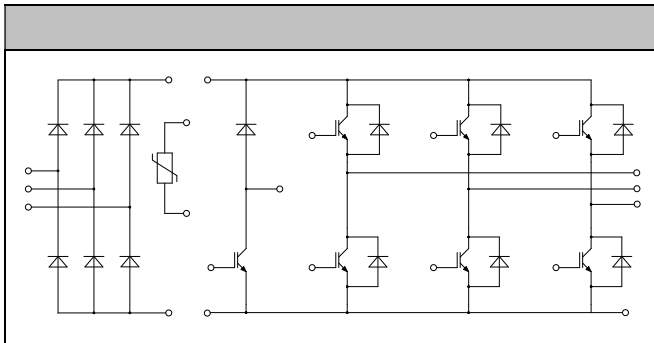


# MG50P12E2



**120V**  
**50A**

**Mitro Dives**  
**AC and DC servo drive amplifier**  
**UPS (Uninterruptible Power Supplies)**



**Low switching losses**  
**Low  $V_{CE(sat)}$  with positive temperature coefficient**  
**Including fast & soft recovery anti-parallel FWD**  
**Low inductance case**  
**High short-circuit capability (10s)**  
**Maximum junction temperature 175°C**

<b>Collector-Emitter Voltage</b>	<b><math>V_{CES}</math></b>	<b><math>V_{CE}=0V, I_C=1mA, T_J=25</math></b>	<b>120</b>	<b>V</b>
<b>Continuous Collector Current</b>	<b><math>I_C</math></b>	<b><math>T_C=100</math> <small><math>v_{jmax}</math></small> <b>175</b></b>	<b>50</b>	<b>A</b>
<b>Repetitive Peak Collector Current</b>	<b><math>I_{CM}</math></b>	<b><math>t_p=1ms</math></b>	<b>100</b>	<b>A</b>
<b>Gate-Emitter Voltage</b>	<b><math>V_{GES}</math></b>	<b><math>T_J=25</math></b>	<b>20</b>	<b>V</b>
<b>Total Power Dissipation</b>	<b><math>P_{tot}</math></b>	<b><math>T_C=25</math> <math>T_{jmax}=175</math></b>	<b>288</b>	<b>W</b>



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<b>Gate-emitter Threshold Voltage</b>	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=17mA, T_j=25$	52	58	64	V	
<b>Collector-Emitter Cut-off Current</b>	$I_{CES}$	$V_{CE}=120V, V_{GE}=0V, T_j=25C$			10	nA	
<b>Collector-Emitter Saturation Voltage</b>	$V_{CE(sat)}$	$I_C=50A, V_{GE}=15V, T_j=25$		190	230	V	
		$I_C=50A, V_{GE}=15V, T_j=125$		220			
		$I_C=50A, V_{GE}=15V, T_j=150$		230			
<b>Gate Charge</b>	$Q_g$			035		$\mu C$	
<b>Input Capacitance</b>	$C_{is}$	$V_{CE}=25V, V_{GE}=0V$		260		rF	
<b>Reverse Transfer Capacitance</b>	$C_{es}$	$f=1MHz, T_j=25C$		010		rF	
<b>Gate-Emitter leakage current</b>	$I_{GES}$	$V_{CE}=0V, V_{GE}=20V, T_j=25$			40	nA	
<b>Turn-on Delay/line</b>	$t_{(on)}$	$I_C=50A$ $V_{CE}=60V$ $V_{GE}=\pm 15V$ $R_G=15$ $T_j=25$		168		ns	
<b>Rise time</b>	$t_r$			31		ns	
<b>Turn-off Delay/line</b>	$t_{(off)}$			30		ns	
<b>Fall time</b>	$t_f$			78		ns	
<b>Energy Dissipation During Turn-on/line</b>	$E_{on}$			542		nJ	
<b>Energy Dissipation During Turn-off/line</b>	$E_{off}$			415		nJ	
<b>Turn-on Delay/line</b>	$t_{(on)}$		$I_C=50A$ $V_{CE}=60V$ $V_{GE}=\pm 15V$ $R_G=15$ $T_j=125$		175		ns
<b>Rise time</b>	$t_r$				42		ns
<b>Turn-off Delay/line</b>	$t_{(off)}$				46		ns
<b>Fall time</b>	$t_f$				148		ns
<b>Energy Dissipation During Turn-on/line</b>	$E_{on}$			726		nJ	
<b>Energy Dissipation During Turn-off/line</b>	$E_{off}$			580		nJ	
<b>SCData</b>	$I_C$	$T_p=10s, V_{GE}=15V, T_j=150, V_{CE}=90V, V_{CEM}=120V$		220		A	

Recovery Charge	$Q_r$	$I_F = 50A$				$\mu C$
Peak Reverse Recovery Current	$I_{RR}$	$V_R = 60V$ $-dI/dt = 150A/\mu s$		5B		A

V
A
A
As

V



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<b>Collector-Emitter Voltage</b>	$V_{CES}$	$V_{CE}=0V, I_C=1mA, T_j=25$	<b>120</b>	<b>V</b>
<b>Continuous Collector Current</b>	$I_C$	$T_C=100$ $v_{max} 175$	<b>35</b>	<b>A</b>
<b>Repetitive Peak Collector Current</b>	$I_{CRM}$	$t_p=1ms$	<b>70</b>	<b>A</b>
<b>Gate-Emitter Voltage</b>	$V_{GES}$	$T_j=25$	<b>20</b>	<b>V</b>
<b>Total Power Dissipation</b>	$P_{tot}$	$T_C=25$ $T_{jmax}=175$	<b>227</b>	<b>W</b>

<b>Gate-emitter Threshold Voltage</b>	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=14mA, T_j=25$	<b>52</b>	<b>58</b>	<b>64</b>	<b>V</b>
<b>Collector-Emitter Cut-off Current</b>	$I_{CES}$	$V_{CE}=120V, V_{GE}=0V, T_j=25C$			<b>10</b>	<b>nA</b>
<b>Collector-Emitter Saturation Voltage</b>	$V_{CE(sat)}$	$I_C=35A, V_{CE}=15V, T_j=25$		<b>185</b>	<b>225</b>	<b>V</b>
		$I_C=35A, V_{CE}=15V, T_j=125$		<b>215</b>		
		$I_C=35A, V_{CE}=15V, T_j=150$		<b>225</b>		
<b>Gate Charge</b>	$Q_g$			<b>027</b>		<b><math>\mu C</math></b>
<b>Input Capacitance</b>	$C_{in}$	$V_{CE}=25V, V_{GE}=0V$		<b>200</b>		<b>rF</b>
<b>Reverse Transfer Capacitance</b>	$C_{tr}$	$f=1MHz, T_j=25C$		<b>007</b>		<b>rF</b>
<b>Gate-Emitter leakage current</b>	$I_{GES}$	$V_{CE}=0V, V_{GE}=20V, T_j=25$			<b>40</b>	<b>nA</b>
<b>Turn-on Delay/line</b>	$t_{on}$	$I_C=35A$ $V_{CE}=60V$ $V_{GE}=\pm 15V$ $R_g=12$ $T_j=25$		<b>25</b>		<b>ns</b>
<b>Rise time</b>	$t_r$			<b>13</b>		<b>ns</b>
<b>Turn-off Delay/line</b>	$t_{off}$			<b>21</b>		<b>ns</b>
<b>Fall time</b>	$t_f$			<b>115</b>		<b>ns</b>
<b>Energy Dissipation During Turn-on</b>	$E_{on}$			<b>190</b>		<b>nJ</b>
<b>Energy Dissipation During Turn-off</b>	$E_{off}$			<b>200</b>		<b>nJ</b>





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<b>Repetitive Peak Reverse Voltage</b>	<b><math>V_{RRM}</math></b>	<b><math>T_J=25</math></b>	<b>160</b>	<b>V</b>
<b>Average Output Current 50kHz, sine wave</b>	<b><math>I_{(AV)}</math></b>	<b><math>T_C=100</math></b>	<b>6</b>	<b>A</b>
<b>Minimum RMS Current at Rectifier Output</b>	<b><math>I_{RSM}</math></b>	<b><math>T_C=100</math></b>	<b>110</b>	<b>A</b>
<b>Surge Forward Current</b>	<b><math>I_{SM}</math></b>	<b><math>V_F=0, t_F=10ms, T_J=25</math></b>	<b>80</b>	<b>A</b>
<b>ft value</b>	<b><math>f_t</math></b>	<b><math>V_F=0, t_F=10ns, T_J=25</math></b>	<b>360</b>	<b>As</b>

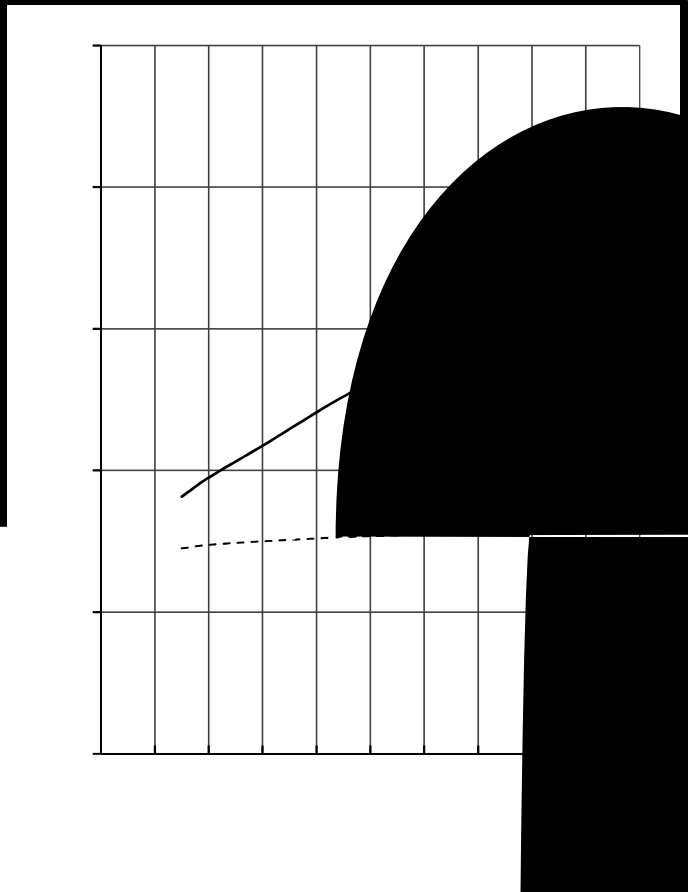
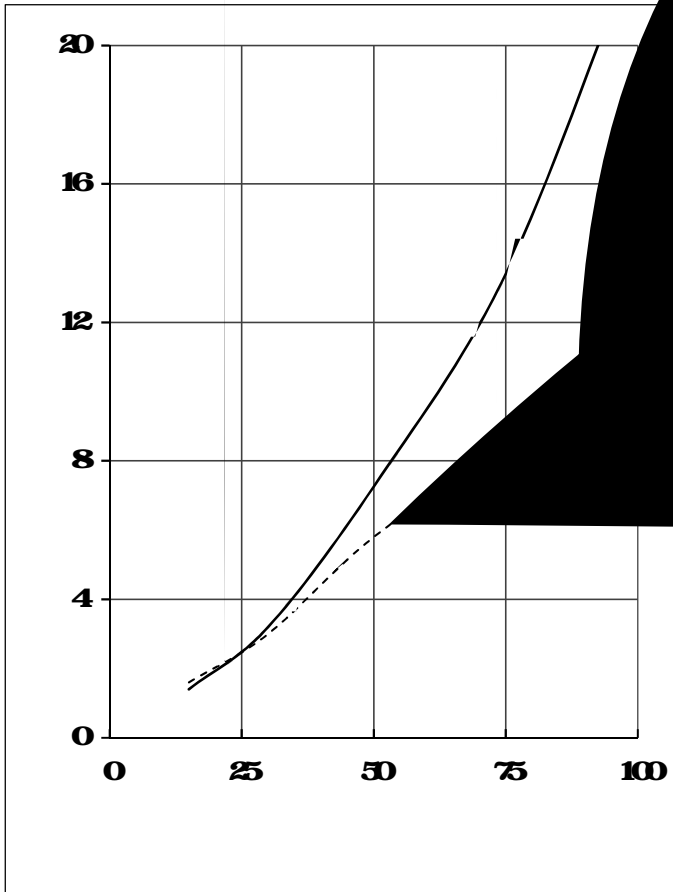
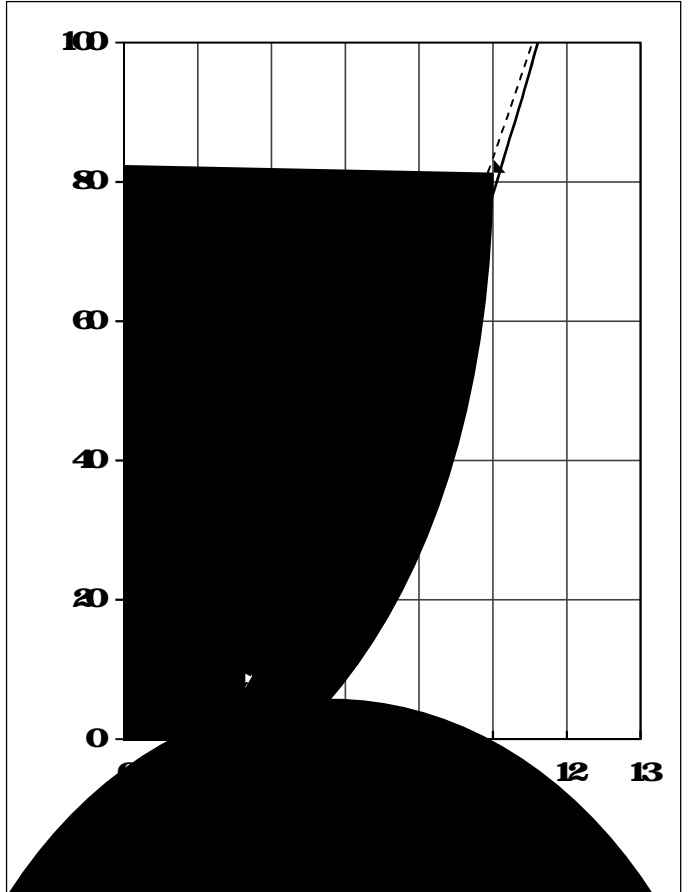
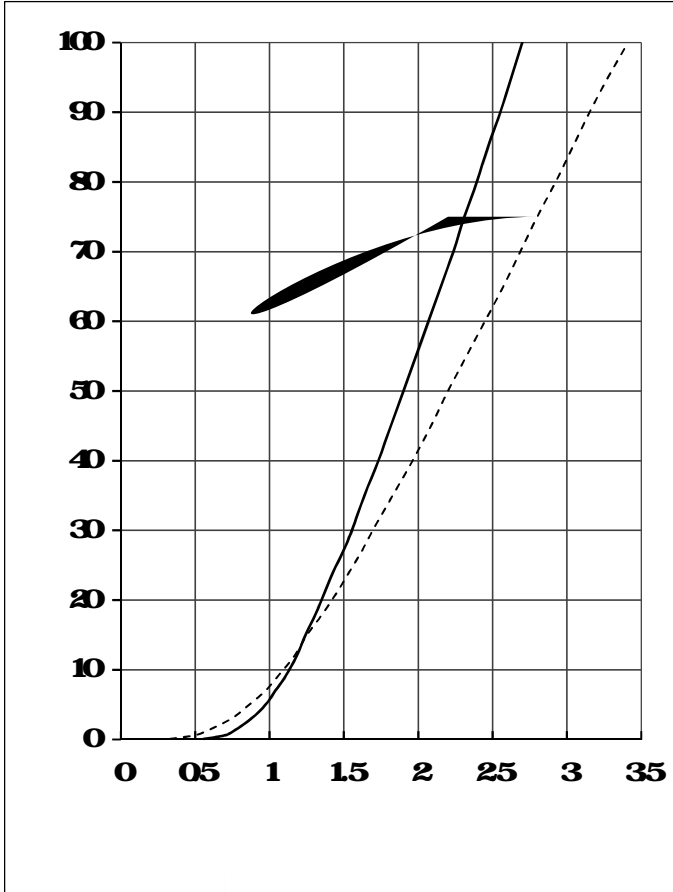
<b>Diode Forward Voltage</b>	<b><math>V_F</math></b>	<b><math>I_F=50A, T_J=125</math></b>	<b>10</b>	<b>V</b>
<b>Reverse Current</b>	<b><math>I_R</math></b>	<b><math>T_J=125, V_R=160V</math></b>	<b>15</b>	<b>nA</b>

<b>Rated Resistance</b>	<b><math>R_Z</math></b>		<b>50</b>	<b>k</b>
<b>Deviation of R10</b>	<b>RR</b>	<b><math>T_C=100, R_{10}=483</math></b>	<b>-5</b>	<b>5</b> %
<b>Power Dissipation</b>	<b><math>P_Z</math></b>			<b>200</b> mW
<b>B value</b>	<b><math>B_{550}</math></b>	<b><math>R_Z = R_{Zexp} P_{Z550} (1/T_C - 1/298.15)</math> <b>[K]</b></b>	<b>335</b>	<b>K</b>



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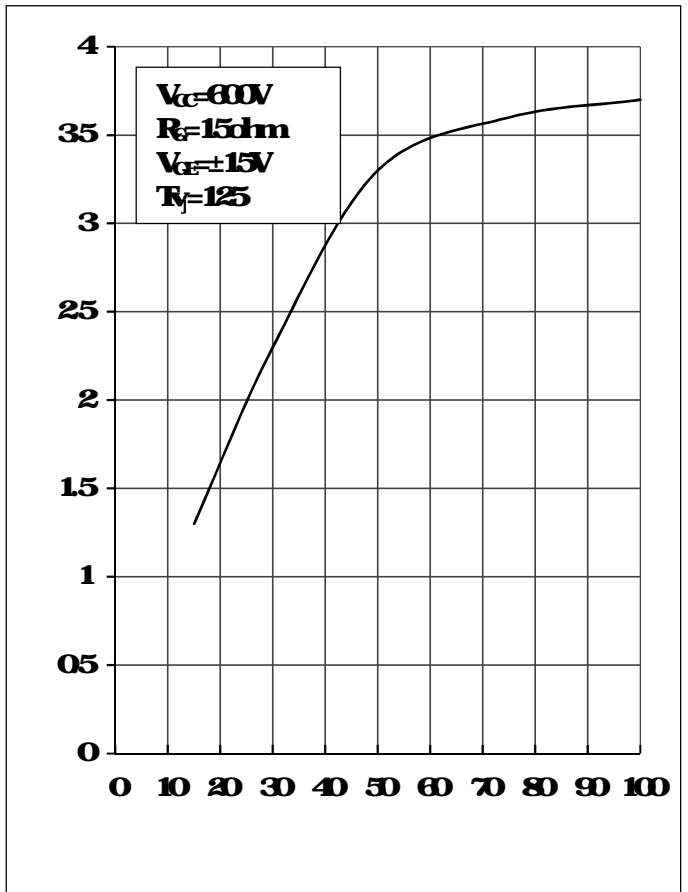
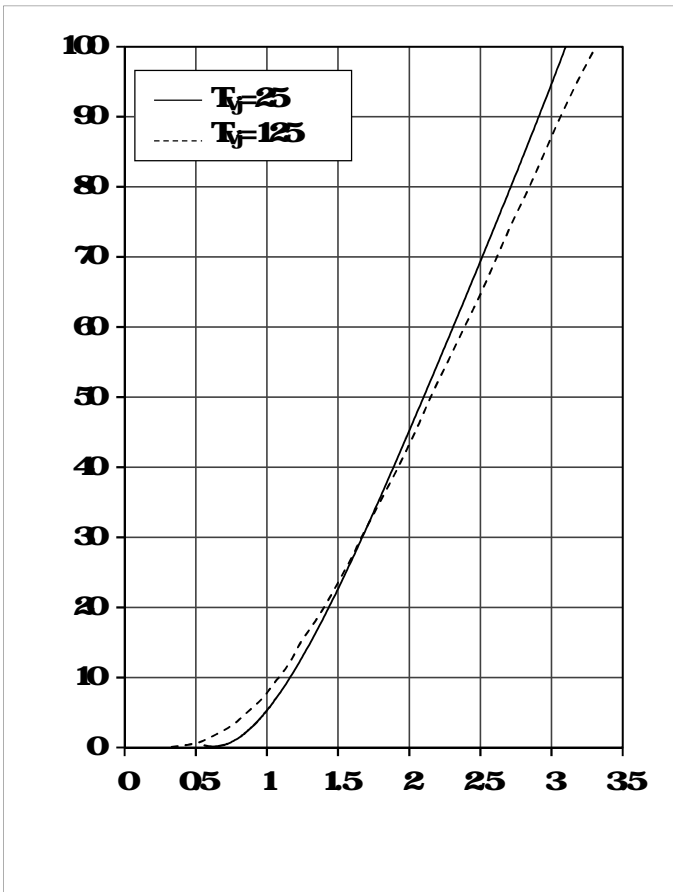
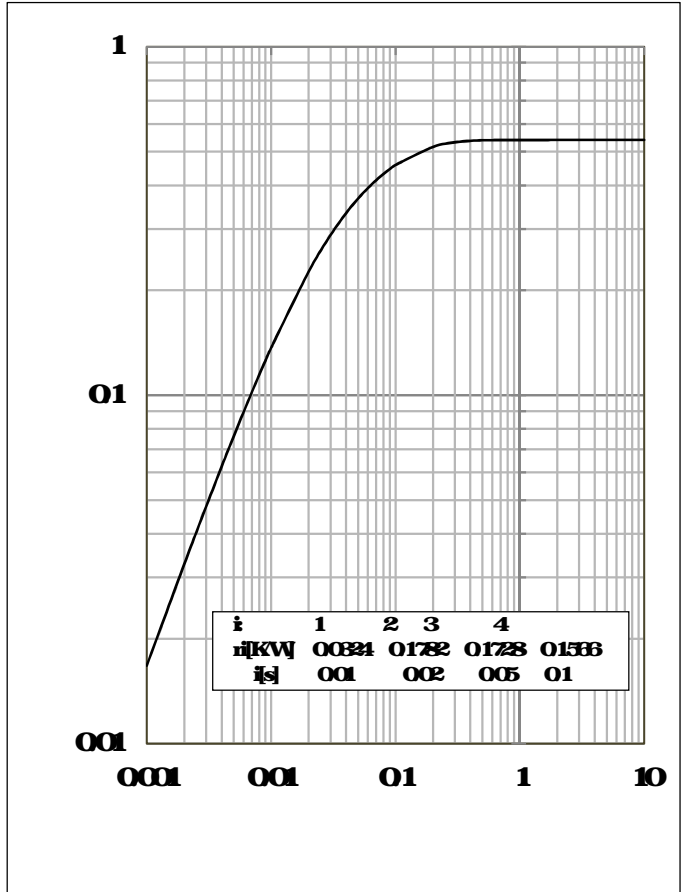
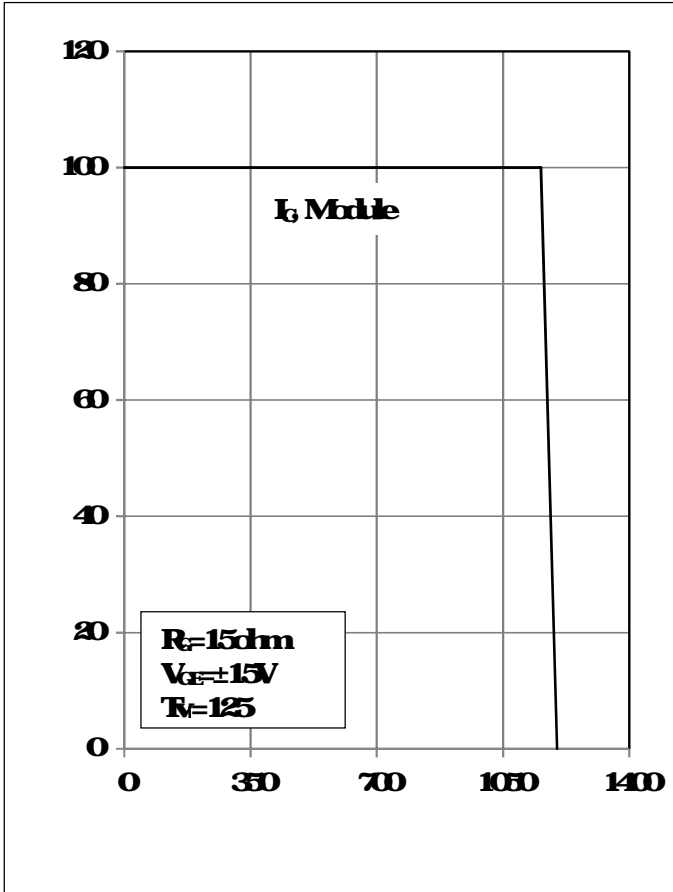
<b>Isd</b>	<b>V<sub>sd</sub></b>	<b>t=1min@50Hz</b>	<b>250</b>			<b>V</b>
<b>Minimum Junction Temperature</b>	<b>T<sub>jsk</sub></b>				<b>15</b>	
<b>Quasi Junction Temperature</b>	<b>T<sub>jq</sub></b>		<b>-40</b>		<b>150</b>	
<b>Storage Temperature</b>	<b>T<sub>stg</sub></b>		<b>-40</b>		<b>125</b>	



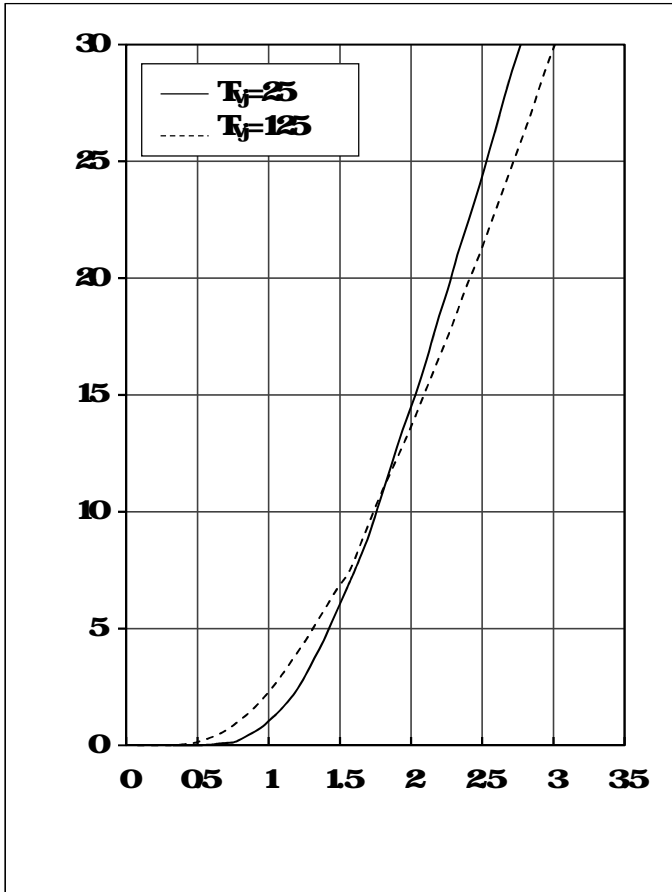


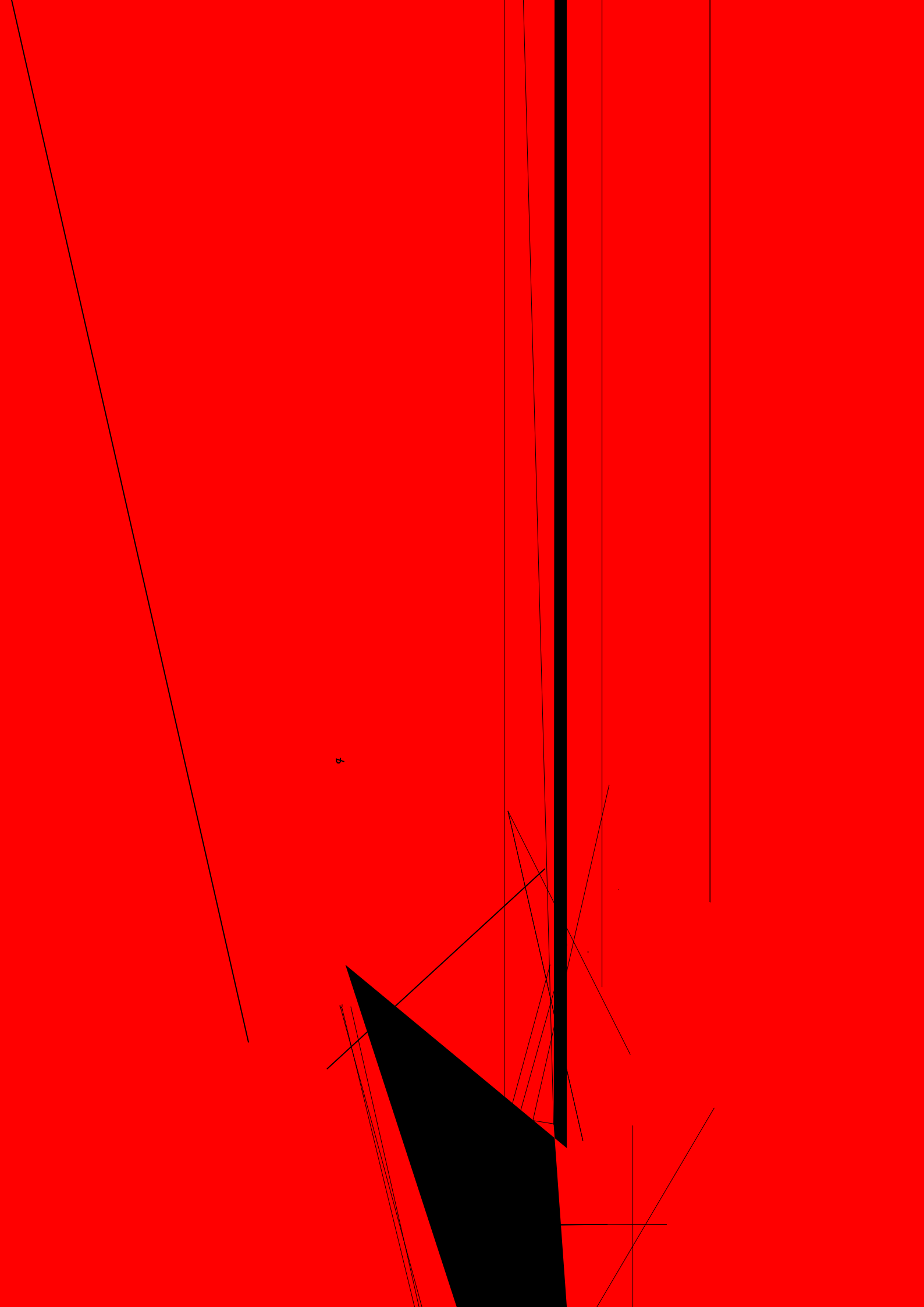


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