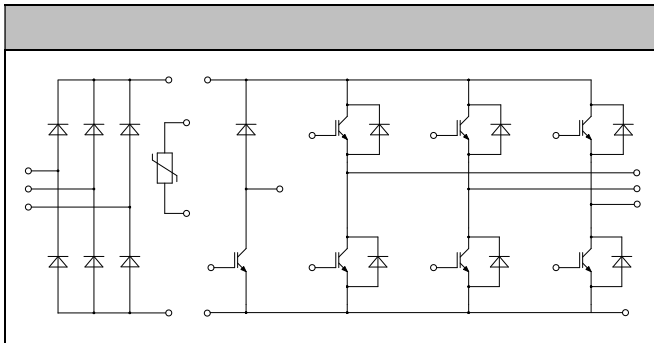




**120V**  
**40A**

- Motor Drives
- AC and DC servo drive amplifier
- UPS (Uninterruptible Power Supplies)



- Low switching losses
- Low  $V_{CE(sat)}$  with positive temperature coefficient
- Inductive 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^\circ C</math></b>	<b>120</b>	<b>V</b>
<b>Continuous Collector Current</b>	<b><math>I_C</math></b>	<b><math>T_C=100^\circ C, T_{Jmax}=175^\circ C</math></b>	<b>40</b>	<b>A</b>
<b>Repetitive Peak Collector Current</b>	<b><math>I_{RM}</math></b>	<b><math>t_p=1ms</math></b>	<b>80</b>	<b>A</b>
<b>Gate-Emitter Voltage</b>	<b><math>V_{GES}</math></b>	<b><math>T_J=25^\circ C</math></b>	<b><math>\pm 20</math></b>	<b>V</b>
<b>Total Power Dissipation</b>	<b><math>P_{tot}</math></b>	<b><math>T_C=25^\circ C</math> <math>T_{Jmax}=175^\circ C</math></b>	<b>227</b>	<b>W</b>

<b>Gate-emitter Threshold Voltage</b>	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=12mA, T_j=25C$	<b>52</b>	<b>60</b>	<b>68</b>	<b>V</b>	
<b>Collector-Emitter Cut-off Current</b>	$I_{CS}$	$V_{CE}=120V, V_{GE}=0V, T_j=25C$			<b>10</b>	<b>nA</b>	
<b>Collector-Emitter Saturation Voltage</b>	$V_{CE(sat)}$	$I_C=4A, V_{GE}=15V, T_j=25C$		<b>190</b>	<b>230</b>	<b>V</b>	
		$I_C=4A, V_{GE}=15V, T_j=125C$		<b>220</b>			
		$I_C=4A, V_{GE}=15V, T_j=150C$		<b>240</b>			
<b>Gate Charge</b>	$Q_g$			<b>035</b>		<b>μC</b>	
<b>Input Capacitance</b>	$C_{is}$	$V_{CE}=25V, V_{GE}=0V$		<b>225</b>		<b>rF</b>	
<b>Reverse Transfer Capacitance</b>	$C_{res}$	$f=1MHz, T_j=25C$		<b>010</b>		<b>rF</b>	
<b>Gate-Emitter leakage current</b>	$I_{GS}$	$V_{CE}=0V, V_{GE}=20V, T_j=25C$			<b>40</b>	<b>nA</b>	
<b>Turn-on Delay/line</b>	$t_{on}$	$I_C=4A$ $V_{CE}=60V$ $V_{GE}=±15V$ $R_θ=13$ $T_j=25C$		<b>18</b>		<b>ns</b>	
<b>Rise time</b>	$t_r$			<b>21</b>		<b>ns</b>	
<b>Turn-off Delay/line</b>	$t_{off}$			<b>30</b>		<b>ns</b>	
<b>Fall time</b>	$t_f$			<b>2</b>		<b>ns</b>	
<b>Energy Dissipation During Turn-on</b>	$E_{on}$			<b>425</b>		<b>nJ</b>	
<b>Energy Dissipation During Turn-off</b>	$E_{off}$			<b>200</b>		<b>nJ</b>	
<b>Turn-on Delay/line</b>	$t_{on}$		$I_C=4A$ $V_{CE}=60V$ $V_{GE}=±15V$ $R_θ=13$ $T_j=125C$		<b>20</b>		<b>ns</b>
<b>Rise time</b>	$t_r$				<b>28</b>		<b>ns</b>
<b>Turn-off Delay/line</b>	$t_{off}$				<b>40</b>		<b>ns</b>
<b>Fall time</b>	$t_f$				<b>9</b>		<b>ns</b>
<b>Energy Dissipation During Turn-on</b>	$E_{on}$			<b>604</b>		<b>nJ</b>	
<b>Energy Dissipation During Turn-off</b>	$E_{off}$			<b>305</b>		<b>nJ</b>	
<b>SCData</b>	$I_C$	$T_p=10s, V_{GE}=15V, T_j=150C,$ $V_{CE}=90V, V_{CEM}=120V$		<b>200</b>		<b>A</b>	



<b>Repetitive Peak Reverse Voltage</b>	<b>V<sub>RM</sub></b>	<b>T<sub>j</sub>=25°C</b>	<b>120</b>	<b>V</b>
<b>Continuous DC Forward Current</b>	<b>I<sub>F</sub></b>		<b>40</b>	<b>A</b>
<b>Repetitive Peak Forward Current</b>	<b>I<sub>RM</sub></b>	<b>t<sub>p</sub>=1ms</b>	<b>80</b>	<b>A</b>
<b>Reverse</b>	<b>R<sub>θ</sub></b>	<b>V<sub>r</sub>=0, t<sub>p</sub>=10ms, T<sub>j</sub>=125°C</b>	<b>20</b>	<b>ns</b>
		<b>V<sub>r</sub>=0, t<sub>p</sub>=10ms, T<sub>j</sub>=150°C</b>	<b>20</b>	

<b>Forward Voltage</b>	<b>V<sub>F</sub></b>	<b>I<sub>F</sub>=40A, T<sub>j</sub>=25°C</b>	<b>190</b>	<b>225</b>	<b>V</b>
		<b>I<sub>F</sub>=40A, T<sub>j</sub>=125°C</b>	<b>190</b>		
		<b>I<sub>F</sub>=40A, T<sub>j</sub>=150°C</b>	<b>185</b>		
<b>Recovered Charge</b>	<b>Q<sub>r</sub></b>	<b>I<sub>F</sub>=40A</b>	<b>415</b>		<b>μC</b>
<b>Peak Reverse Recovery Current</b>	<b>I<sub>r</sub></b>	<b>V<sub>r</sub>=60V</b> <b>-d<sub>i</sub>/d<sub>t</sub>=160A/μs</b>	<b>42</b>		<b>A</b>
<b>Reverse Recovery Energy</b>	<b>E<sub>rec</sub></b>	<b>T<sub>j</sub>=25°C</b>	<b>130</b>		<b>nJ</b>
<b>Recovered Charge</b>	<b>Q<sub>r</sub></b>	<b>I<sub>F</sub>=40A</b>	<b>800</b>		<b>μC</b>
		<b>V<sub>r</sub>=60V</b> <b>-d<sub>i</sub>/d<sub>t</sub>=160A/μs</b>	<b>46</b>		<b>A</b>
		<b>T<sub>j</sub>=125°C</b>	<b>23</b>		<b>nJ</b>



<b>Collector-Emitter Voltage</b>	$V_{CES}$	$V_{GE}=0V, I_C=1mA, T_j=25C$	<b>120</b>	<b>V</b>
<b>Continuous Collector Current</b>	$I_C$	$T_C=100C, T_{jmax}=175C$	<b>25</b>	<b>A</b>
<b>Repetitive Peak Collector Current</b>	$I_{CRM}$	$t_p=1ms$	<b>50</b>	<b>A</b>
<b>Gate-Emitter Voltage</b>	$V_{GES}$	$T_j=25C$	$\pm 20$	<b>V</b>
<b>Total Power Dissipation</b>	$P_{tot}$	$T_C=25C$ $T_{jmax}=175C$	<b>166</b>	<b>W</b>

<b>Gate-emitter Threshold Voltage</b>	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=12mA, T_j=25C$	<b>52</b>	<b>60</b>	<b>68</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>	$V_{CE(sat)}$	$I_C=25A, V_{GE}=15V, T_j=25C$		<b>190</b>	<b>230</b>	<b>V</b>
		$I_C=25A, V_{GE}=15V, T_j=125C$		<b>220</b>		
		$I_C=25A, V_{GE}=15V, T_j=150C$		<b>230</b>		
<b>Gate Charge</b>	$Q_g$			<b>021</b>		<b><math>\mu C</math></b>
<b>Input Capacitance</b>	$C_{iss}$	$V_{CE}=25V, V_{GE}=0V$		<b>160</b>		<b>pF</b>
<b>Reverse Transfer Capacitance</b>	$C_{res}$	$f=1MHz, T_j=25C$		<b>007</b>		<b>pF</b>
<b>Gate-Emitter Leakage current</b>	$I_{GES}$	$V_{GE}=0V, V_{CE}=20V, T_j=25C$			<b>100</b>	<b>nA</b>
<b>Turn-on Delay/line</b>	$t_{(on)}$	$I_C=25A$ $V_{CE}=60V$ $V_{GE}=\pm 15V$ $R_{\theta} = 18$ $T_j=25C$		<b>175</b>		<b>ns</b>
<b>Rise time</b>	$t_r$			<b>38</b>		<b>ns</b>
<b>Turn-off Delay/line</b>	$t_{(off)}$			<b>40</b>		<b>ns</b>
<b>Fall time</b>	$t_f$			<b>65</b>		<b>ns</b>
<b>Energy Dissipation During Turn-on/line</b>	$E_{on}$			<b>195</b>		<b>nJ</b>
<b>Energy Dissipation During Turn-off/line</b>	$E_{off}$			<b>120</b>		<b>nJ</b>



**Function/line**

**(a)**

**1**

**2**

**m**

**$I_C = 25A$**

**$V_{CE} = 60V$**

**$V_{GE} = \pm 15V$**

**$R_G = 18$**

**$T_J = 125C$**



<b>Repetitive Peak Reverse Voltage</b>	<b><math>V_{RRM}</math></b>	<b><math>T_J=25^{\circ}C</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^{\circ}C</math></b>	<b>50</b>	<b>A</b>
<b>Minimum RMS Current at Rectifier Output</b>	<b><math>I_{RSM}</math></b>	<b><math>T_C=100^{\circ}C</math></b>	<b>60</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=45^{\circ}C</math></b>	<b>300</b>	<b>A</b>
<b>Reverse Recovery Time</b>	<b><math>t_r</math></b>	<b><math>V_F=0, t_F=10ms, T_J=45^{\circ}C</math></b>	<b>500</b>	<b>ns</b>

<b>Diode Forward Voltage</b>	<b><math>V_F</math></b>	<b><math>I_F=40A, T_J=125^{\circ}C</math></b>	<b>112</b>	<b>V</b>
<b>Reverse Current</b>	<b><math>I_R</math></b>	<b><math>T_J=125^{\circ}C, V_R=160V</math></b>	<b>20</b>	<b>mA</b>

<b>Rated Resistance</b>	<b><math>R_{\theta}</math></b>		<b>50</b>	<b>k<math>\Omega</math></b>
<b>Deviation of R100</b>	<b>RR</b>	<b><math>T_C=100^{\circ}C, R_{100}=483^{\circ}</math></b>	<b>-5</b>	<b>5</b> %
<b>Power Dissipation</b>	<b><math>P_{\theta}</math></b>			<b>200</b> mW
<b>B value</b>	<b><math>B_{500}</math></b>	<b><math>R_{\theta} = R_{\theta} \exp(B_{500} / (T_C - 125))</math></b>	<b>335</b>	<b>K</b>



<b>Isolation Voltage</b>	<b>V<sub>sd</sub></b>	<b>t=1min, f=50Hz</b>	<b>250</b>			<b>V</b>
<b>Minimum Junction Temperature</b>	<b>T<sub>junction</sub></b>				<b>175</b>	<b>°C</b>
<b>Operating Junction Temperature</b>	<b>T<sub>jqop</sub></b>		<b>-40</b>		<b>150</b>	<b>°C</b>
<b>Storage Temperature</b>	<b>T<sub>stg</sub></b>		<b>-40</b>		<b>125</b>	<b>°C</b>
<b>Stray inductance</b>	<b>L<sub>sce</sub></b>			<b>60</b>		<b>nH</b>
<b>Miller lead resistance, terminals dip</b>	<b>R<sub>CEE</sub></b>	<b>T<sub>c</sub>=25°C, per switch</b>		<b>40</b>		<b>mΩ</b>
	<b>R<sub>MLCC</sub></b>			<b>30</b>		
<b>Thermal Resistance Junction to Case</b>	<b>R<sub>JC</sub></b>	<b>per GBF in ether</b>			<b>066</b>	<b>KW</b>
		<b>per Dole in ether</b>			<b>100</b>	
		<b>per GBF bare copper</b>			<b>090</b>	
		<b>per Dole copper</b>			<b>150</b>	
		<b>per Dole solder</b>			<b>075</b>	
<b>Thermal Resistance Case to Sink</b>	<b>R<sub>CS</sub></b>	<b>per GBF in ether</b>		<b>031</b>		<b>KW</b>
		<b>per Dole in ether</b>		<b>048</b>		
		<b>per GBF bare copper</b>		<b>033</b>		
		<b>per Dole copper</b>		<b>070</b>		
		<b>per Dole solder</b>		<b>036</b>		
		<b>per Middle</b>		<b>002</b>		
<b>Mating Force Per Clamp</b>	<b>F</b>		<b>30</b>		<b>60</b>	<b>N</b>
<b>Weight of Module</b>	<b>G</b>			<b>180</b>		<b>g</b>

