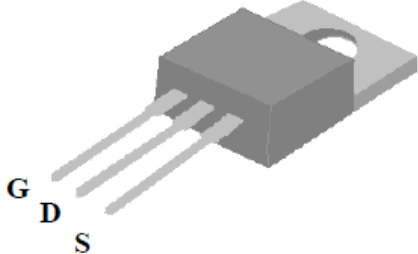
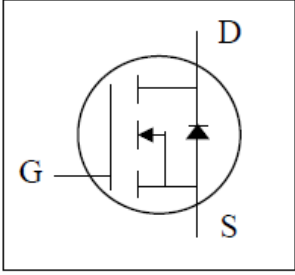



<p style="text-align: center;"><u>TO-220AB</u></p>   <table border="1" data-bbox="219 1066 738 1255"> <thead> <tr> <th colspan="2">Primary Characteristics</th> </tr> </thead> <tbody> <tr> <td>BV_{DSS}</td> <td>200V</td> </tr> <tr> <td>$R_{DS(ON)}$</td> <td>400mΩ</td> </tr> <tr> <td>I_D</td> <td>9A</td> </tr> </tbody> </table>	Primary Characteristics		BV_{DSS}	200V	$R_{DS(ON)}$	400m Ω	I_D	9A	<table border="1"> <thead> <tr> <th>Features</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> Dynamic dv/dt Rating Repetitive Avalanche Rated Fast Switching Simple Drive Requirement </td> </tr> </tbody> </table> <div style="text-align: right;">  </div> <table border="1"> <thead> <tr> <th>General Description</th> </tr> </thead> <tbody> <tr> <td>SiPower provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Applications</th> </tr> </thead> <tbody> <tr> <td>The TO-220AB package is universally preferred for all commercial industrial applications at power dissipation levels to approximately 50watts.</td> </tr> </tbody> </table>	Features	<ul style="list-style-type: none"> Dynamic dv/dt Rating Repetitive Avalanche Rated Fast Switching Simple Drive Requirement 	General Description	SiPower provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.	Applications	The TO-220AB package is universally preferred for all commercial industrial applications at power dissipation levels to approximately 50watts.
Primary Characteristics															
BV_{DSS}	200V														
$R_{DS(ON)}$	400m Ω														
I_D	9A														
Features															
<ul style="list-style-type: none"> Dynamic dv/dt Rating Repetitive Avalanche Rated Fast Switching Simple Drive Requirement 															
General Description															
SiPower provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.															
Applications															
The TO-220AB package is universally preferred for all commercial industrial applications at power dissipation levels to approximately 50watts.															
Absolute Maximum Ratings															
Parameter	Symbol	Rating	Unit												
Drain-Source Voltage	V_{DS}	200	V												
Gate-Source Voltage	V_{GS}	± 30	V												
Continuous Drain Current, V_{GS} @ 10V	$I_D@T_C=25^\circ C$	9	A												
Continuous Drain Current, V_{GS} @ 10V	$I_D@T_C=100^\circ C$	5.7	A												
Pulsed Drain Current ¹	I_{DM}	36	A												
Total Power Dissipation	$P_D@T_C=25^\circ C$	74	W												
Linear Derating Factor		0.59	W/ $^\circ C$												
Single Pulse Avalanche Energy ²	E_{AS}	240	mJ												
Avalanche Current	I_{AR}	9	A												
Repetitive Avalanche Energy	E_{AR}	7	mJ												
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ C$												
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ C$												

Thermal Data			
Parameter	Symbol	Value	Unit
Maximum Thermal Resistance, Junction-case	Rthj-c	1.7	°C/W
Maximum Thermal Resistance, Junction-ambient	Rthj-a	62	°C/W

Electrical Characteristics@Tj=25°C(unless otherwise specified)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	200	-	-	V
Breakdown Voltage Temp. Coefficient	$\Delta BV_{DSS}/\Delta T_j$	Reference to 25 °C, I _b =1mA	-	0.248	-	V/°C
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =5A	-	-	400	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2	-	4	V
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =5A	-	40	-	S
Drain-Source Leakage Current (Tj=25 °C)	I _{DSS}	V _{DS} =200V, V _{GS} =0V	-	-	10	uA
Drain-Source Leakage Current (Tj=150 °C)		V _{DS} =160V, V _{GS} =0V	-	-	100	uA
Gate-Source Leakage	I _{GSS}	V _{GS} =±30V	-	-	±100	nA
Total Gate Charge ³	Q _g	I _D =9A	-	25	-	nC
Gate-Source Charge	Q _{gs}	V _{DS} =160V	-	3.6	-	nC
Gate-Drain ("Miller") Charge	Q _{gd}	V _{GS} =10V	-	14	-	nC
Turn-on Delay Time ³	t _{d(on)}	V _{DD} =100V	-	8	-	ns
Rise Time	t _r	I _D =9A	-	26	-	ns
Turn-off Delay Time	t _{d(off)}	R _G =10Ω, V _{GS} =10V	-	34	-	ns
Fall Time	t _f	R _D =11Ω	-	22	-	ns
Input Capacitance	C _{iss}	V _{GS} =0V	-	515	-	pF
Output Capacitance	C _{oss}	V _{DS} =25V	-	90	-	pF
Reverse Transfer Capacitance	C _{rss}	f=1.0MHz	-	40	-	pF

Source-Drain Diode						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Continuous Source Current (Body Diode)	I _S	V _D =V _G =0V , V _S =1.3V	-	-	9	A
Pulsed Source Current (Body Diode) ¹	I _{SM}		-	-	36	A
Forward On Voltage ³	V _{SD}	Tj=25 °C, I _S =9A, V _{GS} =0V	-	-	1.3	V

Notes:

1. Pulse width limited by safe operating area.
2. Starting Tj=25°C, V_{DD}=50V , L=4.5mH , R_G=25Ω, I_{AS}=9A
3. Pulse width <300us, duty cycle <2%.

Typical Characteristics Curve

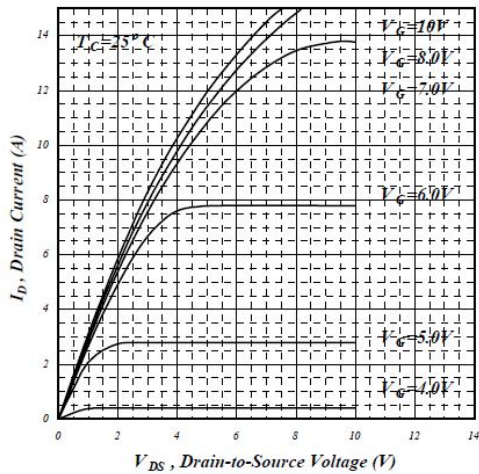


Figure 1. Typical Output Characteristics

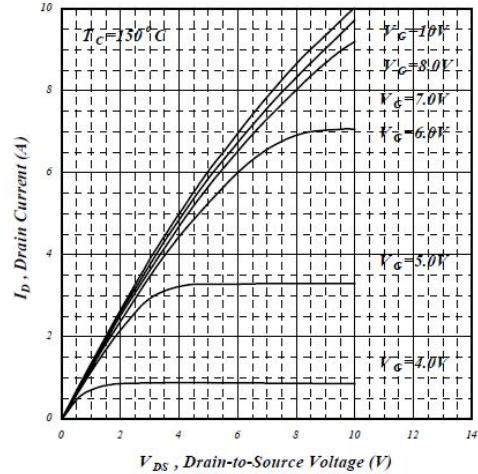


Figure 2. Typical Output Characteristics

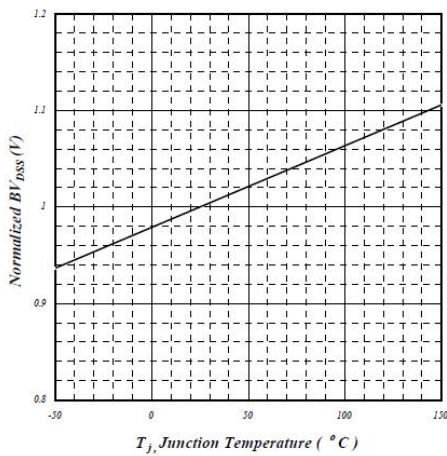


Figure 3. Normalized BVDSS v.s. Junction Temperature

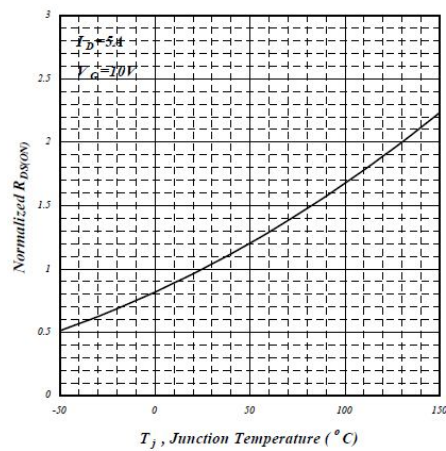


Figure 4. Normalized On-Resistance v.s. Junction Temperature

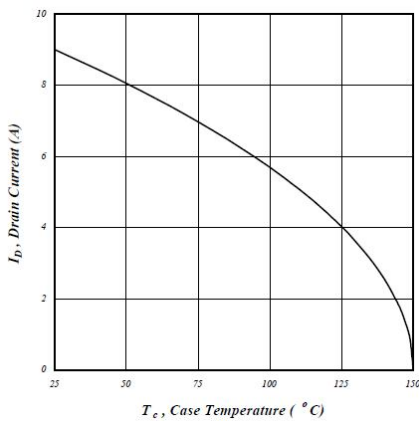


Figure 5. Maximum Drain Current v.s. Case Temperature

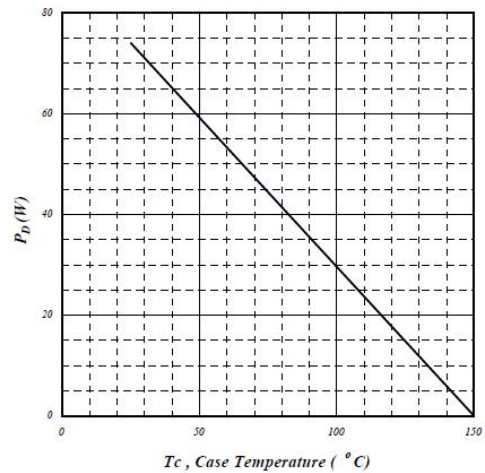


Figure 6. Typical Power Dissipation

Typical Characteristics Curve

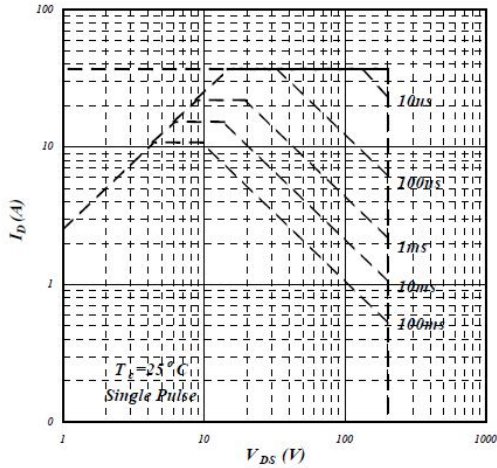


Figure 7. Maximum Safe Operating

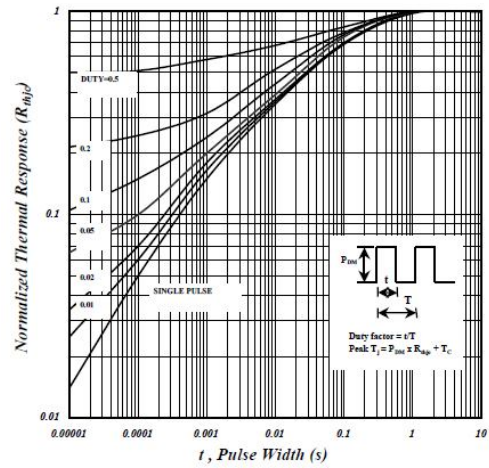


Figure 8. Effective Transient Thermal Impedance

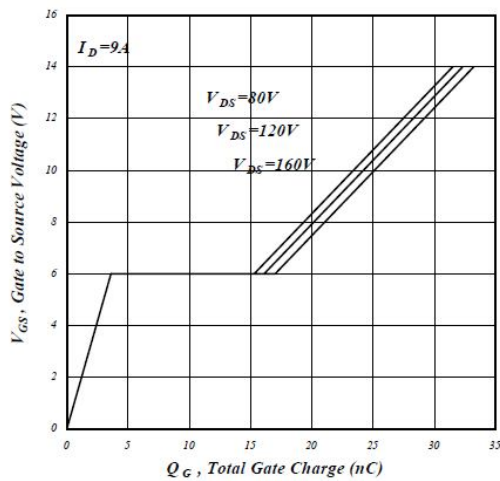


Figure 9. Gate Charge Characteristics

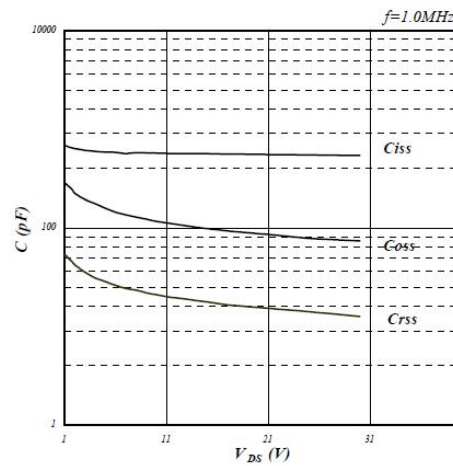


Figure 10. Typical Capacitance Characteristics

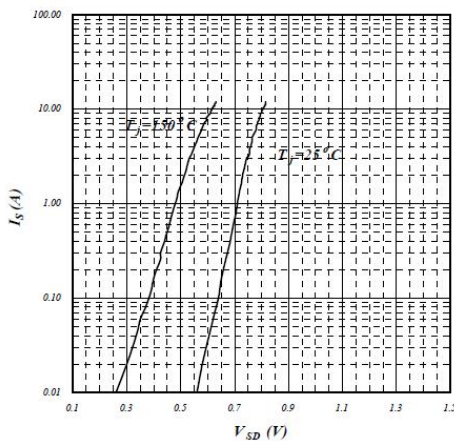


Figure 11. Forward Characteristic of Reverse Diode

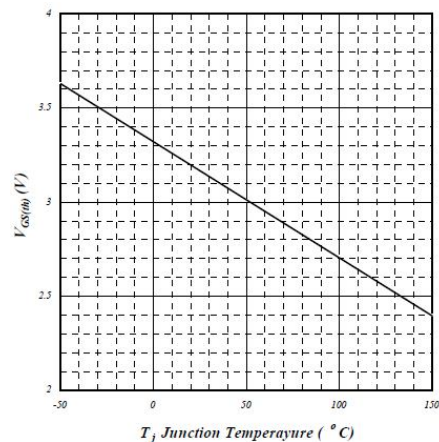
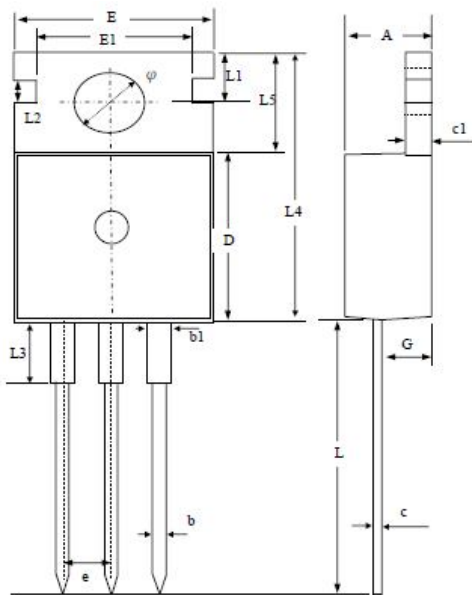


Figure 12. Gate Threshold Voltage v.s. Junction Temperature

Note

This product is sensitive to electrostatic discharge, please handle with caution. Use of this product as a critical component in life support or other similar systems is not authorized. SiPower does not assume any liability arising out of the application or use of any product or circuit described. Herein; neither does it convey any license under its patent rights, nor the rights of others. SiPower reserves the right to make changes without further notice to any products herein to improve reliability, function or design.

Package Outline Dimensions



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.20	4.50	4.80
b	0.60	0.80	1.00
b1	1.10	1.38	1.80
c	0.30	0.48	0.65
c1	1.10	1.30	1.50
E	9.70	10.00	10.40
E1	7.40	8.30	9.20
e	2.54 (ref.)		
L	12.70	13.60	14.50
L1	2.50	2.75	3.00
L2	1.00	1.40	1.80
L3	2.60	3.35	4.10
L4	14.30	15.15	16.00
L5	6.00	6.40	6.80
φ	3.40	3.70	4.00
D	8.30	8.85	9.40
F	—	—	—
G	1.89	2.49	3.09

1. All Dimensions Are in Millimeters.
2. Dimension Does Not Include Mold Protrusions.

SiPower Inc. - Legal Notice

Disclaimer – All data and specifications are subject to changes without notice

SiPower Inc, it's affiliates, agents, distributors and employees neither accept nor assume any responsibility for errors or inaccuracies. All data and specifications are intended for information and provide a product description only. Electrical and mechanical parameters listed in SiPower data sheets and specifications will vary dependent upon application and environmental conditions . SiPower is not liable for any damages occurred or resulting from any circuit, product or end-use application for which it's products are used. SiPower products are not intended or designed for use in life saving or sustaining apparatus and purchase of any SiPower products automatically indemnifies SiPower against any claims or damages resulting from application malfunction.