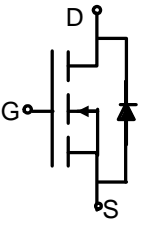


FH4008B

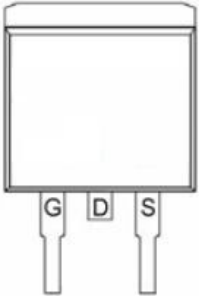
N-Channel Trench Power MOSFET

<h3>General Features</h3> <ul style="list-style-type: none"> ● Proprietary New Trench Technology ● $R_{DS(ON),typ.}=2.8m\Omega@V_{GS}=10V$ ● Low Gate Charge Minimize Switching Loss ● Fast Recovery Body Diode <h3>Applications</h3> <ul style="list-style-type: none"> ● High efficiency DC/DC Converters ● Synchronous Rectification ● UPS Inverter 	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>BV_{DSS}</td> <td>$R_{DS(ON),max.}$</td> <td>$I_D^{[2]}$</td> </tr> <tr> <td>85V</td> <td>3.5mΩ</td> <td>207A</td> </tr> </table>	BV_{DSS}	$R_{DS(ON),max.}$	$I_D^{[2]}$	85V	3.5m Ω	207A
BV_{DSS}	$R_{DS(ON),max.}$	$I_D^{[2]}$					
85V	3.5m Ω	207A					




Schematic diagram

TO-263



Marking and pin assignment



TO-263 top view

Absolute Maximum Ratings

$T_c=25^\circ C$ unless otherwise specified

Symbol	Parameter	Value	Unit
V_{DSS}	Drain to Source Voltage ^[1]	85	V
V_{GSS}	Gate-to-Source Voltage	± 20	
I_D	Continuous Drain Current ^[2]	207	A
	Continuous Drain Current ^[3]	192	
	Continuous Drain Current at $T_c=100^\circ C$ ^[2]	147	
I_{DM}	Pulsed Drain Current at $V_{GS}=10V$ ^[2,4]	830	
E_{AS}	Single Pulse Avalanche Energy ($V_{DD}=30V, V_{GS}=10V, R_G=25\Omega, L=1mH$)	421	mJ
P_D	Power Dissipation	341	W
	Derating Factor above $25^\circ C$	2.3	W/ $^\circ C$
T_L	Soldering Temperature	300	$^\circ C$
	Distance of 1.6mm from case for 10 seconds		
$T_J \& T_{STG}$	Operating and Storage Temperature Range	-55 to 175	

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case			0.44	/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient			61	

Electrical Characteristics

OFF Characteristics

 $T_J = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	85			V	$V_{GS}=0V, I_D=250\mu A$
I_{DSS}	Drain-to-Source Leakage Current			1	μA	$V_{DS}=68V, V_{GS}=0V$
I_{GSS}	Gate-to-Source Leakage Current			± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$

ON Characteristics

 $T_J = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	2.8	3.5	m Ω	$V_{GS}=10V, I_D=80A^{[5]}$
$V_{GS(TH)}$	Gate Threshold Voltage	2.0	--	4.0	V	$V_{DS} = V_{GS}, I_D=250\mu A$

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance		9.4		nF	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$
C_{rss}	Reverse Transfer Capacitance		0.21			
C_{oss}	Output Capacitance		0.86			
R_g	Gate Series Resistance		1.5		Ω	$f=1.0MHz$
Q_g	Total Gate Charge		154		nC	$V_{DD}=40V, I_D=120A, V_{GS}=10V$
Q_{gs}	Gate-to-Source Charge		54			
Q_{gd}	Gate-to-Drain (Miller) Charge		41			

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time		35		ns	$V_{DD}=40V, I_D=120A, V_{GS}=10V, R_G=2.5\Omega$
t_{rise}	Rise Time		16			
$t_{d(off)}$	Turn-off Delay Time		90			
t_{fall}	Fall Time		27			

Source-Drain Body Diode Characteristics

 $T_J = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
I_{SD}	Continuous Source Current ^[2]			207	A	Maximum Ratings
V_{SD}	Diode Forward Voltage		0.9	1.2	V	$I_S=80A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time		67		ns	$V_{GS}=0V$
Q_{rr}	Reverse Recovery Charge		180		nC	$I_F=20A, di/dt=100A/\mu s$

Note:

 [1] $T_J = +25^\circ\text{C}$ to $+175^\circ\text{C}$

[2] Silicon limited current only

[3] Package limited current

[4] Repetitive rating, pulse width limited by both maximum junction temperature.

 [5] Pulse width $\leq 380\mu s$; duty cycle $\leq 2\%$.

Typical Characteristics

Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case

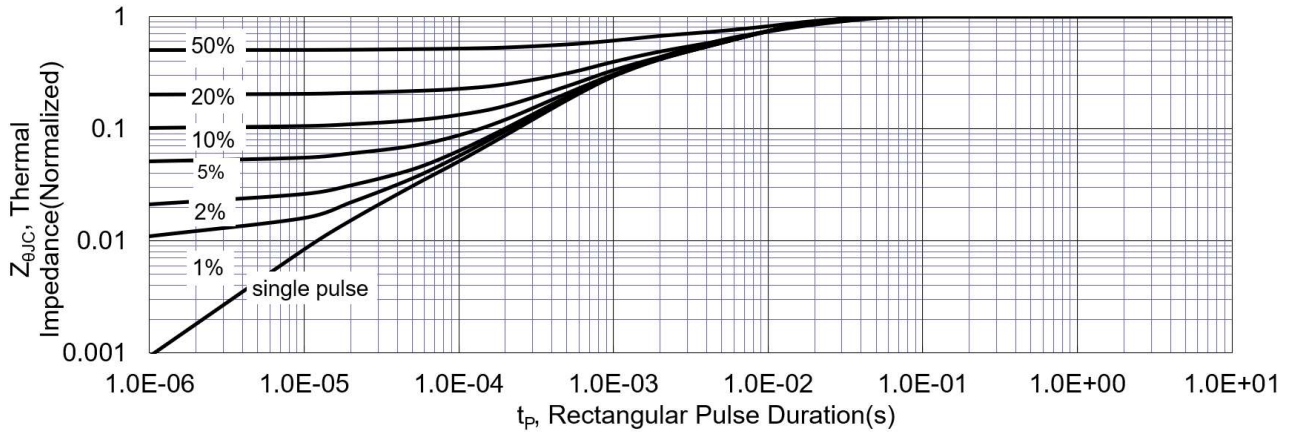


Figure 2. Maximum Power Dissipation vs. Case Temperature

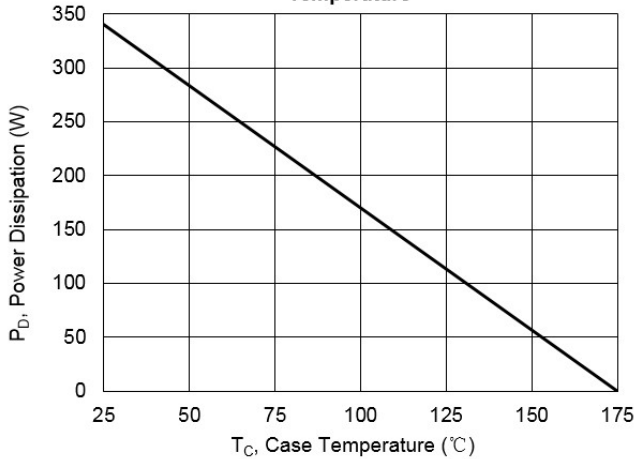


Figure 3. Maximum Continuous Drain Current vs Case Temperature

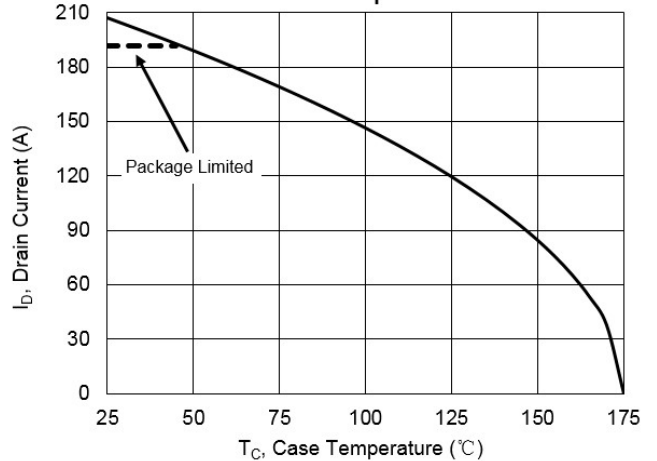


Figure 4. Typical Output Characteristics

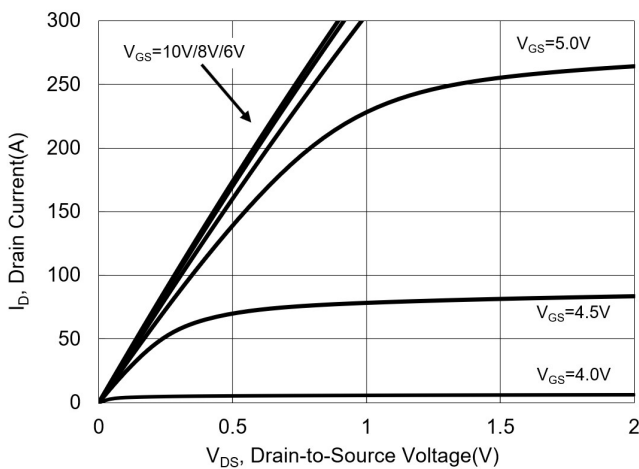


Figure 5. Typical Drain-to-Source ON Resistance vs. Gate Voltage

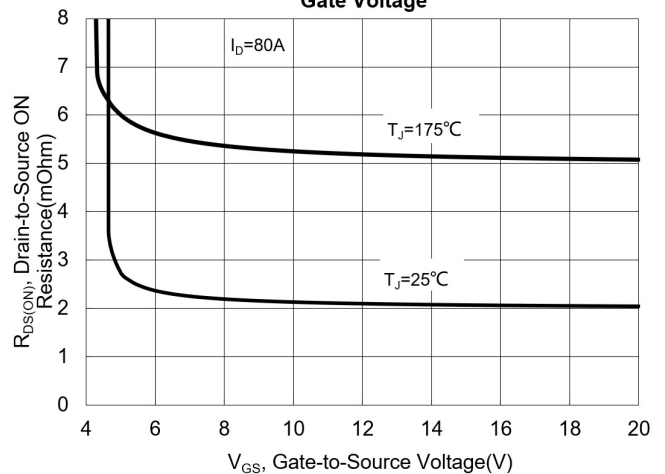


Figure 6. Maximum Peak Current Capability

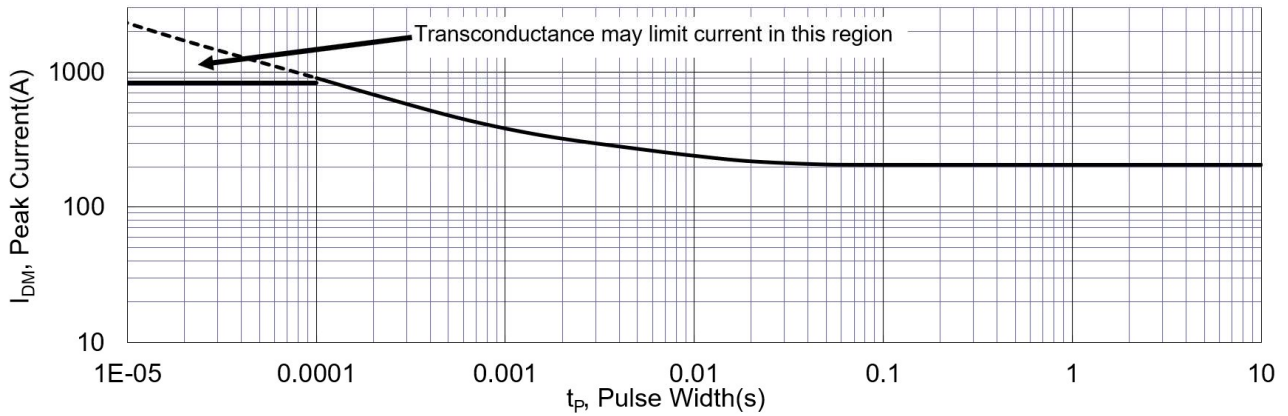


Figure 7. Typical Transfer Characteristics

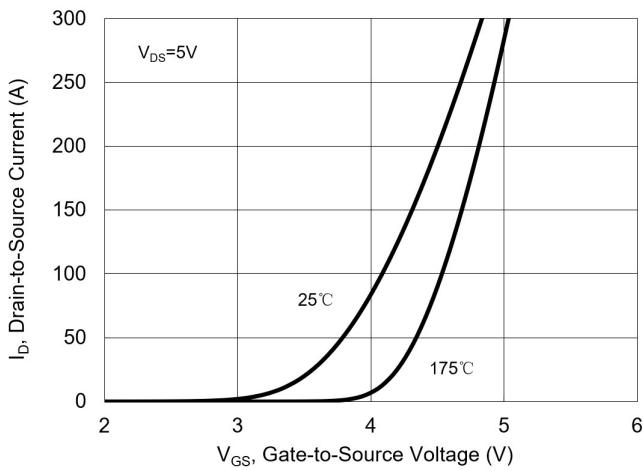


Figure 8. Unclamped Inductive Switching Capability

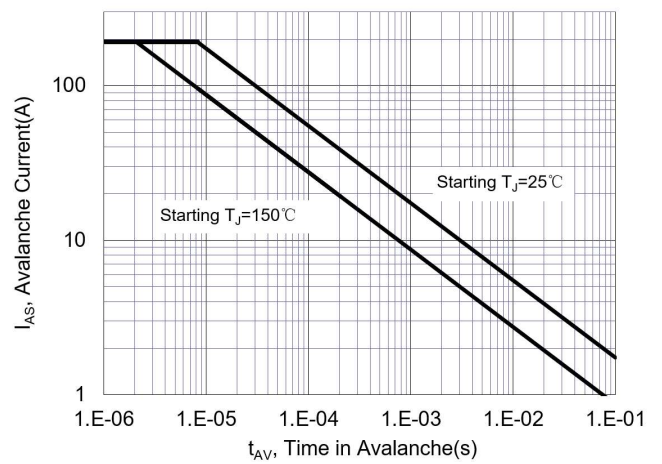


Figure 9. Typical Drain-to-Source ON Resistance

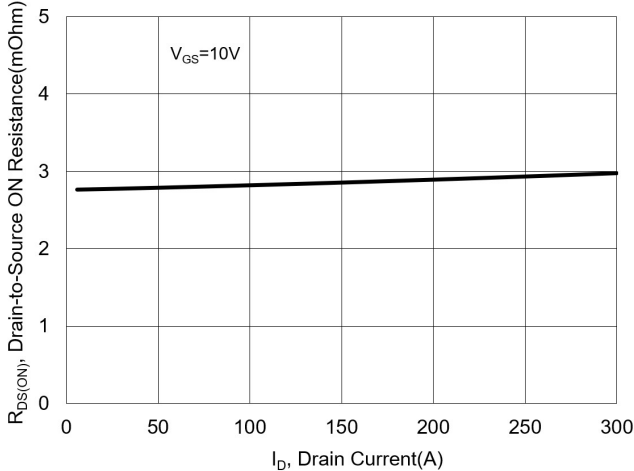


Figure 10. Typical Drain-to-Source On Resistance vs. Junction Temperature

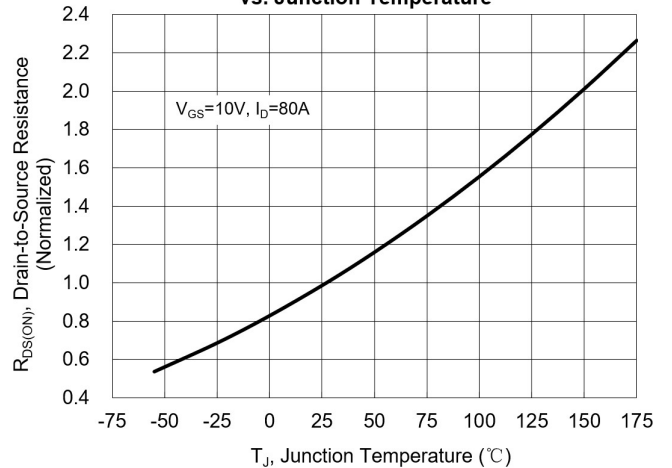


Figure 11. Typical Breakdown Voltage vs. Junction Temperature

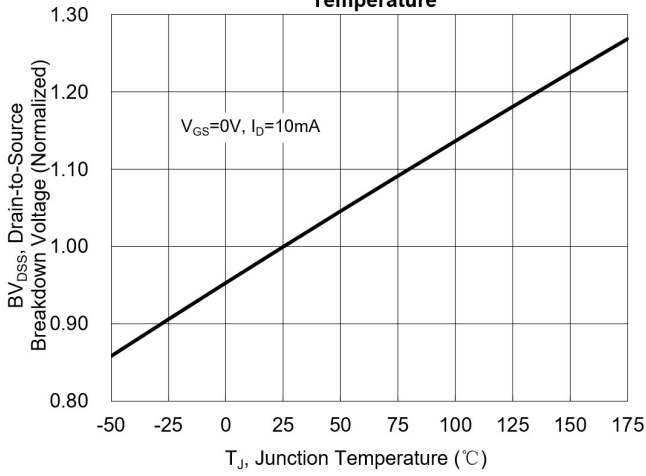


Figure 12. Typical Threshold Voltage vs. Junction Temperature

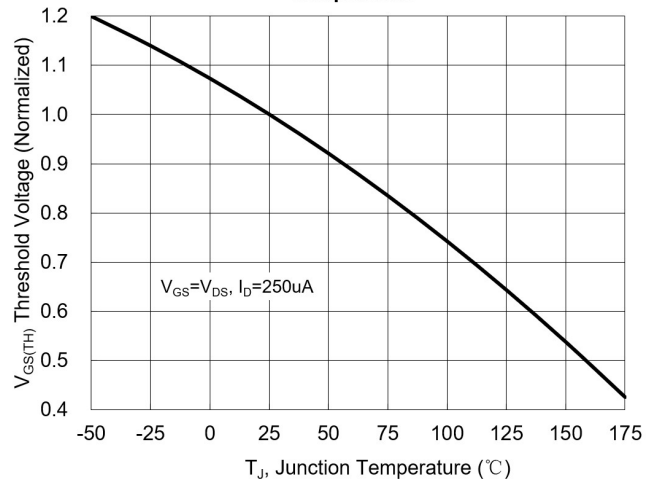


Figure 13. Maximum Forward Safe Operation Area

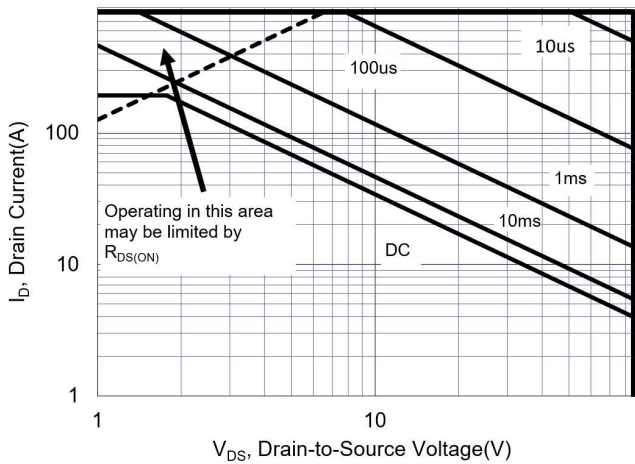


Figure 14. Typical Capacitance vs. Drain-to-Source Voltage

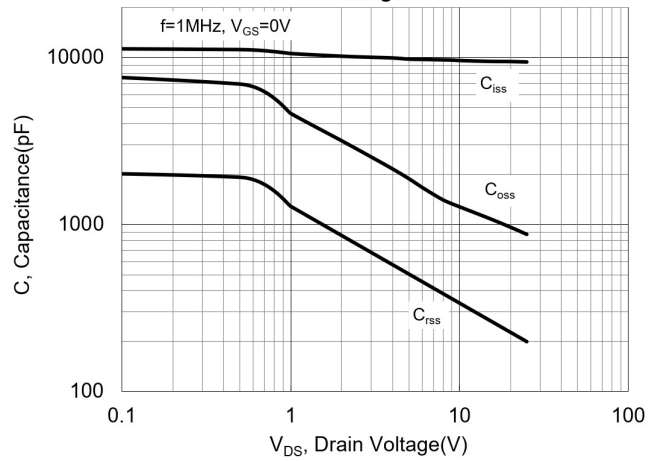


Figure 15. Typical Gate Charge vs. Gate-to-Source Voltage

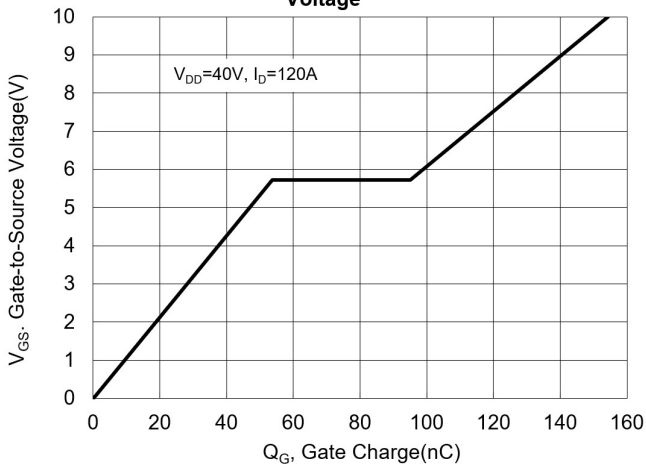
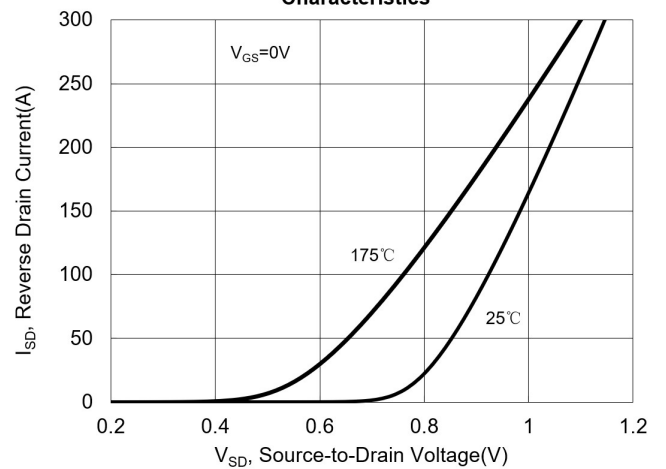
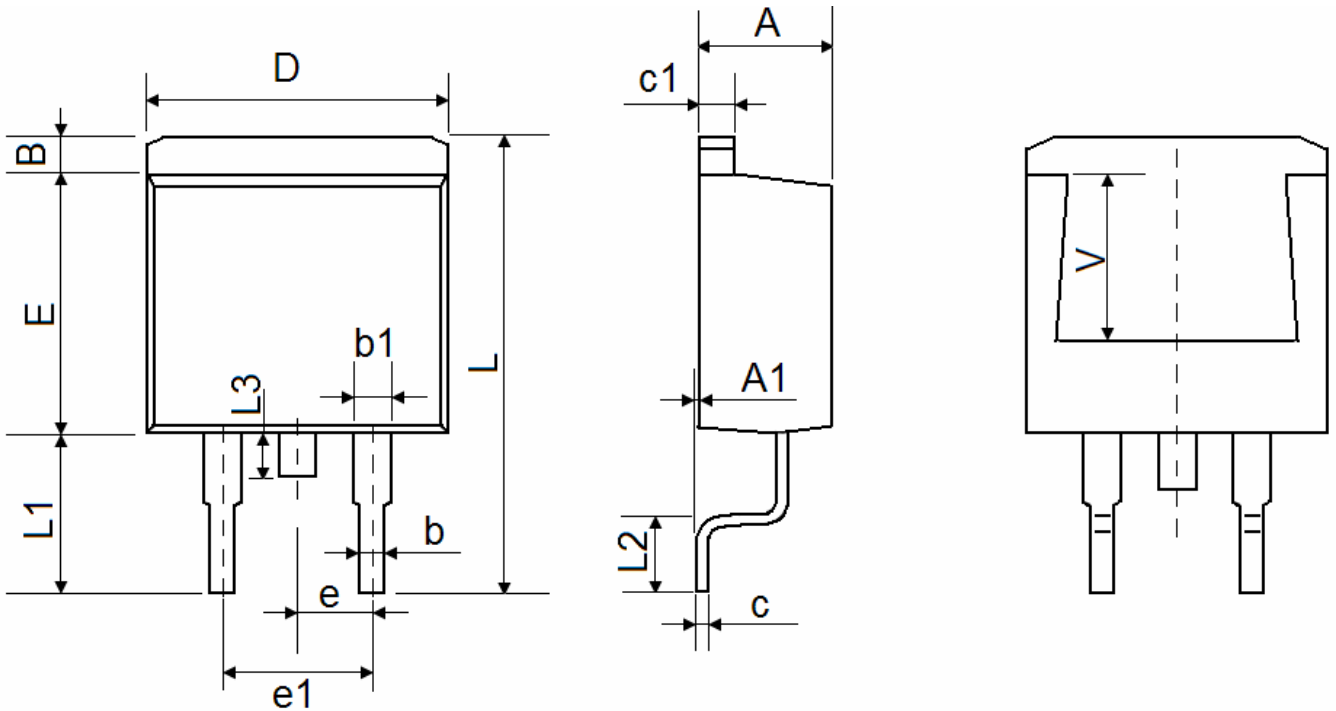


Figure 16. Typical Body Diode Transfer Characteristics



Package Information : TO-263



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.170	1.370	0.046	0.054
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	15.050	15.450	0.593	0.608
L1	5.080	5.480	0.200	0.216
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
V	5.600 REF		0.220 REF	