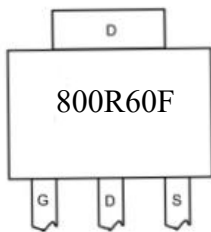
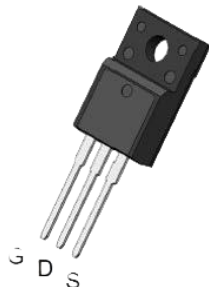
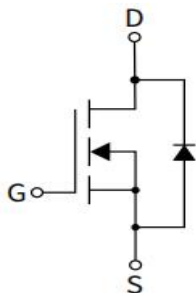




Features ➤High blocking voltage with low on-resistance ➤High speed switching ➤Low switching losses ➤Fast intrinsic diode with low reverse recovery	<i>Bvdss</i>	<i>Rdson</i>	<i>ID</i>
	800V	560mΩ	6A
	Application ➤Uninterruptable power supplies ➤Switch mode power supplies ➤High voltage DC/DC converters		
Package			
			
Marking and pin assignment	TO220F top view	Schematic diagram	

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
800R60F	HLC800R60RF	TO220F	50

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain Source Voltage	V _{DS}	800	V
Gate Source Voltage	V _{GS,max}	-8 ~ 22	V
Gate Source Voltage	V _{GS,op}	-4 ~ 18	V
Continuous Drain Current	I _D	6	A
Pulsed Drain Current	I _{D (pulse)}	15	A
Power Dissipation	P _D	21	W
Operating Junction Temperature	T _{Jmax}	-55 ~ 150	°C
Storage Temperature	T _{stg}	-55 ~ 150	°C

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Case	R _{thJC}	6	°C/W



Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HLC800R60RF	TO220F	1	2	3	Tube

Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=100\mu A$	800	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=750V, V_{GS}=0V$	-	1	50	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=22V$	-	-	100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=1mA$	-	3.2	-	V
		$V_{DS}=V_{GS}, I_D=1mA, T_J=150^{\circ}\text{C}$	-	2.2	-	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=18V, I_D=3A$	-	560	660	m Ω
		$V_{GS}=18V, I_D=3A, T_J=150^{\circ}\text{C}$	-	610	-	
Transconductance	gfs	$V_{DS}=18V, I_{DS}=3A$	-	1.2	-	S
		$V_{DS}=18V, I_{DS}=3A, T_J=150^{\circ}\text{C}$	-	1	-	
Internal Gate Resistance	R_g	$V_{AC}=25mV, f=1MHz$	-	8	-	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=400V,$ $f=1MHz, V_{AC}=25mV$	-	117	-	pF
Output Capacitance	C_{oss}		-	13	-	
Reverse Transfer Capacitance	C_{rss}		-	1.3	-	
Coss Stored Energy	E_{oss}			1.2		μJ
Total Gate Charge	Q_g	$V_{DD}=400V, I_D=3A,$ $V_{GS}=-4/18V$	-	6.5	-	nC
Gate to Source Charge	Q_{gs}		-	1.2	-	
Gate to Drain Charge	Q_{gd}		-	4.9	-	
Turn-On Switching Energy	E_{ON}	$V_{DD}=400V, I_D=3A,$ $R_G=2.5\Omega, V_{GS}=-4/18V,$ $L=200\mu H$	-	8	-	μJ
Turn-Off Switching Energy	E_{OFF}		-	7	-	
Turn-On Delay Time	$t_{d(on)}$		-	7	-	ns
Rise Time	t_r		-	10	-	
Turn-Off Delay Time	$t_{d(off)}$		-	10	-	
Fall Time	t_f		-	12	-	

Reverse Diode Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{SD}	$V_{GS}=-4V, I_{SD}=2A, T_J=25^{\circ}\text{C}$	-	4.4	-	V
		$V_{GS}=-4V, I_{SD}=2A, T_J=150^{\circ}\text{C}$	-	4.1	-	V
Reverse Recover time	t_{rr}	$V_{GS}=-4V, I_{SD}=3A,$ $V_R=400V, di/dt=1050A/\mu s$	-	25	-	ns
Reverse Recovery Charge	Q_{rr}		-	20	-	nC
Peak Reverse Recovery Current	I_{rrm}		-	1.5	-	A



Typical Performance Characteristics

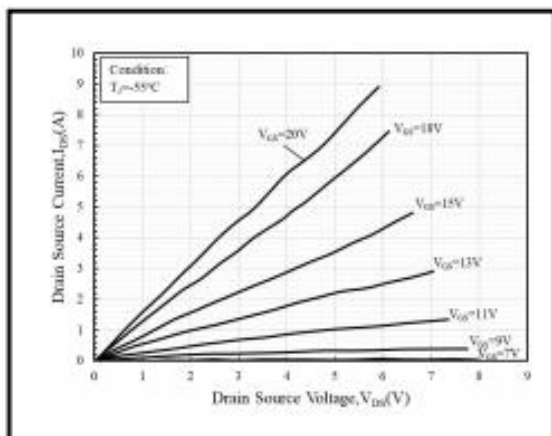
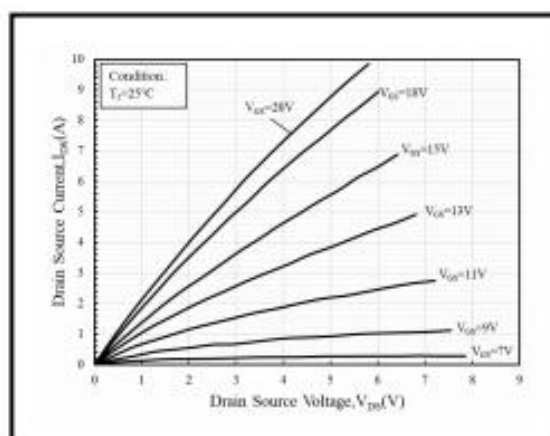
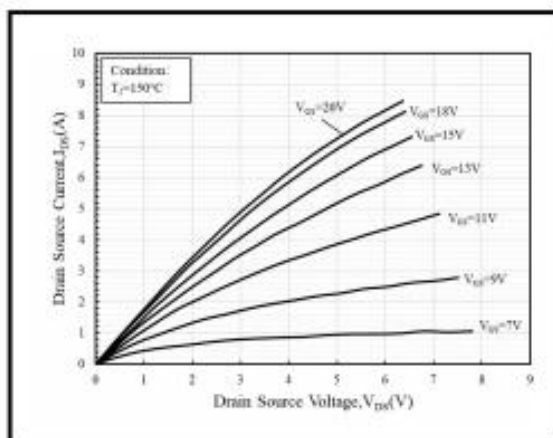
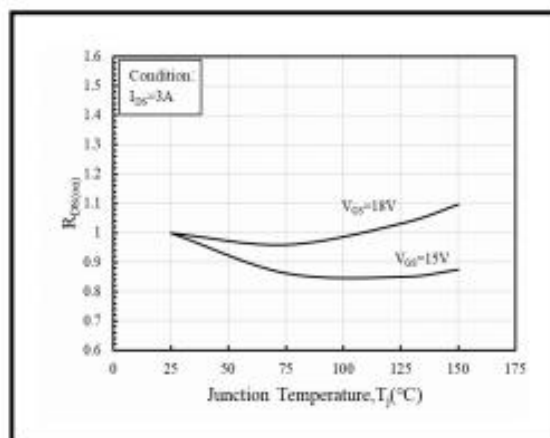
Fig.1 Typical Output Characteristics at $T_j = -55^\circ\text{C}$ Fig.2 Typical Output Characteristics at $T_j = 25^\circ\text{C}$ Fig.3 Typical Output Characteristics at $T_j = 150^\circ\text{C}$ 

Fig.4 Normalized On-Resistance vs Temperature

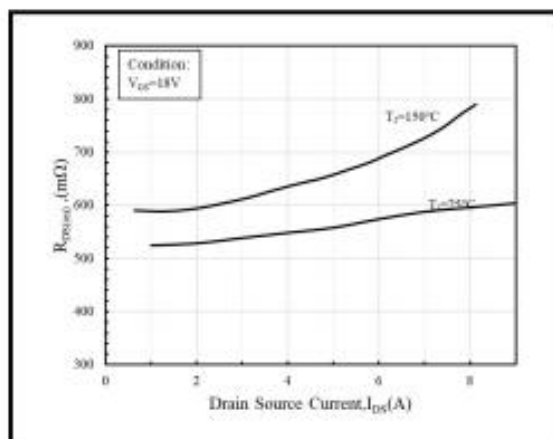


Fig.5 On-Resistance vs Drain Current For Various Temperatures

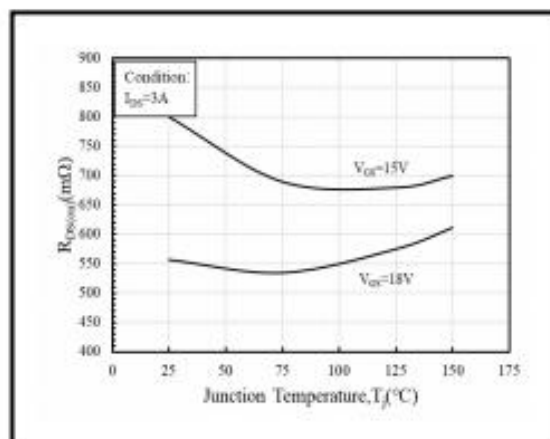


Fig.6 On-Resistance vs Temperature For Various Gate Voltage

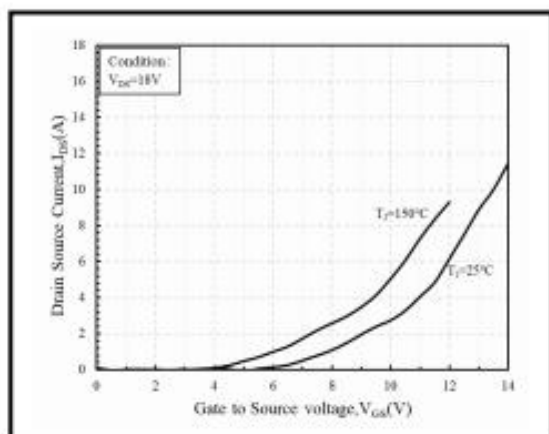


Fig. 7 Transfer Characteristics for Various Temperatures

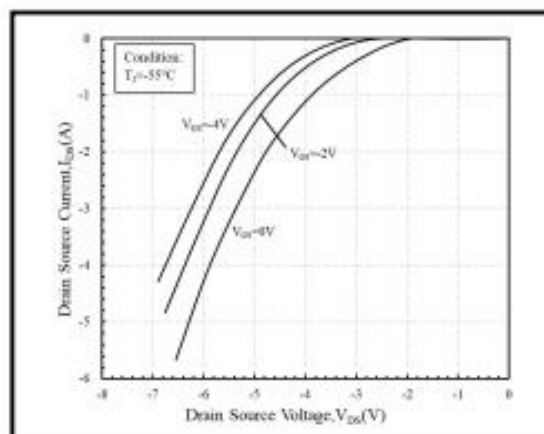


Fig. 8 Body Diode Characteristics at -55 °C

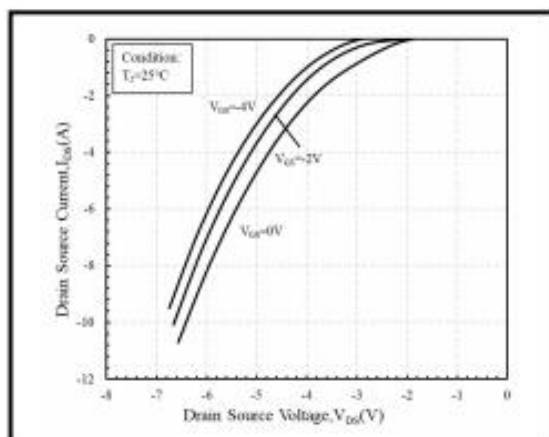


Fig. 9 Body Diode Characteristics at 25°C

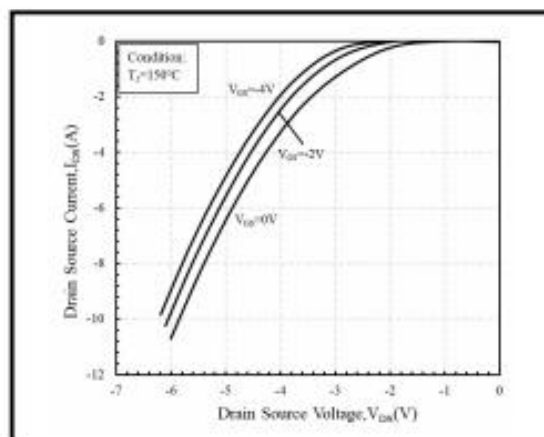
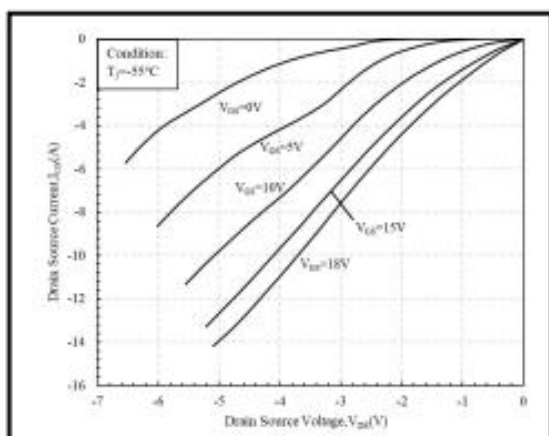
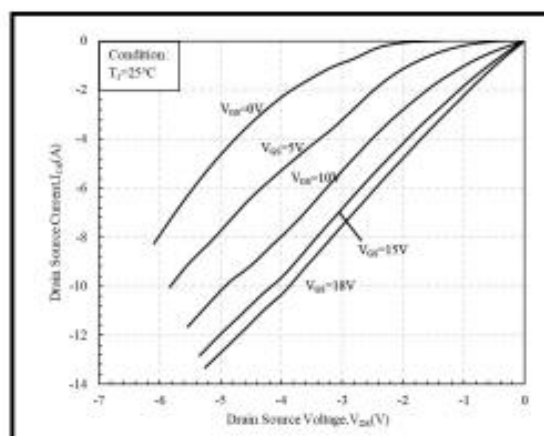


Fig. 10 Body Diode Characteristics at 175 °C

Fig. 11 3rd Quadrant Characteristics at -55°CFig. 12 3rd Quadrant Characteristics at $T_J = 25^\circ C$

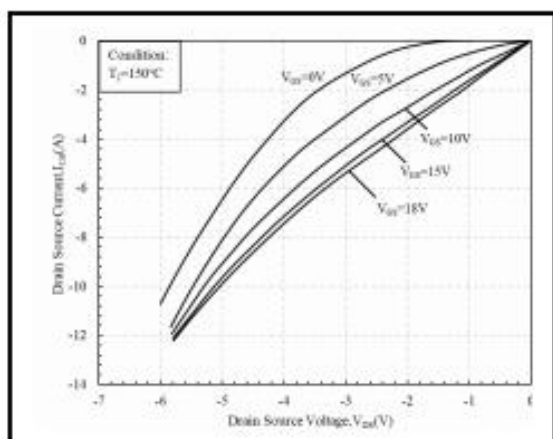
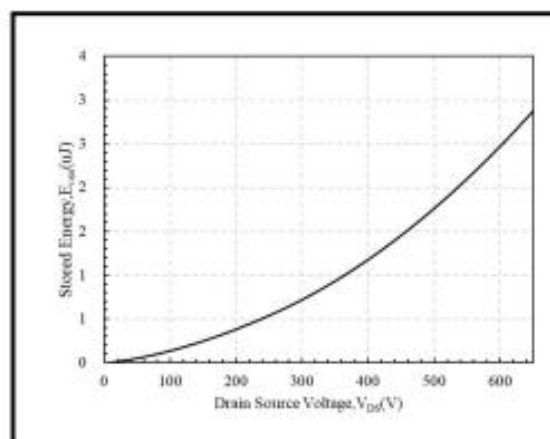
Fig. 13 3rd Quadrant Characteristics at 150°C

Fig. 14 Output Capacitor Stored Energy

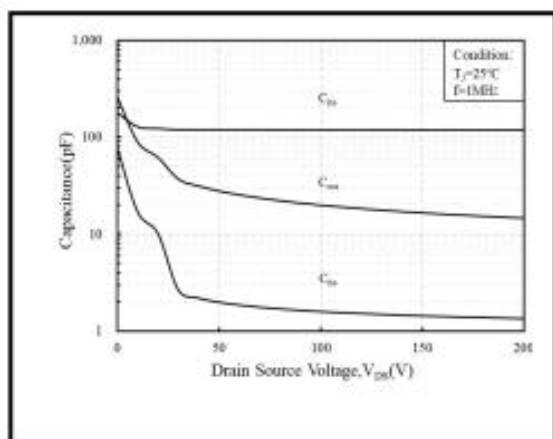


Fig. 15 Capacitances vs Drain-Source Voltage (0-200 V)

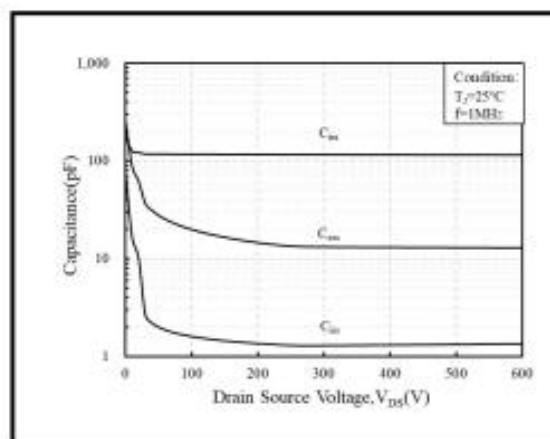


Fig. 16 Capacitances vs Drain-Source Voltage (0-650 V)

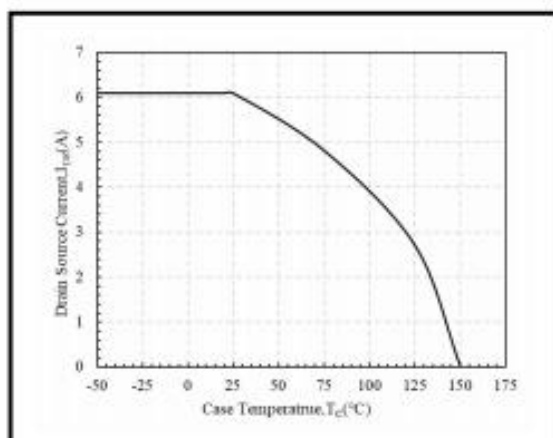


Figure 17. Continuous Drain Current Derating vs Case Temperature

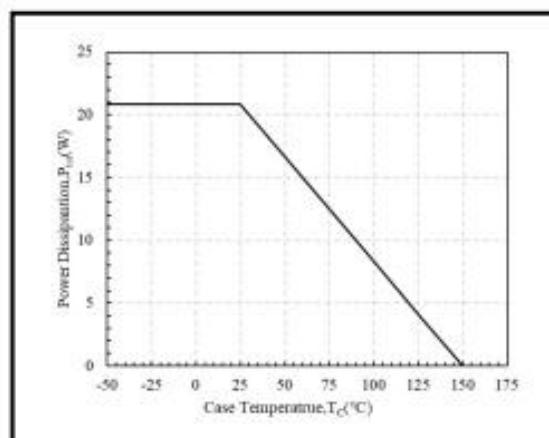


Figure 18. Maximum Power Dissipation Derating vs Case Temperature

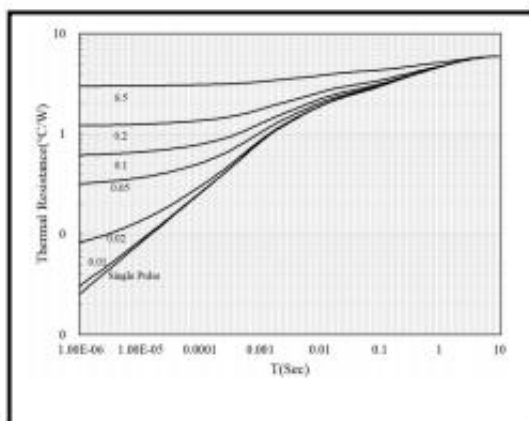


Figure 19. Transient Thermal Impedance (Junction-Case)

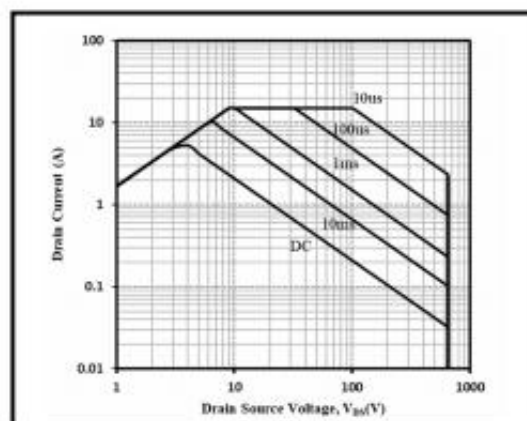


Figure 20. Safe Operating Area

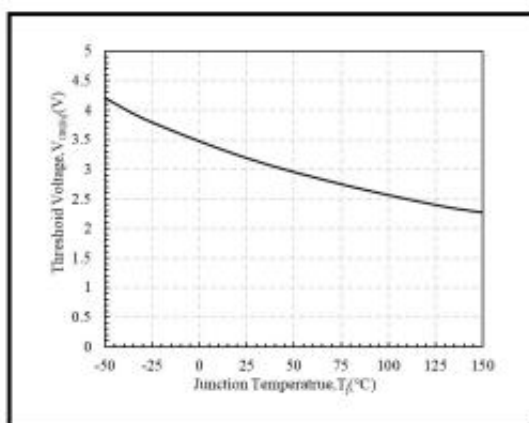


Figure 21. Gate Charge Characteristics

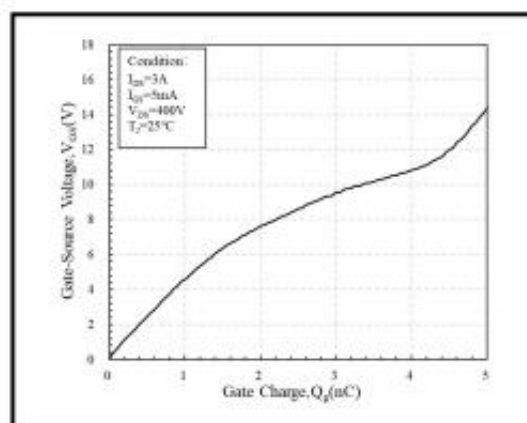
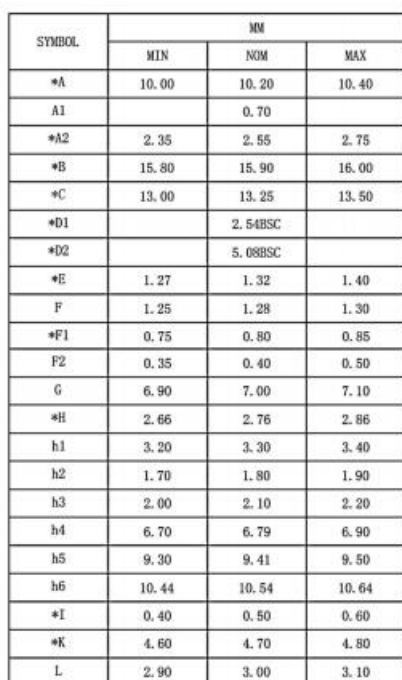


Figure 22. Threshold Voltage vs Temperature



Package Dimensions TO220F



SYMBOL	MM		
	MIN	NOM	MAX
*A	10.00	10.20	10.40
A1		0.70	
*A2	2.35	2.55	2.75
*B	15.80	15.90	16.00
*C	13.00	13.25	13.50
*D1		2.54BSC	
*D2		5.08BSC	
*E	1.27	1.32	1.40
F	1.25	1.28	1.30
*F1	0.75	0.80	0.85
F2	0.35	0.40	0.50
G	6.90	7.00	7.10
*H	2.66	2.76	2.86
h1	3.20	3.30	3.40
h2	1.70	1.80	1.90
h3	2.00	2.10	2.20
h4	6.70	6.79	6.90
h5	9.30	9.41	9.50
h6	10.44	10.54	10.64
*I	0.40	0.50	0.60
*K	4.60	4.70	4.80
L	2.90	3.00	3.10



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