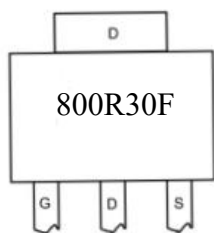


**Features**

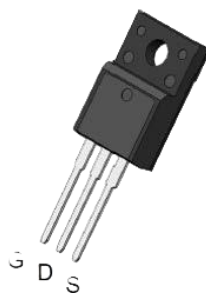
- High blocking voltage with low on-resistance
- High speed switching
- Low switching losses
- Fast intrinsic diode with low reverse recovery

Bvdss**800V*****Rdson*****360mΩ*****ID*****8.7A****Application**

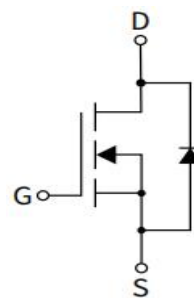
- Uninterruptable power supplies
- Switch mode power supplies
- High voltage DC/DC converters

RoHS**Package**

Marking and pin assignment



TO220F top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
800R30F	HLC800R30RF	TO220F	50

Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ 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	8.7	A
Pulsed Drain Current	$I_{D(pulse)}$	25	A
Power Dissipation	P_D	28	W
Operating Junction Temperature	T_{Jmax}	-55 ~ 150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-55 ~ 150	$^{\circ}\text{C}$

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Case	R_{thJC}	4.5	$^{\circ}\text{C/W}$



Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HLC800R30RF	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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=1mA$	-	2.6	-	V
		$V_{DS}=V_{GS}, I_D=1mA, T_J=150^{\circ}\text{C}$	-	1.8	-	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=18V, I_D=5A$	-	360	390	m Ω
		$V_{GS}=18V, I_D=5A, T_J=150^{\circ}\text{C}$	-	420	-	
Transconductance	gfs	$V_{DS}=18V, I_{DS}=5A$	-	3.8	-	S
		$V_{DS}=18V, I_{DS}=5A, T_J=150^{\circ}\text{C}$	-	3.3	-	
Internal Gate Resistance	R_g	$V_{AC}=25mV, f=1MHz$	-	6	-	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=400V,$ $f=1MHz, V_{AC}=25mV$	-	188	-	pF
Output Capacitance	C_{oss}		-	23	-	
Reverse Transfer Capacitance	C_{rss}		-	2.35	-	
Coss Stored Energy	E_{oss}		-	2	-	
Total Gate Charge	Q_g	$V_{DD}=400V, I_D=5A,$ $V_{GS}=-4/18V$	-	12	-	nC
Gate to Source Charge	Q_{gs}		-	2.4	-	
Gate to Drain Charge	Q_{gd}		-	6	-	
Turn-On Switching Energy	E_{ON}	$V_{DD}=400V, I_D=5A,$ $R_G=2.5\Omega, V_{GS}=-4/18V,$ $L=200\mu H$	-	43	-	μJ
Turn-Off Switching Energy	E_{OFF}		-	520	-	
Turn-On Delay Time	$t_{d(on)}$		-	5	-	ns
Rise Time	t_r		-	8	-	
Turn-Off Delay Time	$t_{d(off)}$		-	8	-	
Fall Time	t_f		-	9	-	

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}	$V_{GS}=-4V, I_{SD}=4A, T_J=25^{\circ}\text{C}$	-	4.4	-	V
		$V_{GS}=-4V, I_{SD}=4A, T_J=150^{\circ}\text{C}$	-	4.1	-	V
Reverse Recover time	t_{rr}	$V_{GS}=-4V, I_{SD}=5A,$ $V_R=400V, di/dt=3000A/\mu s$	-	30	-	ns
Reverse Recovery Charge	Q_{rr}		-	35	-	nC
Peak Reverse Recovery Current	I_{rrm}		-	2.3	-	A



Typical Performance Characteristics

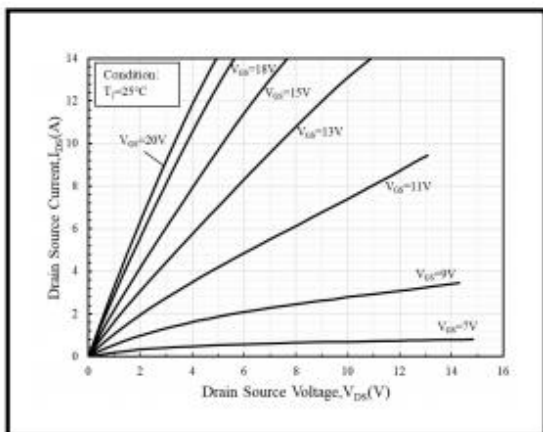
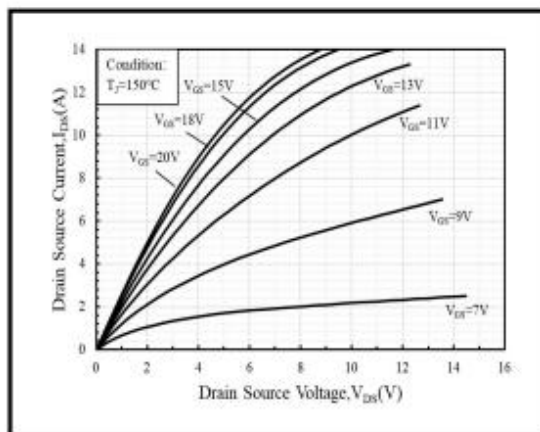
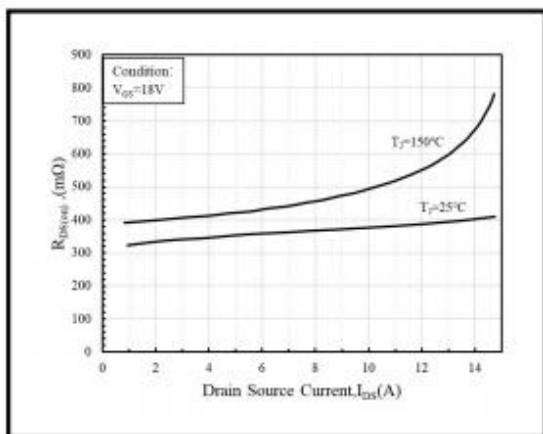
Fig.1 Typical Output Characteristics at $T_j = 25^\circ\text{C}$ Fig.2 Typical Output Characteristics at $T_j = 150^\circ\text{C}$ 

Fig.3 On-Resistance vs Drain Current For Various Temperatures

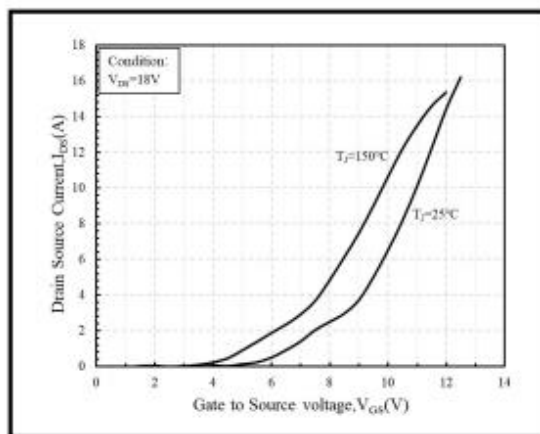
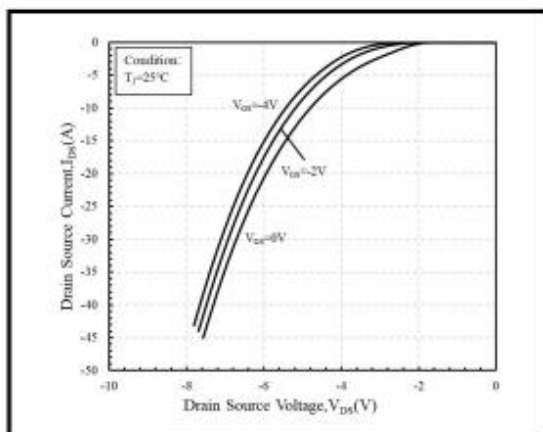
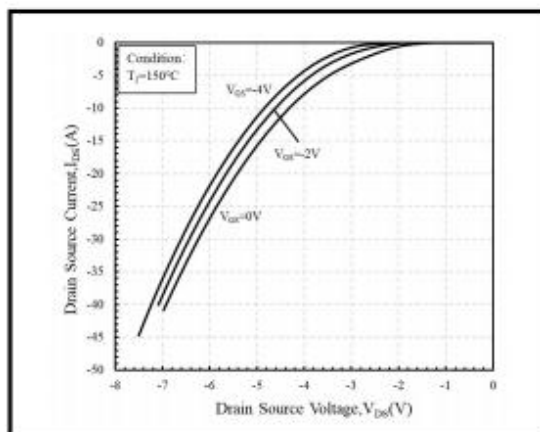


Fig.4 Transfer Characteristics for Various Temperatures

Fig. 5 Body Diode Characteristics at 25°C Fig.6 Body Diode Characteristics at 150°C

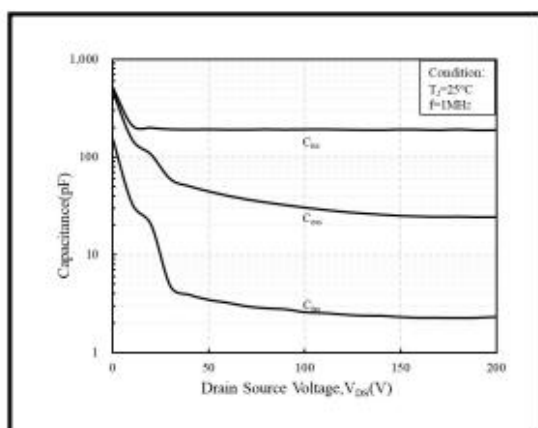


Fig.7 Capacitances vs Drain-Source Voltage(0-200V)

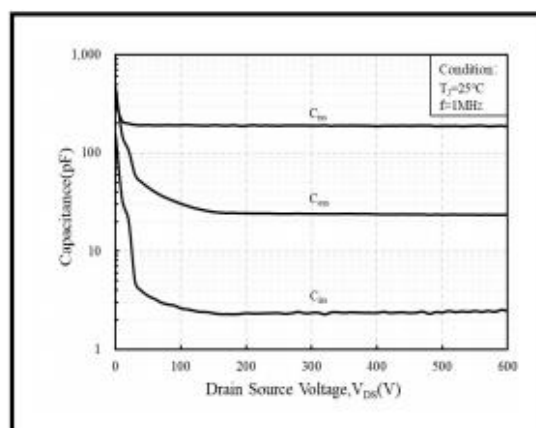


Fig.8 Capacitances vs Drain-Source Voltage(0-600V)

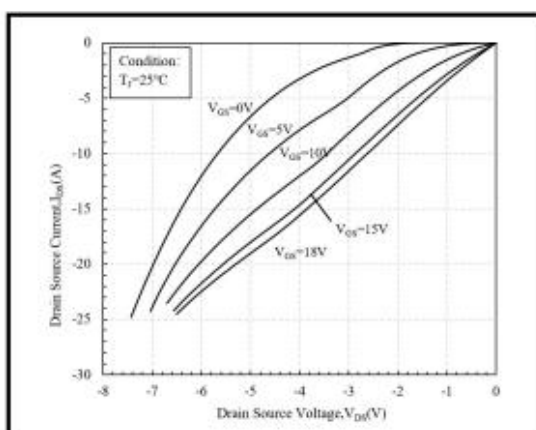
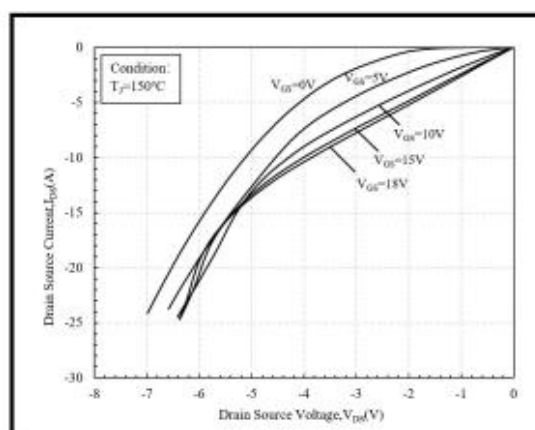
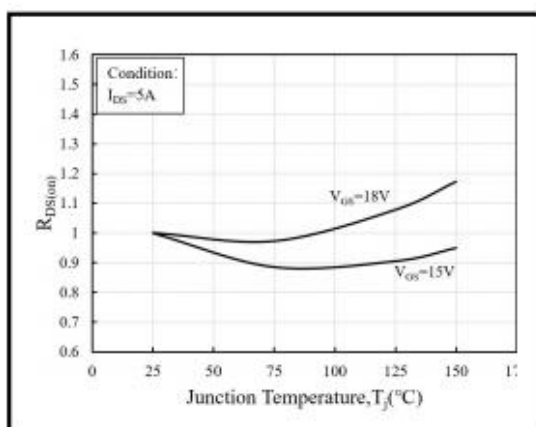
Fig.9 3rd Quadrant Characteristics at $T_J = 25^\circ\text{C}$ Fig.10 3rd Quadrant Characteristics at $T_J = 150^\circ\text{C}$ 

Fig.11 Normalized On-Resistance vs Temperature

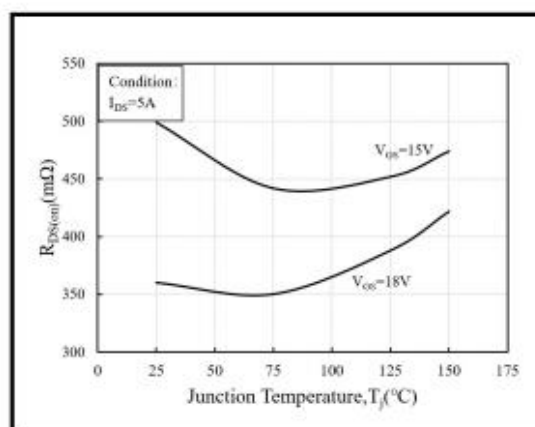


Fig.12 On-Resistance vs Temperature For Various Gate

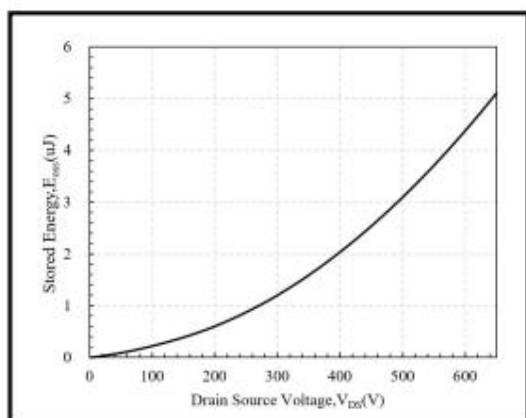


Fig. 13 Output Capacitor Stored Energy

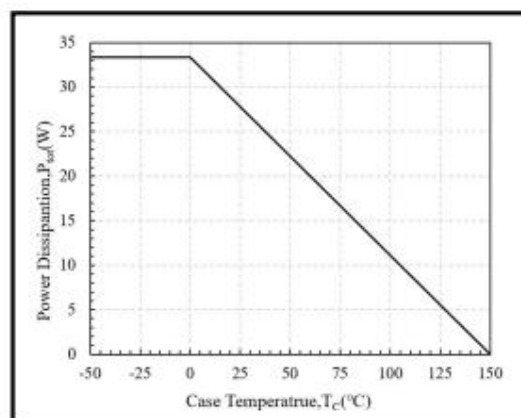


Fig. 14 Maximum Power Dissipation Derating vs Case Temperature

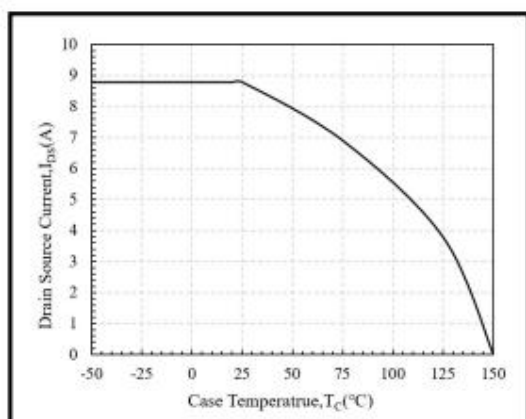


Fig. 15 Continuous Drain Current Derating vs Case Temperature

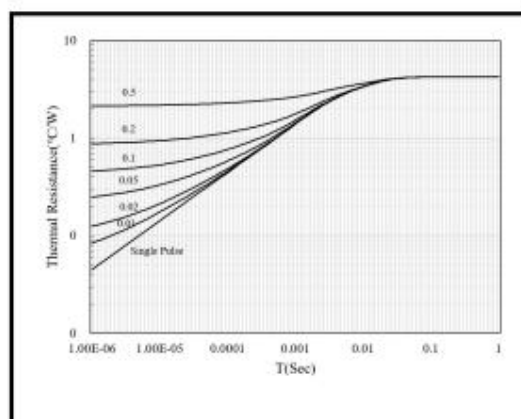


Fig. 16 Transient Thermal Impedance (Junction-Case)

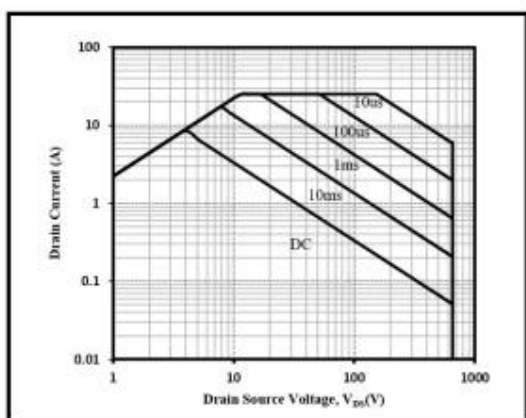


Fig. 17 Safe Operating Area

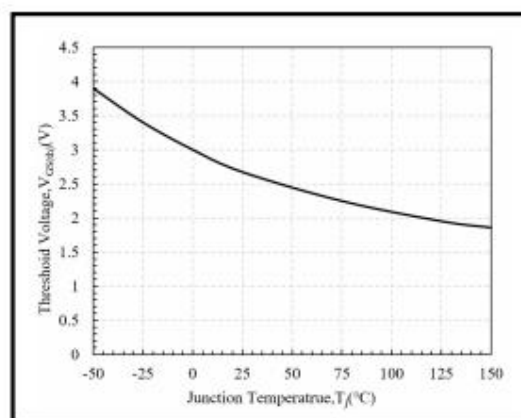


Fig. 18 Threshold Voltage vs Temperature

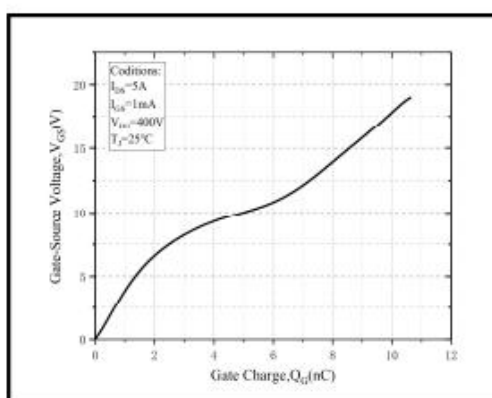
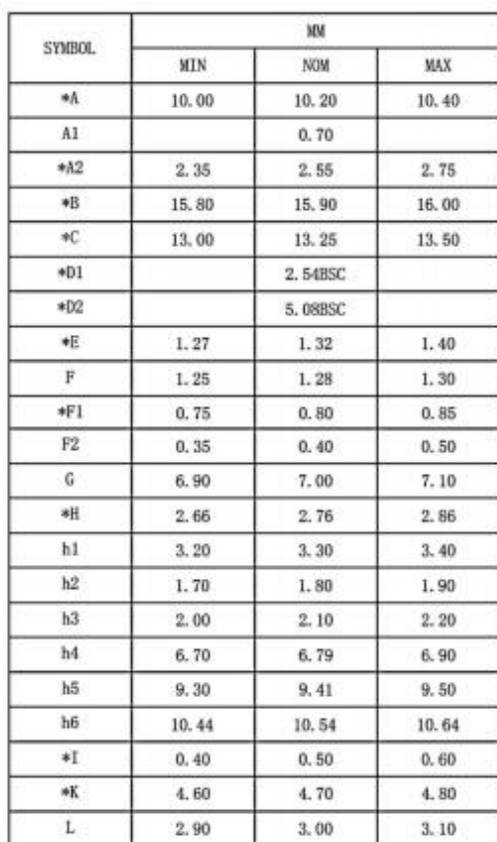


Fig.19 Gate Charge Characteristics



Package Dimensions TO220F





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