SuperMOS – TO-220 68V BV_{DSS}, 6.6mΩ $R_{DS(ON)}$, N-channel MOSFET

1. Description

The IRFB3607PBF-ES is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product IRFB3607PBF-ES is Pb-free.

2. Features

- 68V, $R_{DS(ON)}$=6.6mΩ(Typ.) @V_{GS}=10V
- Use trench MOSFET technology
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

3. Applications

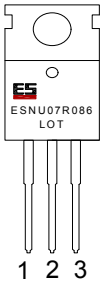
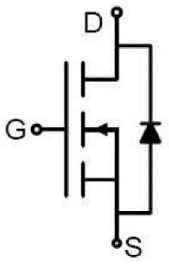
- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per Tube	Flammability Rating
IRFB3607PBF-ES	TO-220	ESNU07R088/lot	Halogen free	Tube	50 PCS	UL 94V-0

5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
1	Gate		
3	Source		
2	Drain		

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 ℃ ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		BV_{DSS}	68	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	80	A
	T_C=75°C		52	
Maximum Power Dissipation		P_D	147	W
Pulsed Drain Current		I_{DM}	320	A
Avalanche Current, Single Pulsed [a]		I_{AS}	22	A
Avalanche Energy, Single Pulsed [a]		E_{AS}	121	mJ
Operating Junction Temperature		T_J	150	°C
Lead Temperature		T_L	260	°C
Storage Temperature Range		T_{stg}	-55 to 150	°C

Thermal resistance ratings

Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Case Thermal Resistance	$R_{\theta JC}$		0.85	°C/W

Note:

a: Tj=25℃,V_{DD}=35V, V_G=10V, L=0.5mH,Rg=25Ω

Electrical Characteristics

At TA = 25℃ unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	68			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=68V, V_{GS}=0V			1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D=250uA	2.0	2.9	4.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=30A		6.6	8.6	mΩ
Forward transconductance	g_{fs}	V_{DS}=5V, I_D=30A			150	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS}=0V, f=1MHz, V_{DS}=25V		4065		pF
Output Capacitance	C_{OSS}			266		
Reverse Transfer Capacitance	C_{RSS}			230		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS}=10V, V_{DS}=30V, I_D=20A		35		nC
Gate-to-Source Charge	Q_{GS}			11		
Gate-to-Drain Charge	Q_{GD}			9		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS}=10V, V_{DS}=30V, I_D=20A, R_G=3Ω		15		ns
Rise Time	t_r			95		
Turn-Off Delay Time	$t_{d(OFF)}$			48		
Fall Time	t_f			33		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS}=0V, I_S=30A			1.5	V

7. Typical Characteristic

Figure1: Output Characteristics

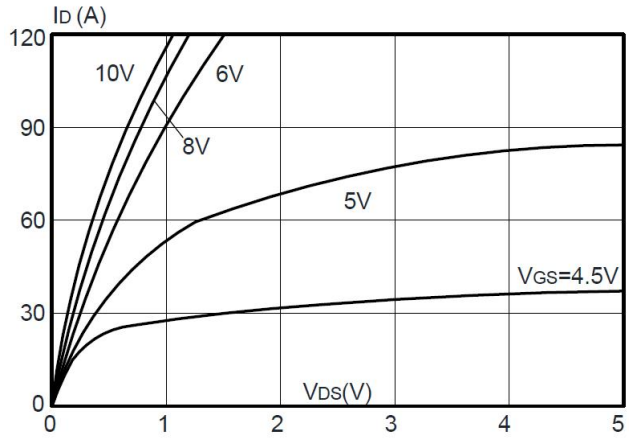


Figure 2: Typical Transfer Characteristics

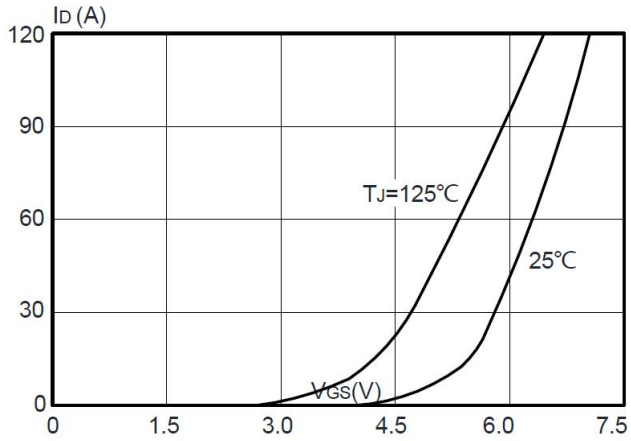


Figure 3: On-resistance vs. Drain Current

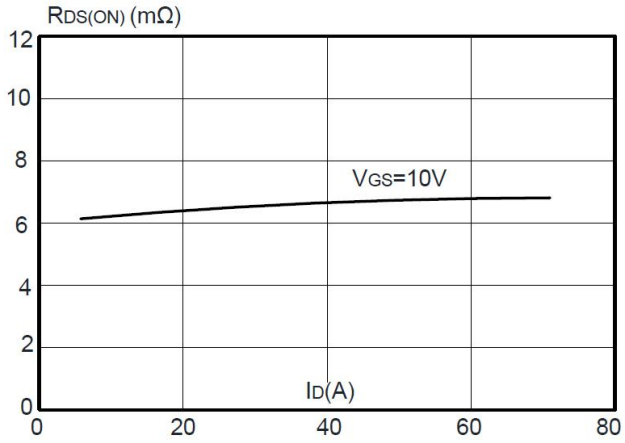


Figure 4: Body Diode Characteristics

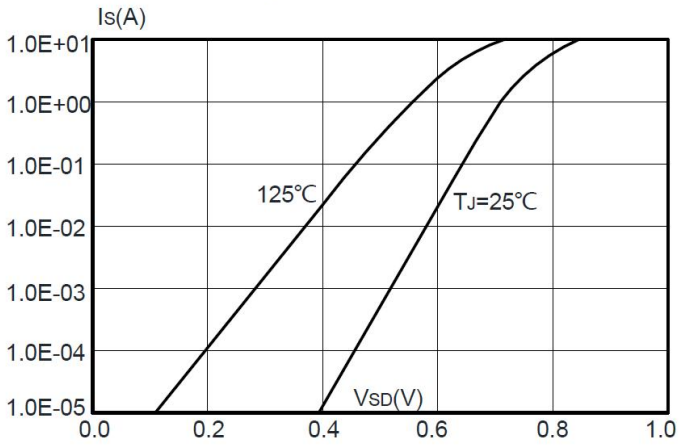


Figure 5: Gate Charge Characteristics

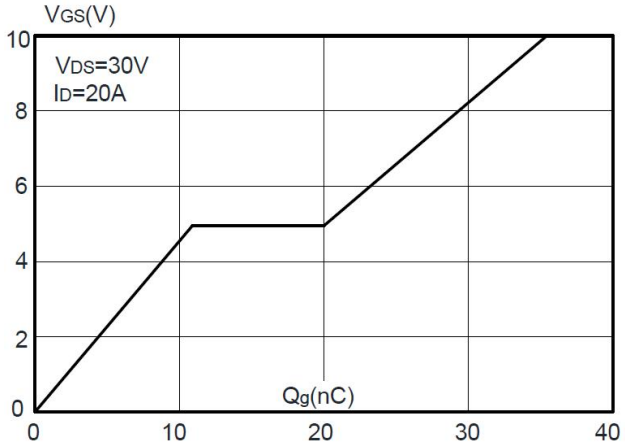


Figure 6: Capacitance Characteristics

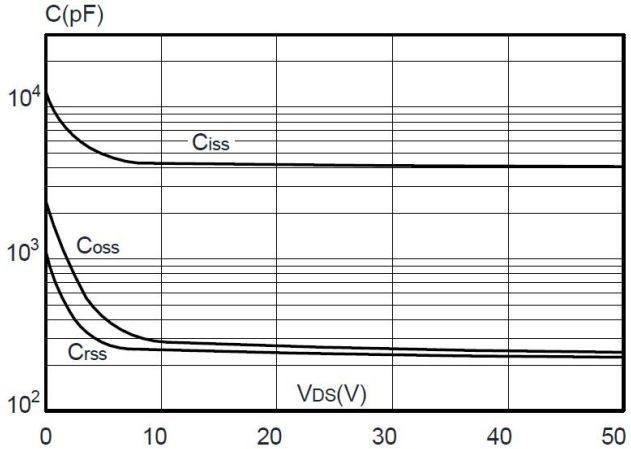


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

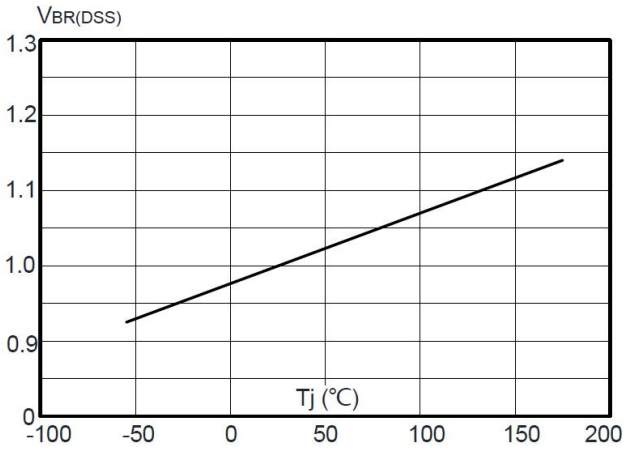


Figure 8: Normalized on Resistance vs. Junction Temperature

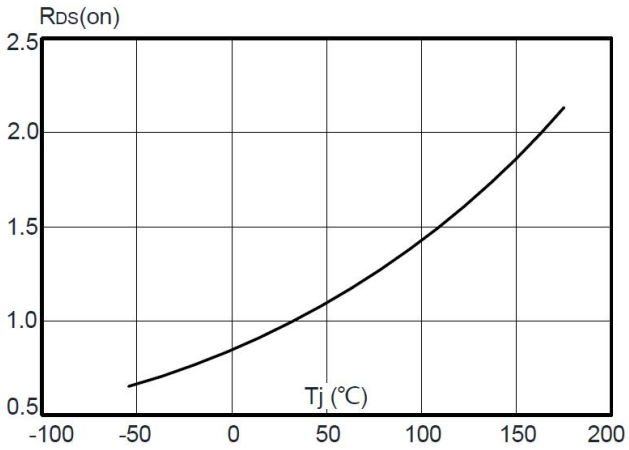


Figure 9: Maximum Safe Operating Area

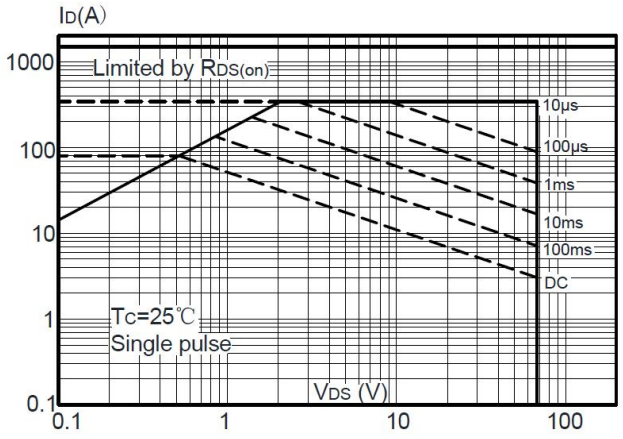


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

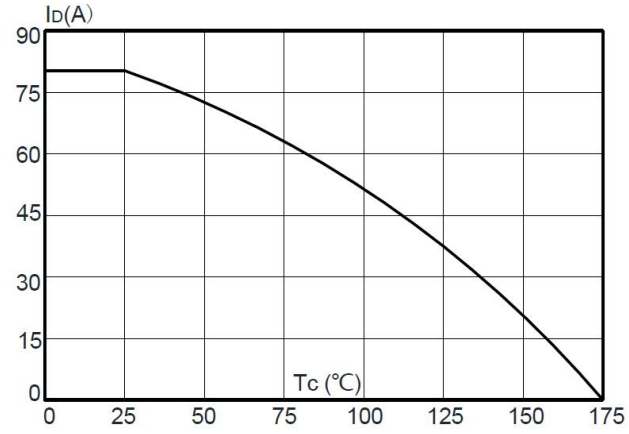
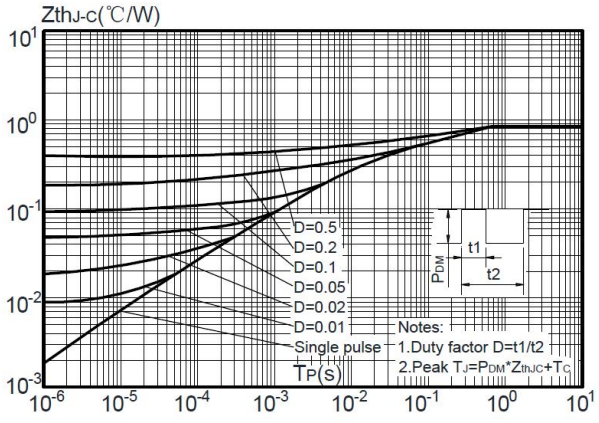
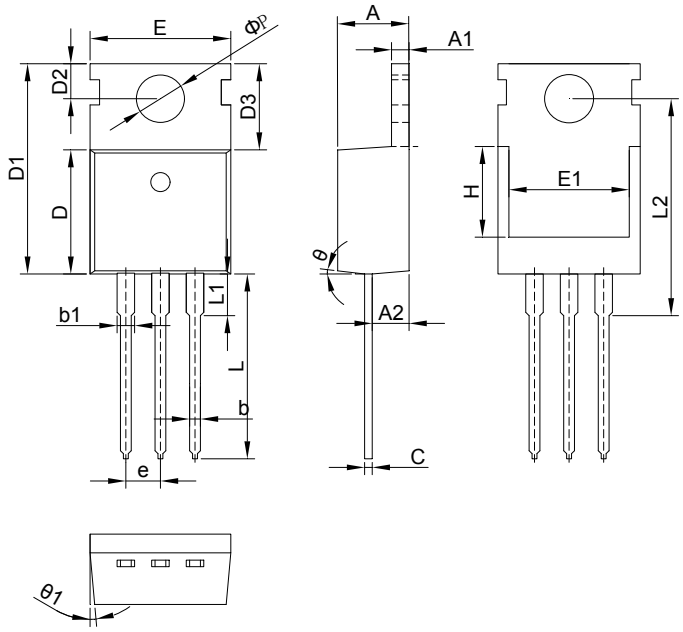


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



8. Dimension (TO-220)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER							
SYMBOL	MIN	TYP	MAX	SYMBOL	MIN	TYP	MAX
A	4.27	4.57	4.87	D3	6.20	6.40	6.60
A1	1.15	1.30	1.45	e	2.54 BSC.		
A2	2.20	2.40	2.60	H	6.70	6.90	7.10
C	0.40	0.50	0.65	E	9.70	9.90	10.10
L1	2.80	3.10	3.40	E1	7.80	8.00	8.20
L	13.20	13.50	13.70	ΦP	3.40	3.60	3.80
L2	15.50	15.90	16.30	b	0.70	0.80	0.90
D	9.00	9.20	9.40	b1	1.17	1.27	1.37
D1	15.10	15.60	16.10	θ	4°	7°	10°
D2	2.60	2.80	3.00	θ1	0°	3°	6°

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