

650V N-Channel Super Junction MOSFET

Voltage	650 V	Rdson	75mΩ
Current	29.2 A	Qg	78.5nC

Feature:

- $R_{DS(ON)}$ Max, $V_{GS}@10V$: 75mΩ
- Body diode with fast recovery characteristics
- High Speed Switching and Low $R_{DS(ON)}$
- 100% Avalanche Tested
- 100% Rg Tested
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

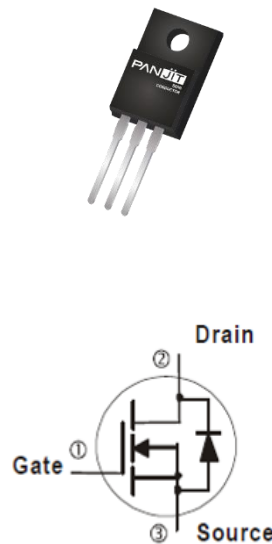
Mechanical Data

- Case: ITO-220AB-F package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 2 grams

Application

- PFC/LLC/ PSFB of Industrial PSU / Battery charger.

ITO-220AB-F



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage @ T_{jmax}		V_{DS}	700	V
Drain-Source Voltage		V_{DS}	650	
Gate-Source Voltage		V_{GS}	± 30	
Continuous Drain Current	$T_C=25^\circ\text{C}$	I_D	29.2	A
	$T_C=100^\circ\text{C}$		18.4	
Pulsed Drain Current	$T_C=25^\circ\text{C}$	I_{DM}	102	A
Single Pulse Avalanche Energy (Note 6)		E_{AS}	180	mJ
MOSFET dv/dt ruggedness		dv/dt	120	V/ns
Diode dv/dt		dv/dt	70	V/ns
Insulation Withstand Voltage for ITO-220AB-F (Note 7)		V_{iso}	3.5	kV
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	156	W
	$T_C=100^\circ\text{C}$		63	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150	$^\circ\text{C}$

Thermal Characteristics

PARAMETER		SYMBOL	VALUES			UNITS
			MIN.	TYP.	MAX.	
Thermal Resistance	Junction-to-Case (Bottom)	$R_{\theta JC}$	-	0.5	0.8	$^\circ\text{C/W}$
	Junction-to-Ambient (Note 4)	$R_{\theta JA}$	-	44.8	60	$^\circ\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3.3	4.0	4.7	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=17A$ (Note 1)	-	62.3	75	m Ω
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Transfer characteristics	gfs	$V_{DS}=20V, I_D=34A$	-	36.6	-	S
Dynamic (Note 5)						
Total Gate Charge	Q_g	$V_{DS}=400V, I_D=34A,$ $V_{GS}=10V$	-	78.5	-	nC
Gate-Source Charge	Q_{gs}		-	22.8	-	
Gate-Drain Charge	Q_{gd}		-	33.6	-	
Input Capacitance	C_{iss}	$V_{DS}=400V, V_{GS}=0V,$ $f=250kHz$	-	3507	-	pF
Output Capacitance	C_{oss}		-	49.7	-	
Reverse Transfer Capacitance	C_{rss}		-	6.1	-	
Effective Output Capacitance Energy Related	$Co(er)$	$V_{DS}=0V$ to 400V, $V_{GS}=0V, f=250kHz$ (Note 4)	-	95	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=400V, I_D=34A,$ $V_{GS}=10V, R_G=10\Omega$ (Note 2)	-	44.4	-	ns
Turn-On Rise Time	t_r		-	140.6	-	
Turn-Off Delay Time	$t_{d(off)}$		-	71.3	-	
Turn-Off Fall Time	t_f		-	59.2	-	
Gate Resistance	R_g	$f=1.0MHz$	-	5.9	-	Ω
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	29.2	A
Diode Forward Voltage	V_{SD}	$I_S=17A, V_{GS}=0V$	-	0.90	1.5	V
Reverse Recovery Charge	Q_{rr}	$I_S=34A$ $di/dt=100A/\mu s$	-	0.97	-	μC
Reverse Recovery Time	T_{rr}		-	144.4	-	ns
Reverse Recovery Current	I_{rrm}		-	12.3	-	A

NOTES :

1. Pulse width $\leq 380\mu s$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature typical characteristics.
3. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance.
4. $Co(er)$ is a capacitance that gives the same stored energy as C_{oss} while V_{DS} is rising from 0V to 400V.
5. Guaranteed by design, not subject to production testing.
6. E_{AS} is calculated based on the condition of $L = 10\text{ mH}$, $I_{AS} = 6\text{ A}$, $V_{DD} = 50\text{ V}$, $V_{GS} = 10\text{ V}$ and 100% test by $L=0.1\text{mH}$.
 $I_{AS} = 7.5A$ in mass production.
7. It's 100% test during mass production by $V_{dc} = 3.5kV$ with 1sec.

TYPICAL CHARACTERISTIC CURVES

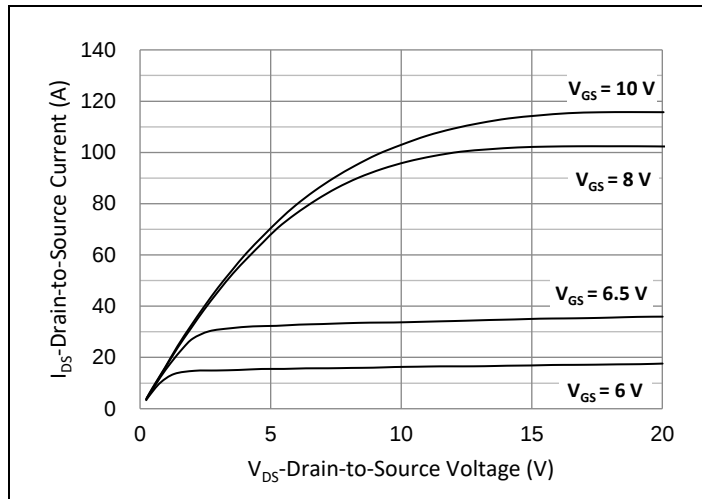


Fig.1 Output Characteristics

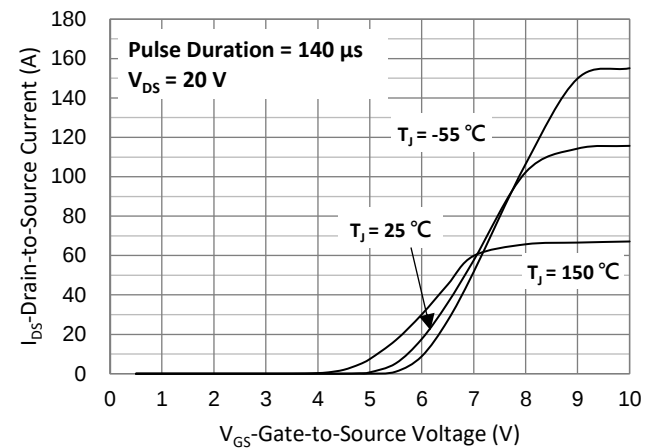


Fig.2 Transfer Characteristics

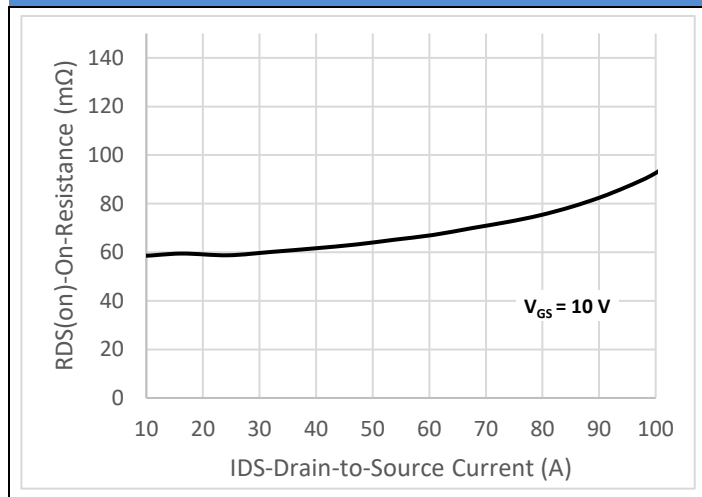


Fig.3 On-Resistance vs. Drain Current

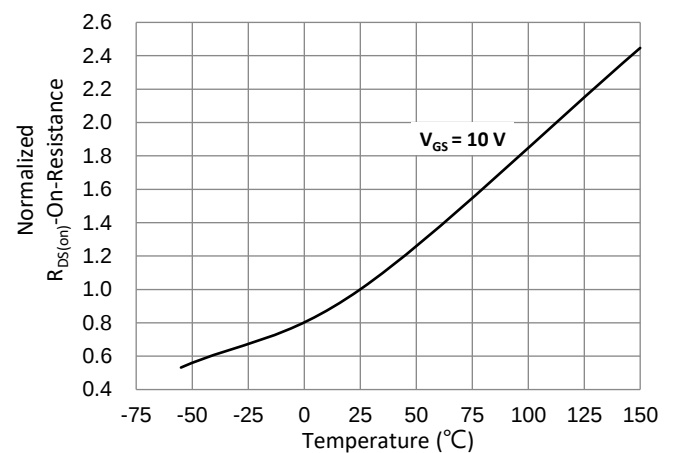


Fig.4 On-Resistance vs. Junction Temperature

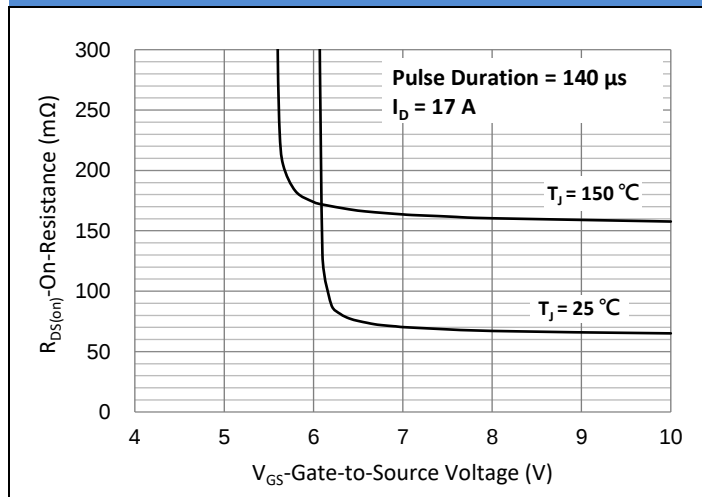


Fig.5 Capacitance vs. Drain-Source Voltage

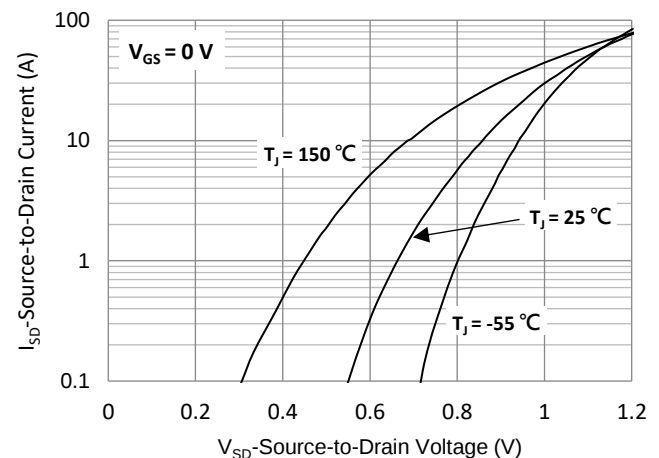
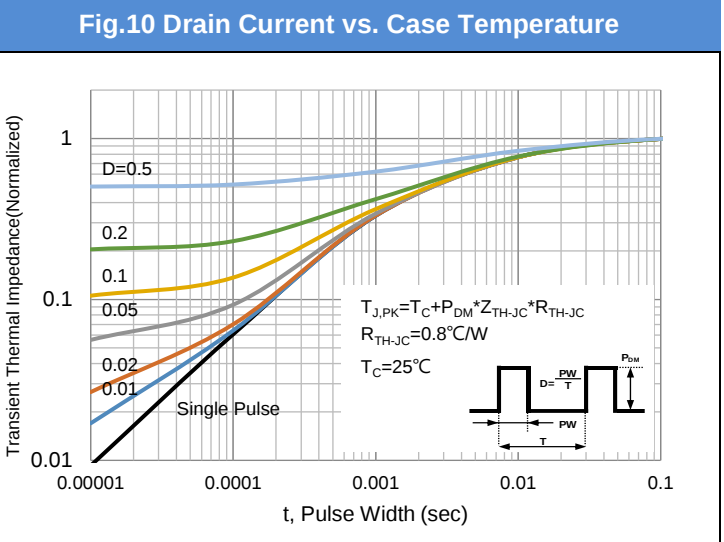
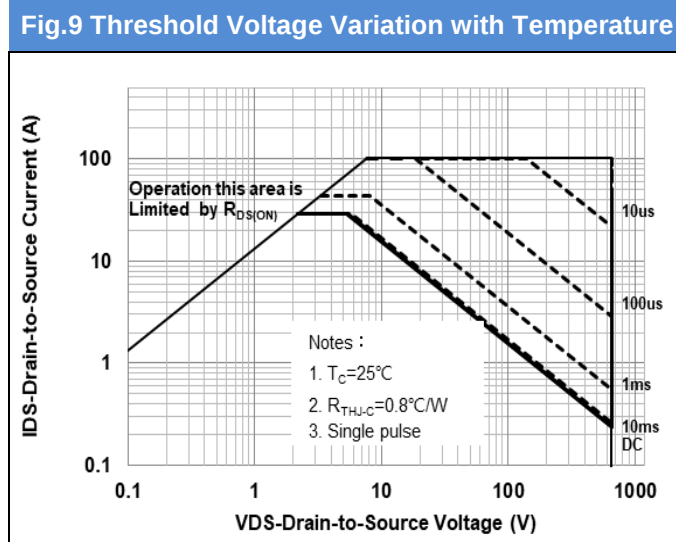
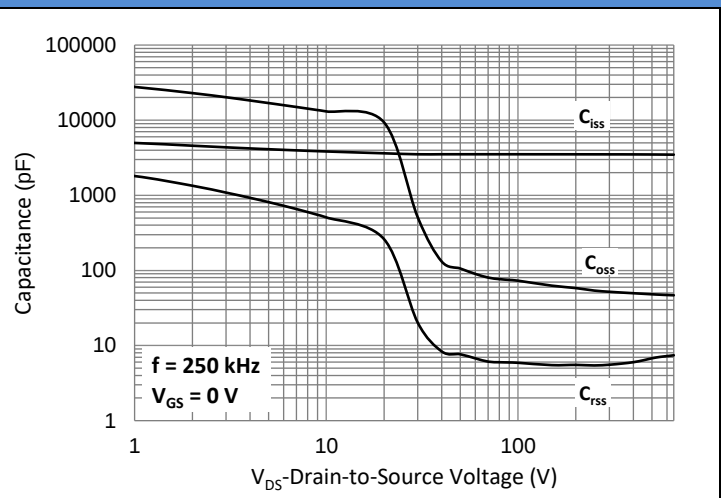
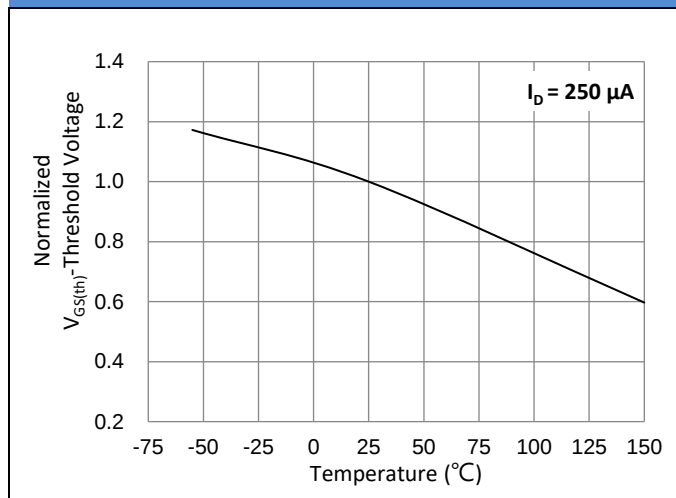
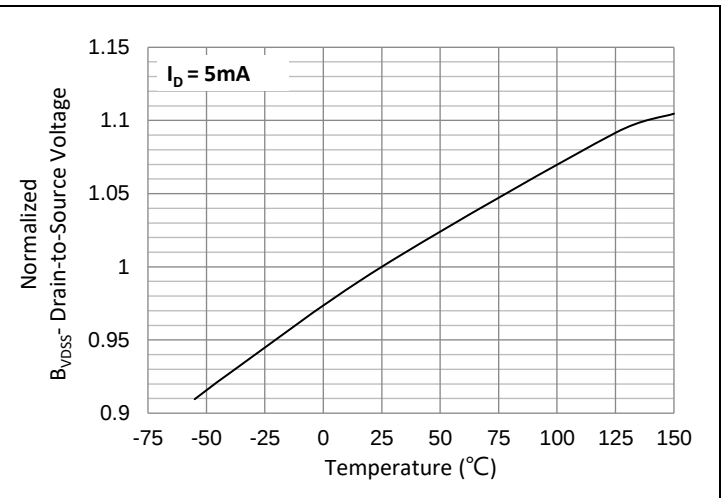
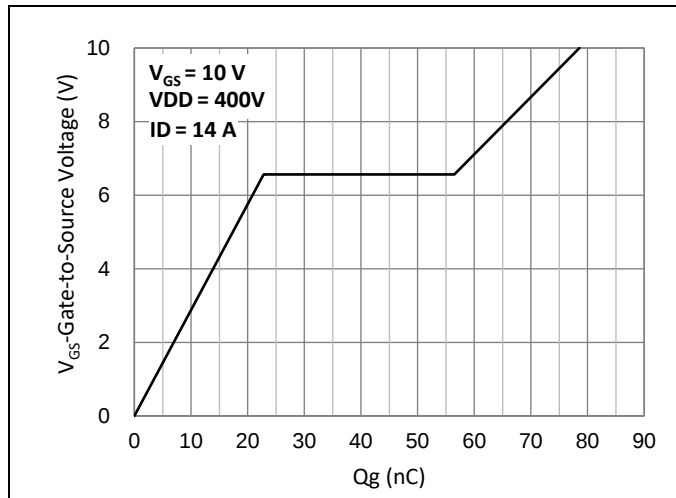


Fig.6 Source-Drain Diode Forward Voltage

TYPICAL CHARACTERISTIC CURVES



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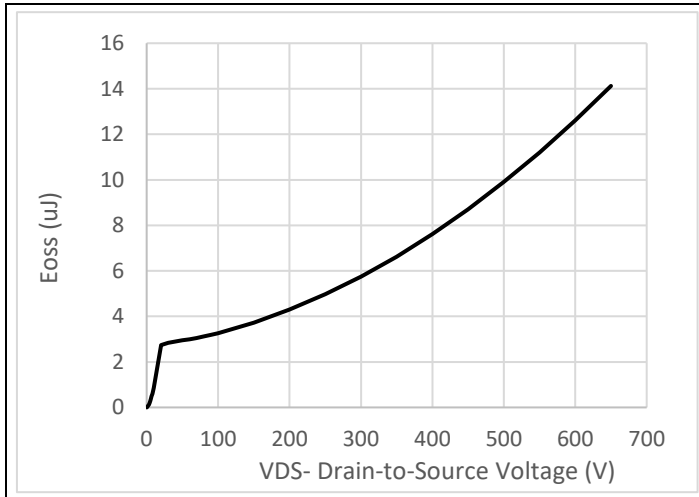
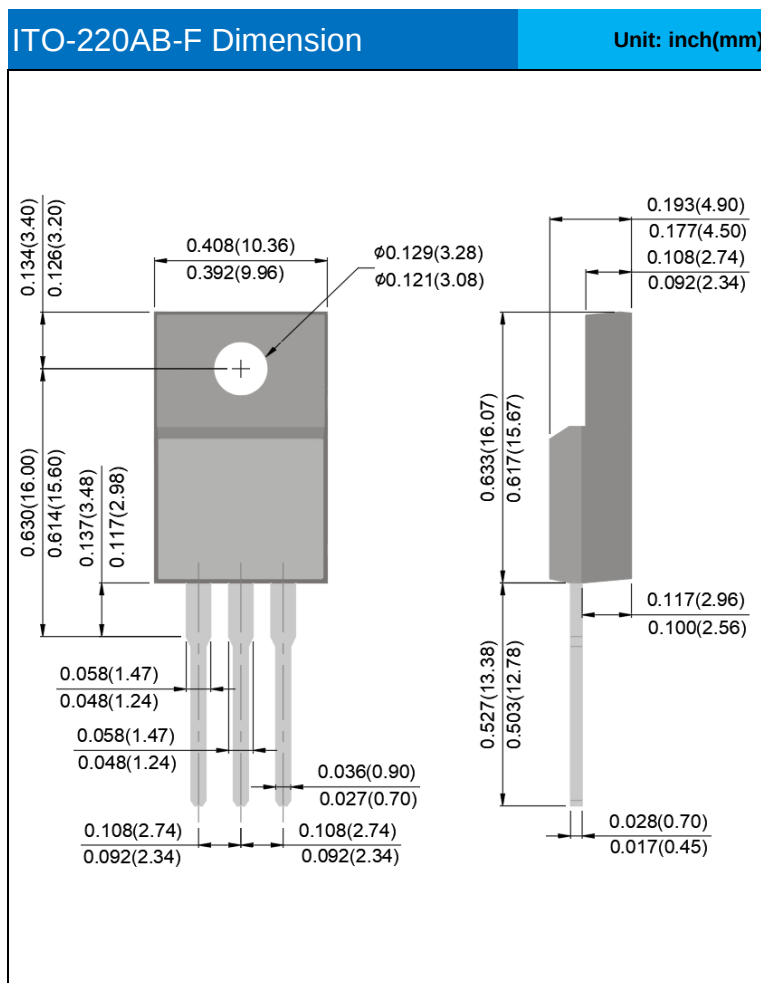


Fig.13 Typ. Coss Stored Energy

Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJMF080N65FR2	ITO-220AB-F	50pcs / Tube	080N65FR2

Packaging Information



Marking Diagram

PJ	Y = Year Code
080N65FR2	W = Week Code (A~Z)
YWLL x	LL = Lot Code (00~99)
	x = Production Line Code

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