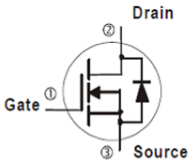
650V N-Channel Super Junction MOSFET

Voltage	**650 V**	**Rdson**	**140 mΩ**
Current	**25 A**	**Qg**	**48 nC**

ITO-220AB-F



Feature:

- $R_{DS(ON)\ Max}$, V_{GS}@10V : 140mΩ
- Easy to use/driver
- 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: Solder able per MIL-STD-750, Method 2026
- Approx. Weight: 2 grams

Application

- PFC, LED Power, PC Power, PD Charger, Adapter, UPS

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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current	T_C=25°C	I_D	25	A
	T_C=100°C		15	
Pulsed Drain Current	T_C=25°C	I_{DM}	75	A
Single Pulse Avalanche Energy (Note 6)		E_{AS}	180	mJ
MOSFET dv/dt ruggedness		dv/dt	50	V/ns
Reverse diode dv/dt		dv/dt	50	V/ns
Power Dissipation	T_C=25°C	P_D	69	W
	T_C=100°C		28	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~150	°C

Thermal Characteristics

PARAMETER		SYMBOL	VALUES	UNITS
Thermal Resistance	Junction-to-Case (Bottom)	$R_{\theta JC}$	1.8	°C/W
	Junction-to-Ambient (Note 3)	$R_{\theta JA}$	62.5	°C/W

Electrical Characteristics (T_A = 25 °C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	650	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	3.0	4.0	5.0	
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=12 A (Note 1)	-	116	140	mΩ
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V	-	-	10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
Dynamic (Note 5)						
Total Gate Charge	Q_g	V_{DS}=480V, I_D=12A, V_{GS}=0V to 10V	-	48	-	nC
Gate-Source Charge	Q_{gs}		-	13.5	-	
Gate-Drain Charge	Q_{gd}		-	21	-	
Input Capacitance	Ciss	V_{DS}=400V, V_{GS}=0V, f=250KHz	-	2032	-	pF
Output Capacitance	Coss		-	37	-	
Reverse Transfer Capacitance	Crss		-	3.2	-	
Effective Output Capacitance Energy Related	$C_{o(er)}$	V_{DS}=0V to 400V, V_{GS}=0V, (Note 4)	-	67	-	pF
Turn-On Delay Time	$td_{(on)}$	V_{DD}=400V, I_D=12A, V_{GS}=10V, Rg=25Ω (Note 2)	-	53	-	ns
Turn-On Rise Time	t_r		-	47	-	
Turn-Off Delay Time	$td_{(off)}$		-	156	-	
Turn-Off Fall Time	t_f		-	25	-	
Gate Resistance	Rg	f=1.0MHz	-	4.1	-	Ω
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	T_C=25℃	-	-	25	A
Diode Forward Voltage	V_{SD}	I_S=12A, V_{GS}=0V	-	0.88	-	V
Reverse Recovery Charge	Q_{rr}	I_S=12A di/dt=100A/μs	-	0.84	-	uC
Reverse Recovery Time	T_{rr}		-	115	-	ns

NOTES :

1. Pulse width≤300us, Duty cycle≤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. $C_{o(er)}$ is a capacitance that gives the same stored energy as Coss 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 mH, I_{AS} = 6A, V_{DD} = 50 V, V_{GS} = 10 V,Rg=25ohm.

TYPICAL CHARACTERISTIC CURVES

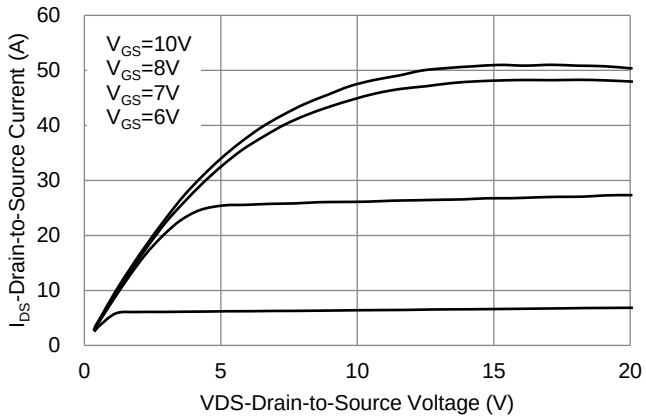


Fig.1 Output Characteristics

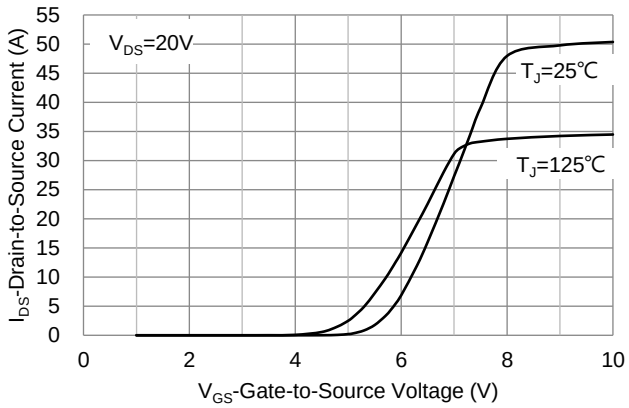


Fig.2 Transfer Characteristics

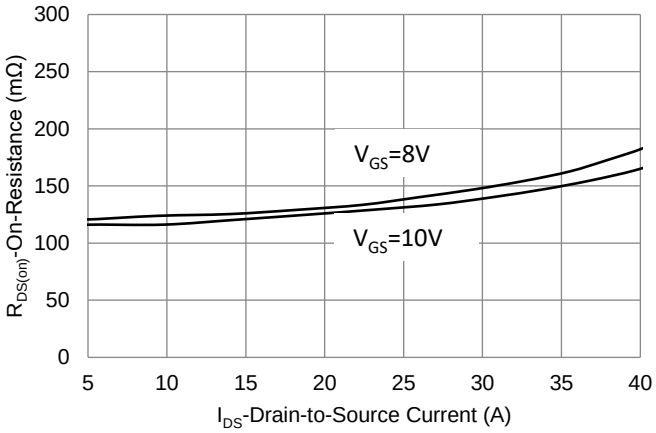


Fig.3 On-Resistance vs. Drain Current

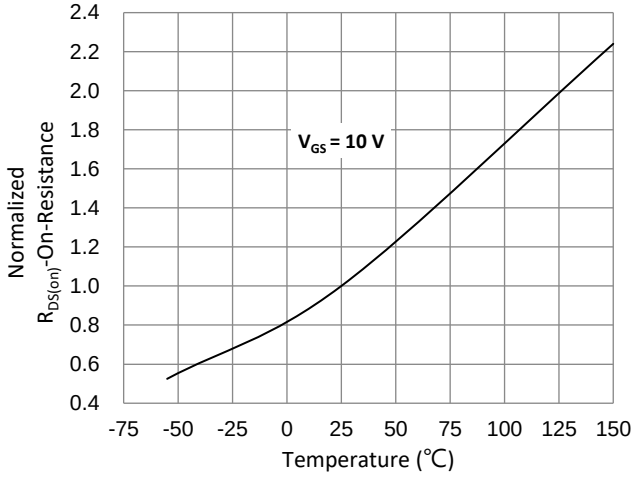


Fig.4 On-Resistance vs. Junction Temperature

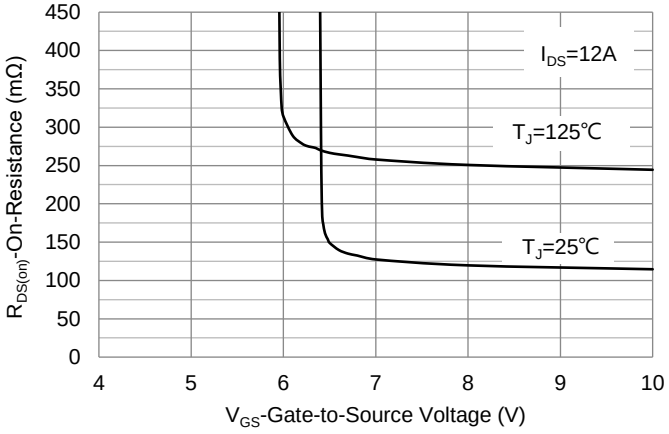


Fig.5 On-Resistance Variation with V_{GS}

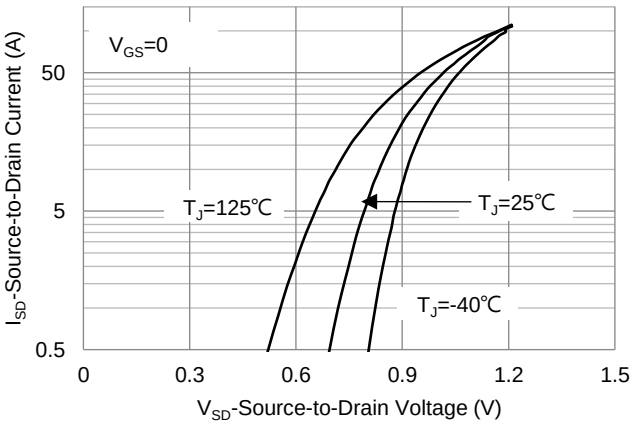


Fig.6 Body Diode CharacterIsIcs

TYPICAL CHARACTERISTIC CURVES

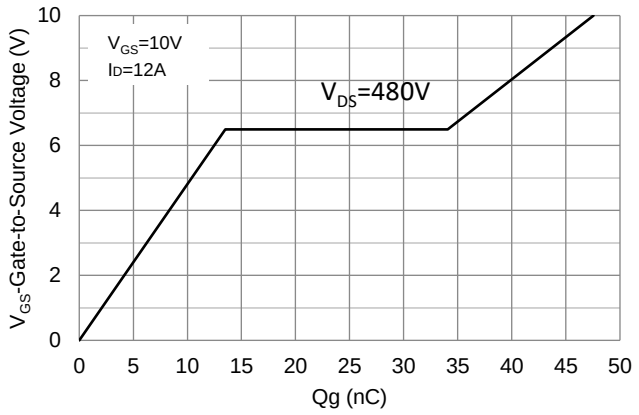


Fig.7 Gate-Charge Characteristics

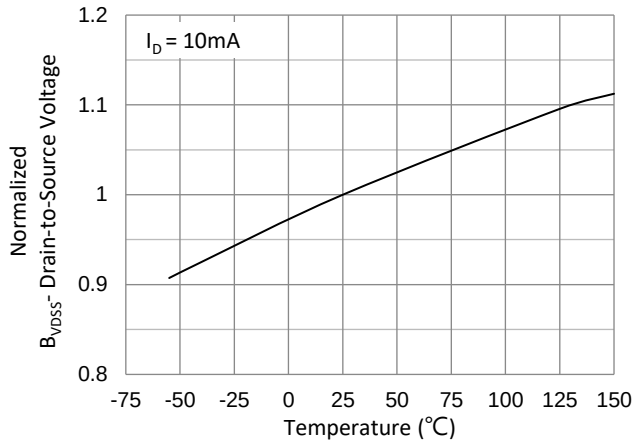


Fig.8 Breakdown Voltage Variation vs. Temperature

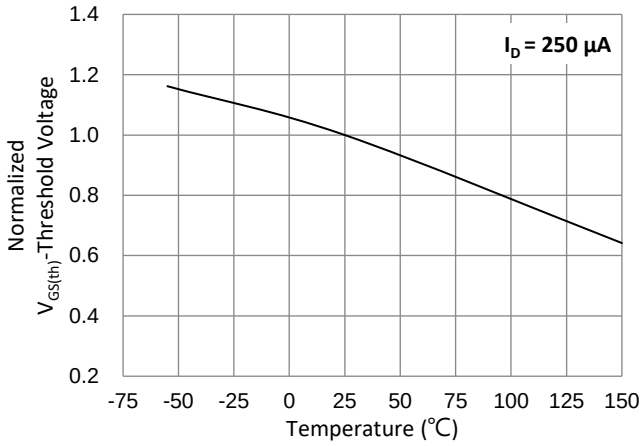


Fig.9 Threshold Voltage Variation with Temperature

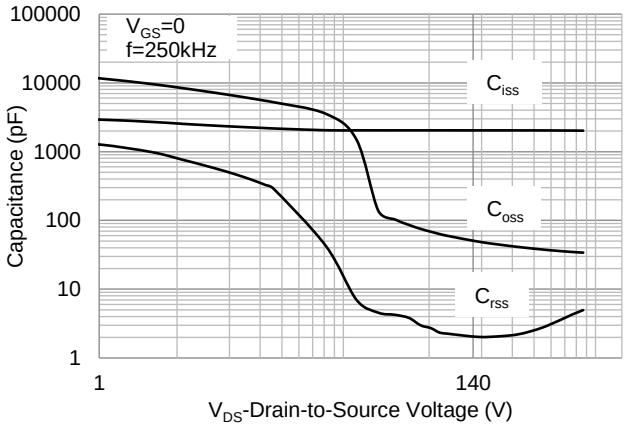


Fig.10 Typ. Coss Stored Energy

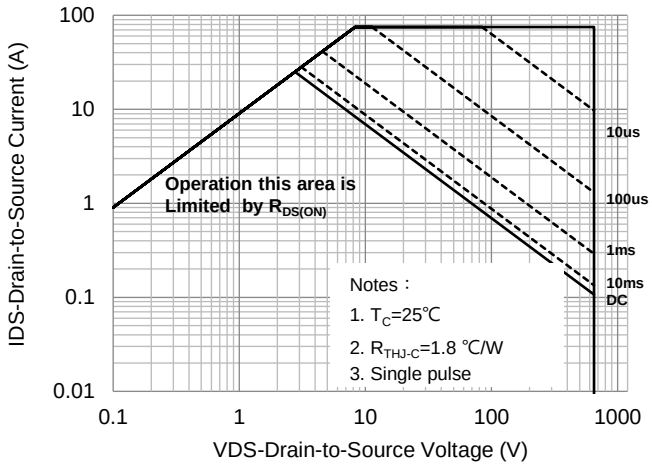


Fig.11 Maximum Safe Operating Area

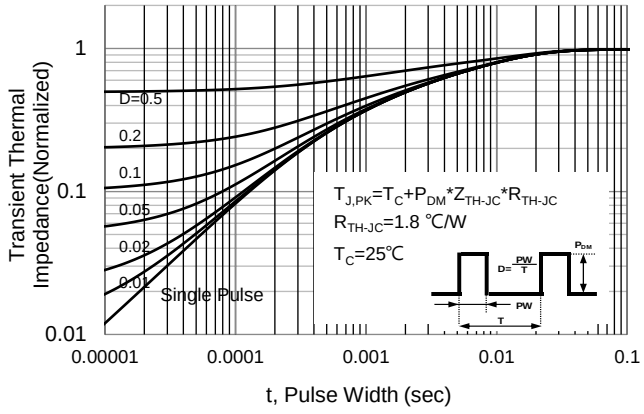


Fig.12 Normalized Transient Thermal Impedance

TYPICAL CHARACTERISTIC CURVES

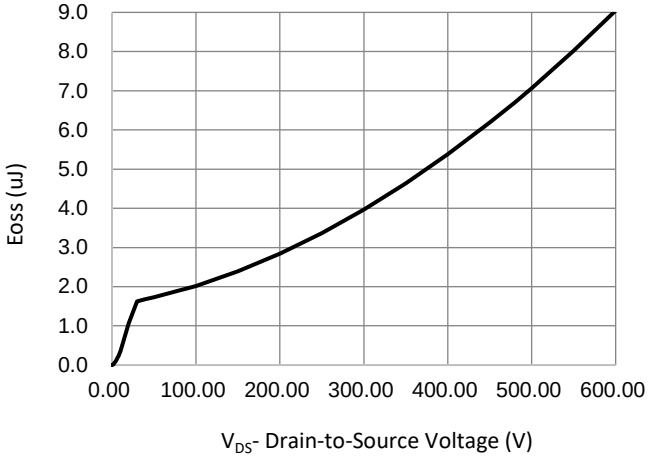


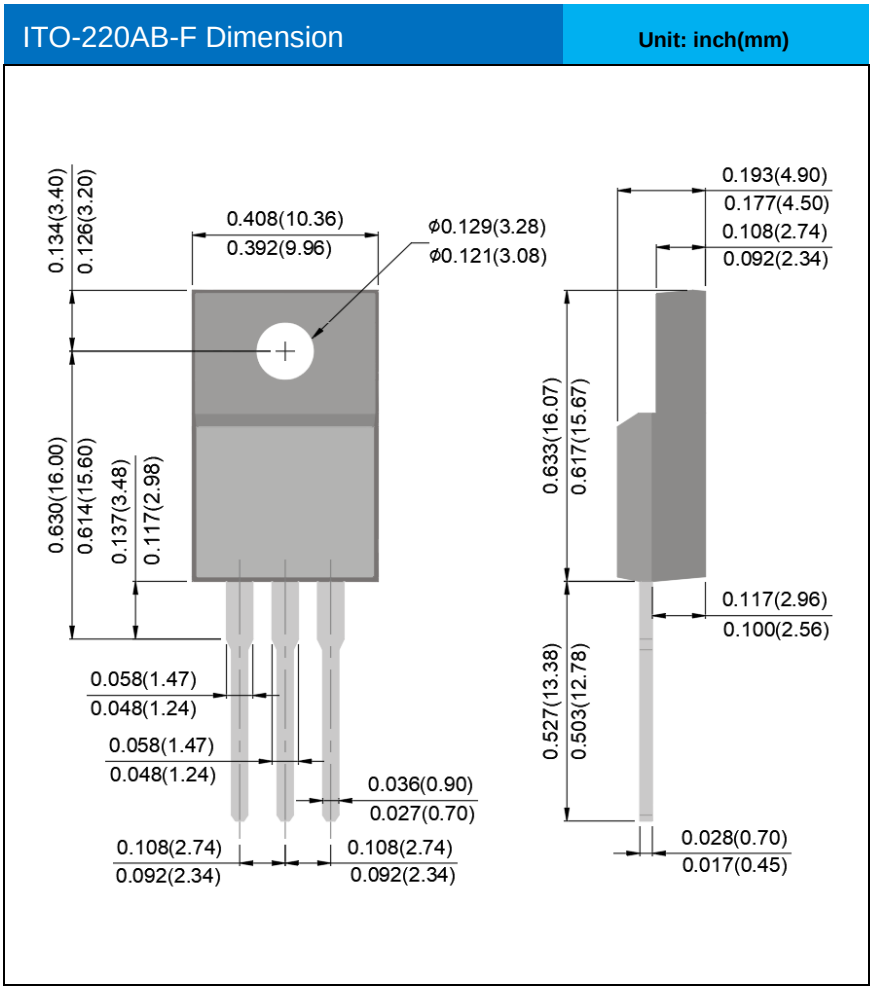
Fig.13 Typ. Coss Stored Energ

Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PDMF65R140FRC1	ITO-220AB-F	50pcs / Tube	65R140FC

Packaging Information

ITO-220AB-F Dimension — Unit: inch(mm)



Marking Diagram

PJ
65R140FC
YWLL x

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

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