PF280JN65C

RoHS COMPLIANT

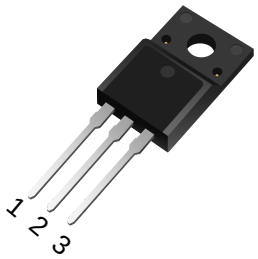
TO-220F Plastic-Encapsulate MOSFETS

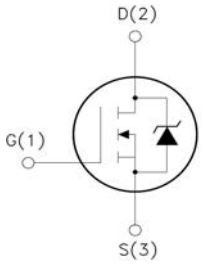
650V N-Channel COOLMOS

FEATURE

- ☐ Super Junction technology
- ☐ Much lower Ron*A Performance for On-state efficiency
- ☐ Better efficiency due to very low FOM
- ☐ Ultra Low Gate Charge:Qg=40.5nC (Typ.)
- ☐ VDSS=650V, ID=15A
- ☐ Rds(on):262mΩ(Typ.) @VG=10V
- ☐ 100% Avalanche Tested

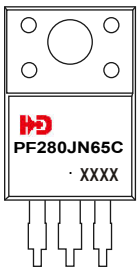
TO-220F





1.Gate (G)
2.Drain (D)
3.Source (S)

MARKING



PF280JN65C= Device code.
Solid dot = Green molding compound device, if none, the normal device.
XXXX = Code.

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	650	V
Continuous drain current [1)] T_C = 25°C T_C = 100°C	I_D	 15 11	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax}) [2)]	$I_{D\ pulse}$	65	A
Avalanche energy, single pulse (L=60mH, Rg=30Ω)	E_{AS}	120	mJ
Gate-Source voltage	V_{GS}	±30	V
Recovery diode dv/dt [3)]	dv/dt	50	V/ns
Power dissipation (T_C = 25°C)	P_{tot}	26	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal resistance, junction – case. Max	R_{thJC}	4.89	°C/W
Thermal resistance, junction – ambient. Max	R_{thJA}	78	

1) Limited by $T_{j,max}$. Maximum Duty Cycle D = 0.50,TO-252 equivalent
2) Pulse width t_p limited by $T_{j,max}$
3) Identical low side and high side switch with identical R_g

ELECTRICAL CHARACTERISTICS (T_a=25℃ unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	650	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	3		3.8	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=650V,V_{GS}=0V T_C=25°C
		-	10	-		T_C=150°C
Gate-source leakage current	I_{GSS}	-	0.49	80	nA	V_{GS}=±30V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	262	280	mΩ	V_{GS}=10V, I_D=7.5A, T_C=25°C
		-	0.6	-		T_C=150°C
Transconductance	g_{fs}	-	16	-	S	V_{DS}=20V,I_D=7.5A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	771	1125	pF	V_{GS}=0V, V_{DS}=100V, f=1MHz
Output Capacitance	C_{oss}	-	45	68		
Reverse Transfer Capacitance	C_{rss}	-	28	36		
Gate Total Charge	Q_G	-	24	-	nC	V_{GS}=10V, V_{DS}=480V, I_D=7.5A, f=1MHz
Gate-Source charge	Q_{gs}	-	4.8	-		
Gate-Drain charge	Q_{gd}	-	9.5	-		
Turn-on delay time	$t_{d(on)}$	-	41	-	ns	T_j=25°C, V_{GS}=10V, I_D=7.5A, V_{DS}=400V, R_g=25Ω
Rise time	t_r	-	38	-		
Turn-off delay time	$t_{d(off)}$	-	177	-		
Fall time	t_f	-	17	-		
Gate resistance	R_G	-	2.2	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	0.5	0.86	1	V	V_{GS}=0V,I_{SD}=7.5A
Body Diode Reverse Recovery Time	t_{rr}	-	260	-	ns	Isd=7.5A dI/dt=100A/us,Vds=100V
Body Diode Reverse Recovery Charge	Q_{rr}	-	2.94	-	uC	

Typical Characteristics

Fig 1. Output Characteristics (Tj=25℃)

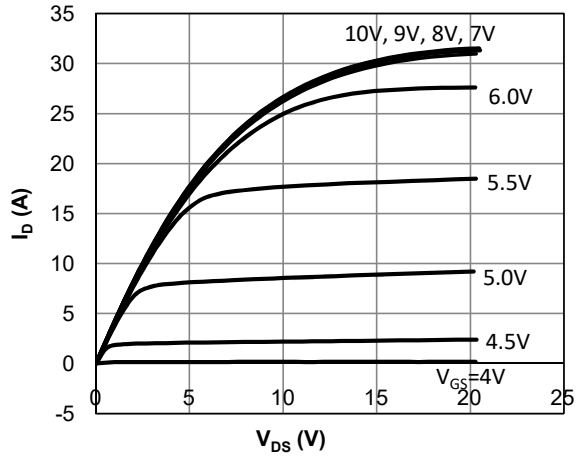


Fig 2. Output Characteristics (Tj=150℃)

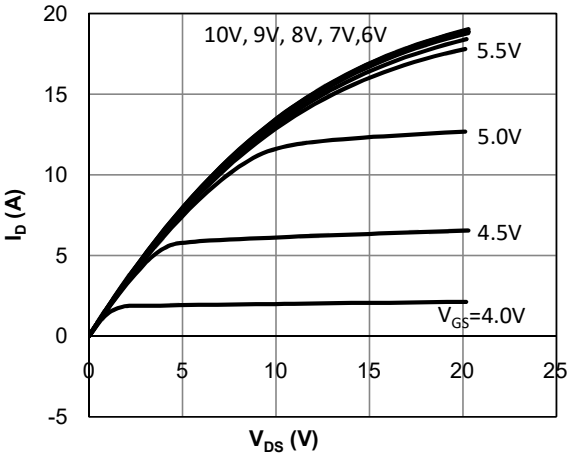


Fig 3: Transfer Characteristics

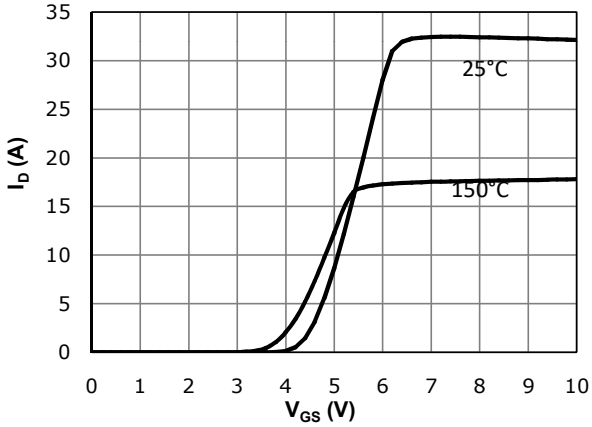


Fig 4: V_{TH} Vs Tj Temperature Characteristics

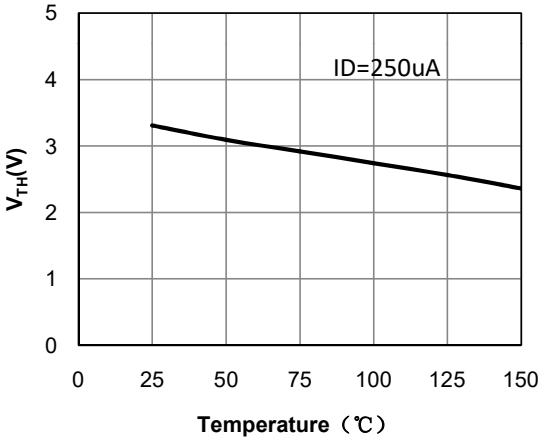


Fig 5: Rdson Vs Ids Characteristics(Tc=25℃)

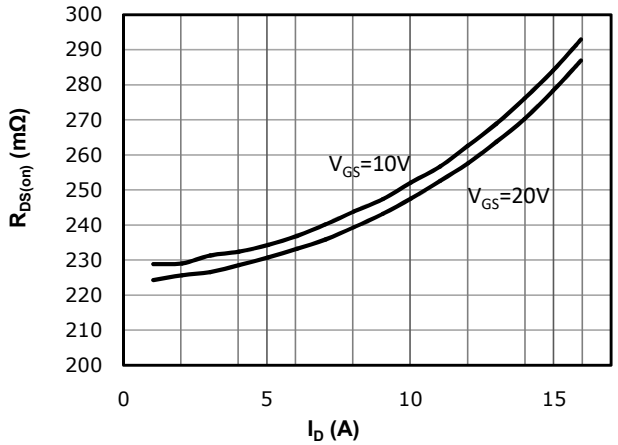


Fig 6: Rds(on) vs. Temperature

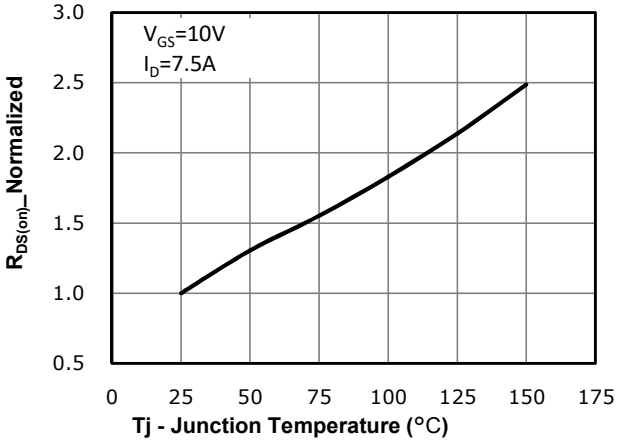


Fig 7: BVDSS vs. Temperature

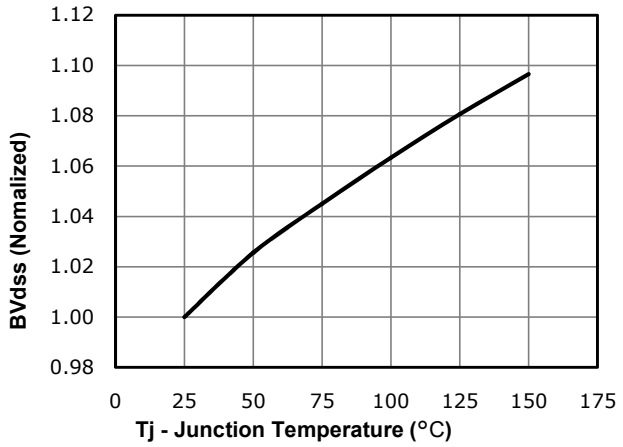


Fig 8: Rds(on) vs Gate Voltage

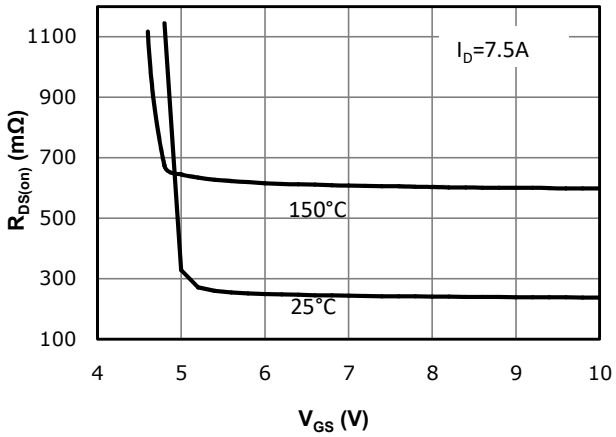


Fig 9: Body-diode Forward Characteristics

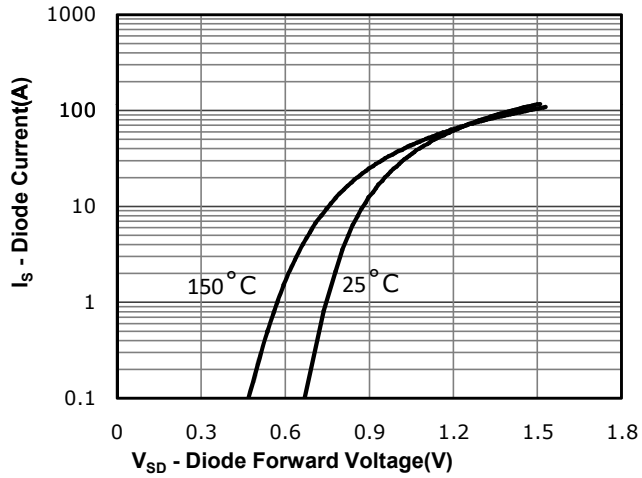


Fig 10: Gate Charge Characteristics

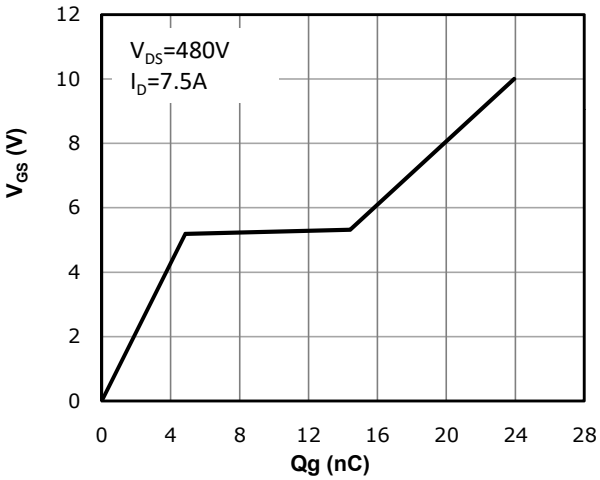


Fig 11: Capacitance Characteristics

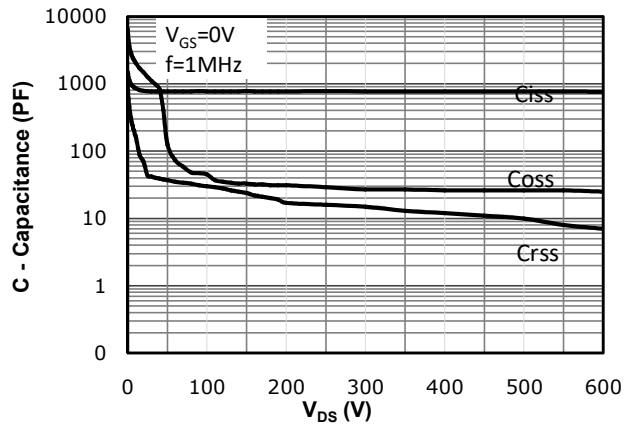
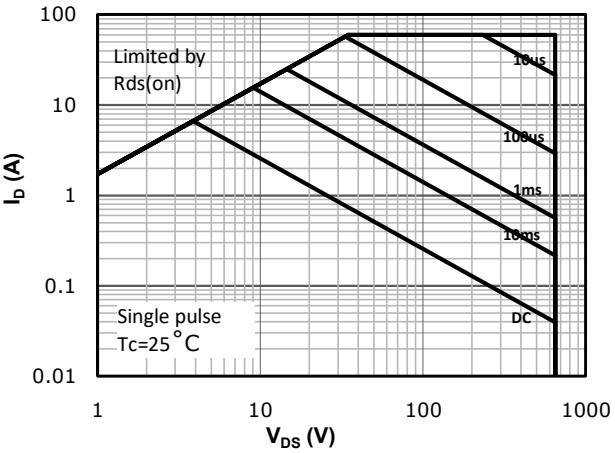
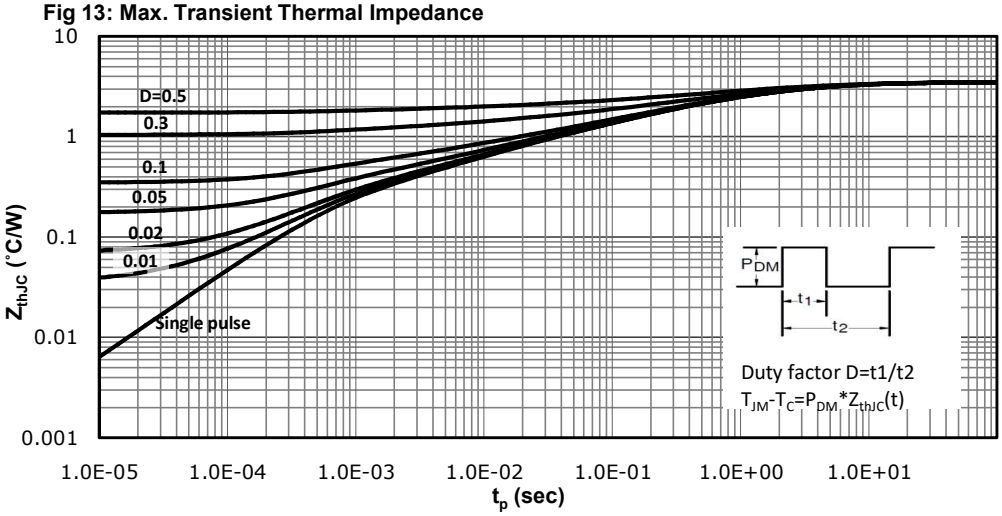


Fig 12: Safe Operating Area



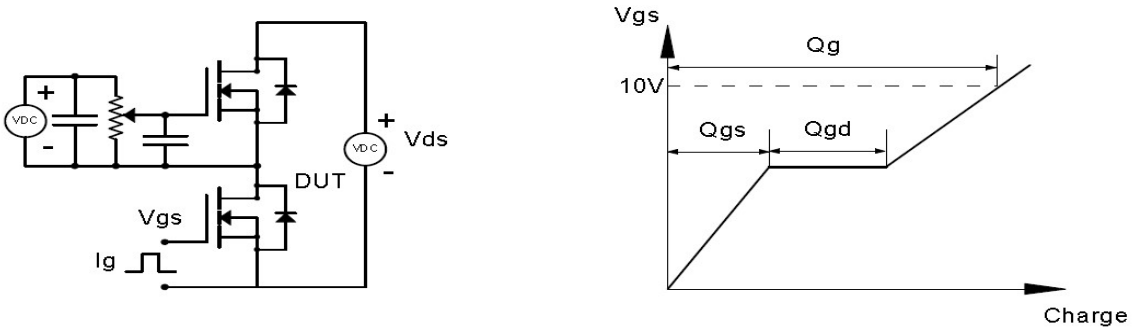
Typical Performance Characteristics

Fig 13: Max. Transient Thermal Impedance

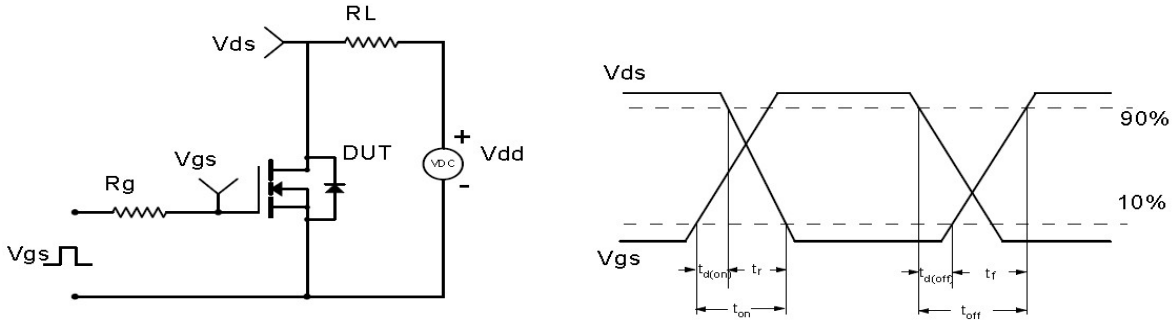


Test Circuit & Waveform

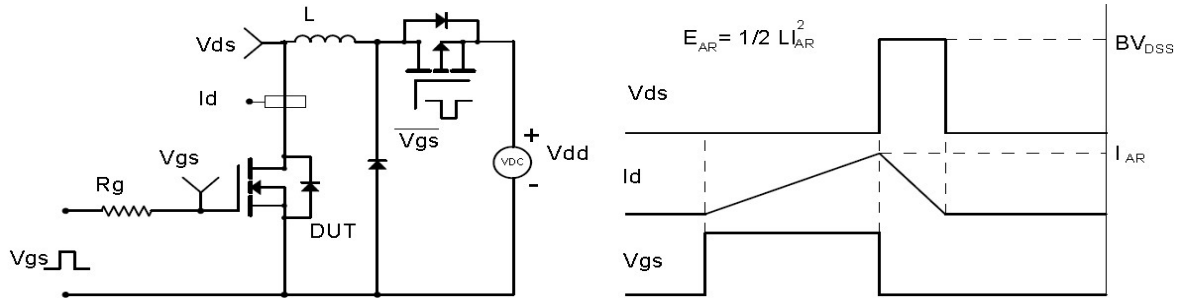
Gate Charge Test Circuit & Waveform



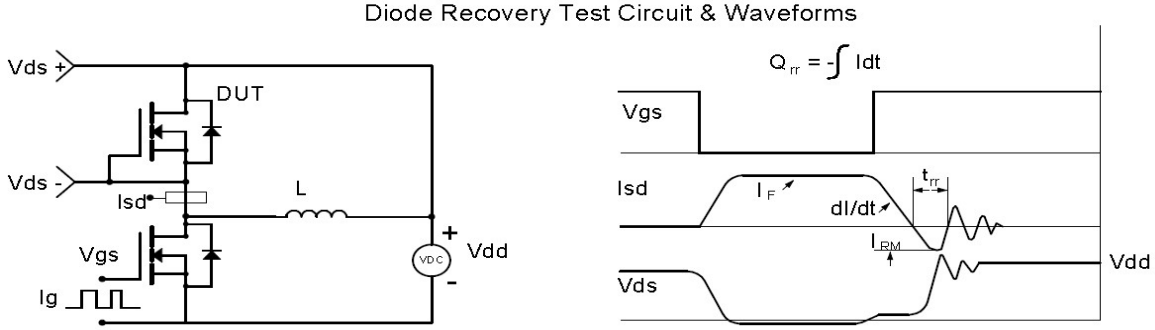
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



TO-220F

Unit: mm