PFP15T110 / PFB15T110

150V N-Channel MOSFET

FEATURES

- 100% EAS Test
- Super high density cell design
- Extremely Low Intrinsic Capacitances
- Remarkable Switching Characteristics
- Extended Safe Operating Area
- Lower $R_{DS(ON)}$: 8.2 mΩ (Typ.) @V_{GS}=10V

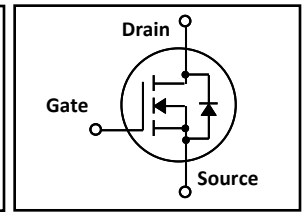
APPLICATION

- DC Motor control for E-bike & Power tools
- Amplifier and car booster
- Load Switch
- DC-DC converters

BV_{DSS} = 150 V

$R_{DS(on)}$ = 8.2 mΩ

I_D = 110 A



TO-220

1.Gate 2. Drain 3. Source

D2-PAK

1.Gate 2. Drain 3. Source

Absolute Maximum Ratings

T_j=25℃ unless otherwise specified

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	150	V
V_{GSS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current (T_C = 25℃)	110	A
	Continuous Drain Current (T_C = 100℃)	93	A
I_{DM}	Pulsed Drain Current	440	A
E_{AS}	Single Pulsed Avalanche Energy	1296	mJ
P_D	Maximum Power Dissipation (T_C = 25℃)	320	W
	Maximum Power Dissipation (T_C = 70℃)	223	W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.47	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +175	℃
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	℃

Package Marking and Ordering Information

Marking	Device	Package	Remark
NCEP15T11	PFP15T110	TO-220	RoHS
NCEP15T11D	PFB15T110	TO-263(D2-PAK)	RoHS

Electrical Characteristics T_C=25 °C unless otherwise specified

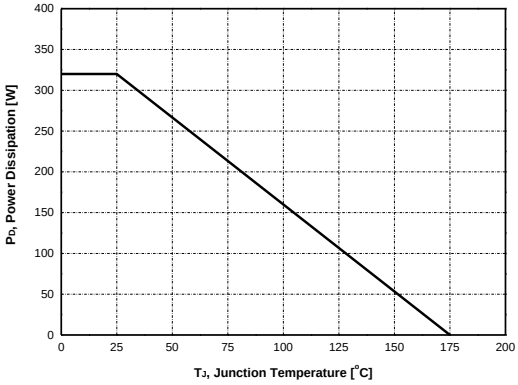
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 uA	2.0	--	4.0	V
$R_{DS(ON)}$	Drain-Source On-Static Resistance	V_{GS} = 10 V, I_D = 55 A, T_C = 25℃	--	8.2	9.0	mΩ
g_{FS}	Forward Transconductance	V_{DS} = 10 V, I_D = 55 A	70	-	-	V
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 uA	150	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 120 V, V_{GS} = 0 V	--	--	1	uA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 20 V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -20 V, V_{DS} = 0 V	--	--	-100	nA
V_{SD}	Diode Forward Voltage	I_S = 110 A, V_{GS} = 0 V	--	--	1.2	V
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=75 V, V_{GS}=0 V, f=1.0 MHz	--	5500	--	pF
C_{oss}	Output Capacitance		--	540	--	pF
C_{rss}	Reverse Transfer Capacitance		--	5	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Time	V_{DD} = 75 V, I_D = 55 A, V_{GS} = 10 V, R_G = 4.7 Ω	--	25	--	ns
t_r	Turn-On Rise Time		--	35	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	46	--	ns
t_f	Turn-Off Fall Time		--	14	--	ns
Q_g	Total Gate Charge	V_{DS}=75 V, I_D=55 A, V_{GS}=10V	--	74	--	nC
Q_{gs}	Gate-Source Charge		--	32	--	nC
Q_{gd}	Gate-Drain Charge		--	7.3	--	nC

Notes ;

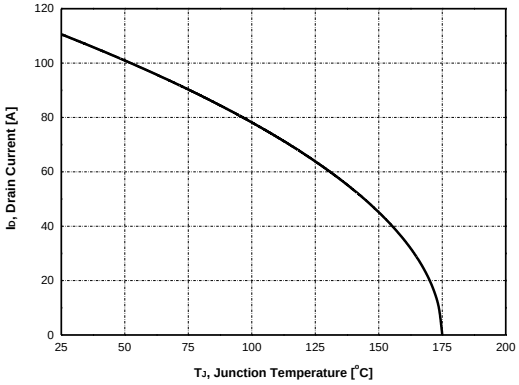
1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L=0.5mH, I_{AS}=110, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
4. Essentially Independent of Operating Temperature

Typical Characteristics

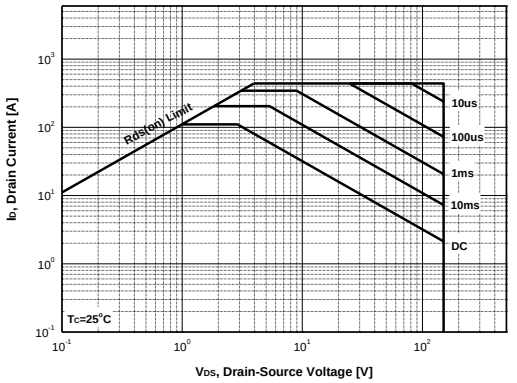
Power Dissipation



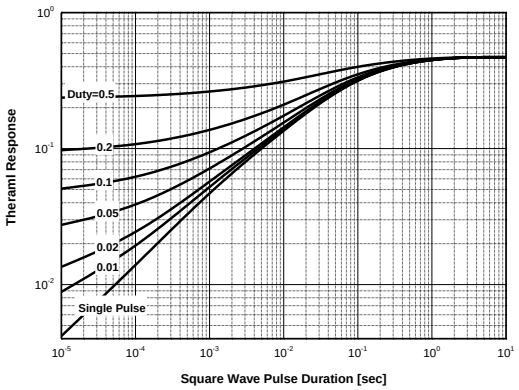
Drain Current



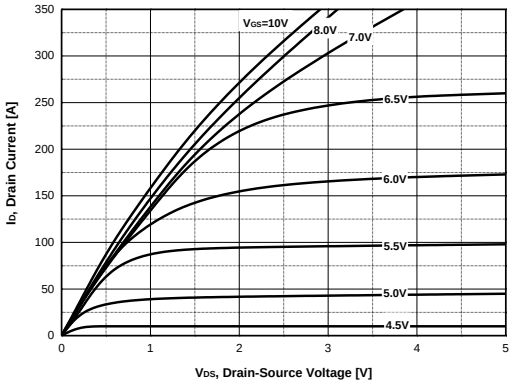
Safe Operation Area



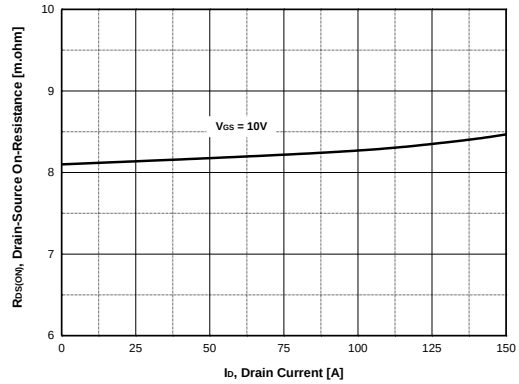
Thermal Transient Impedance



Output Characteristics

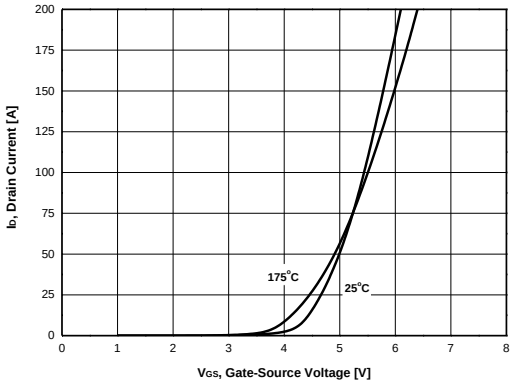


Drain-Source On Resistance

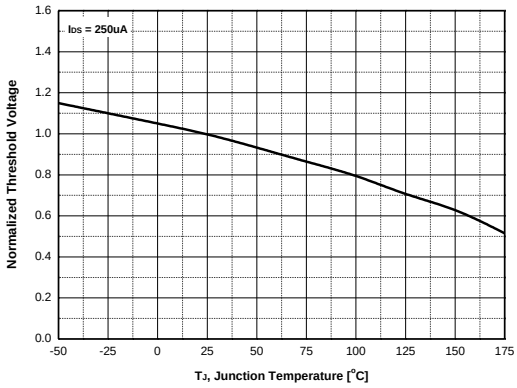


Typical Characteristics (continued)

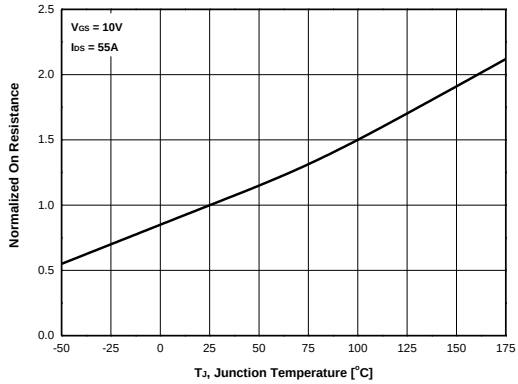
Transfer Characteristics



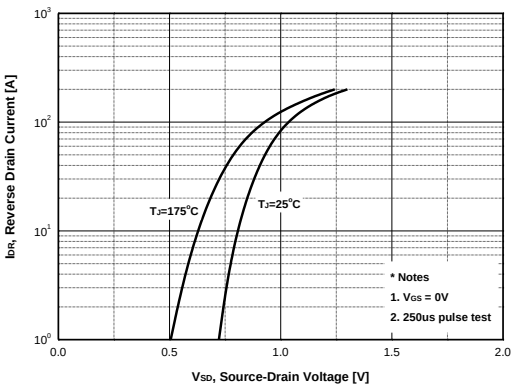
Gate Threshold Voltage



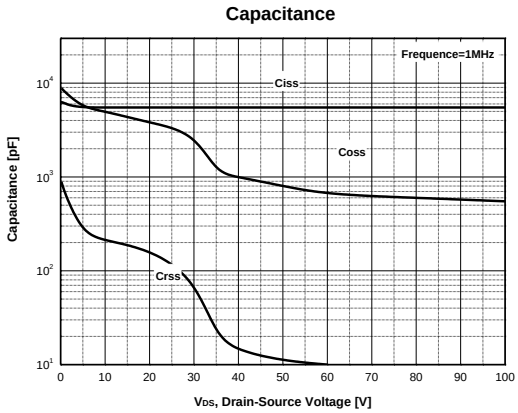
Drain-Source On Resistance



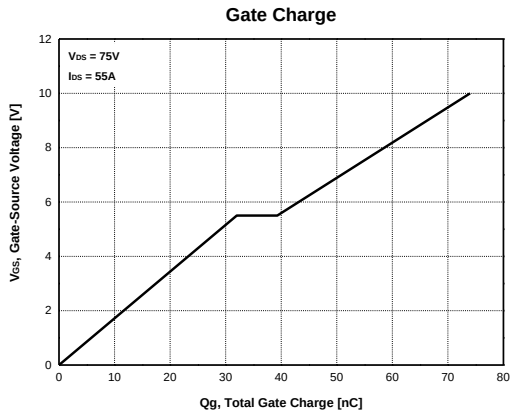
Source-Drain Diode Forward



Capacitance



Gate Charge



Characteristics Test Circuit & Waveform

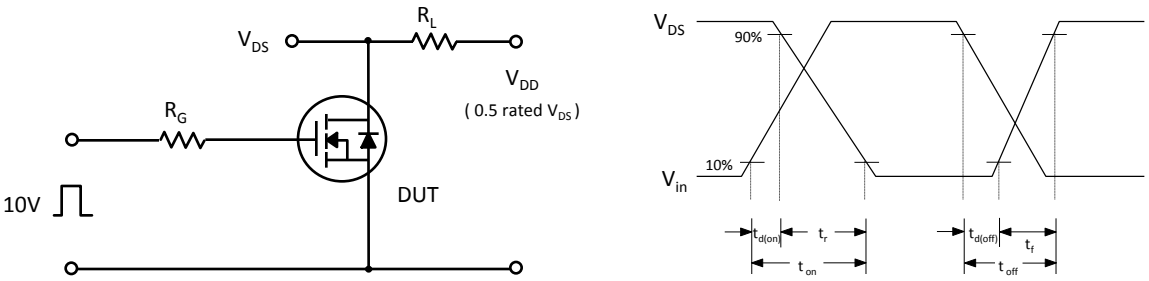


Fig 14. Resistive Switching Test Circuit & Waveforms

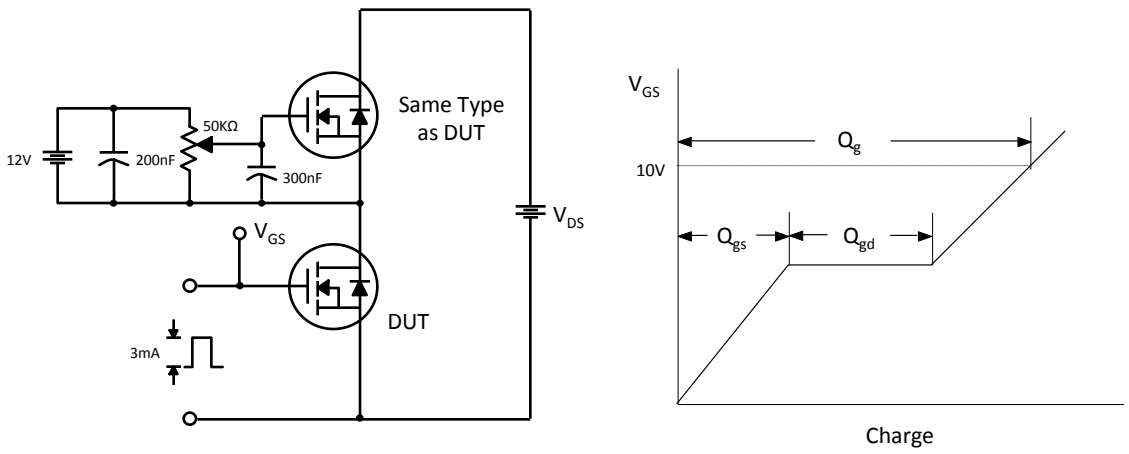


Fig 15. Gate Charge Test Circuit & Waveform

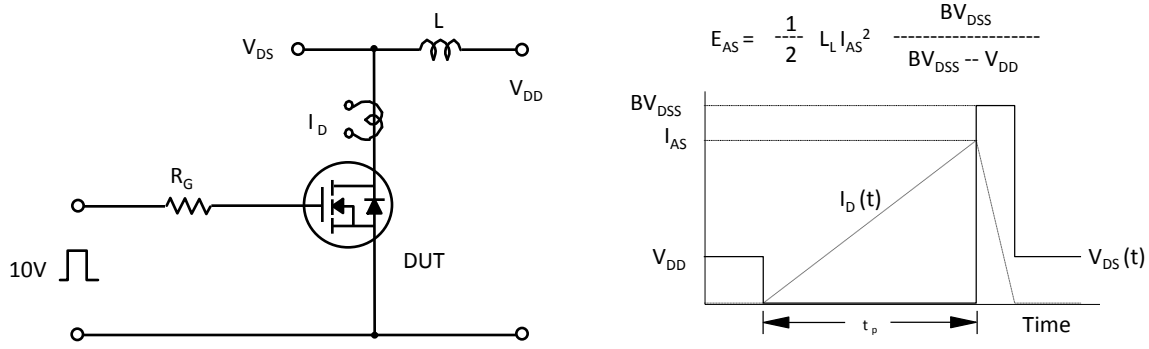
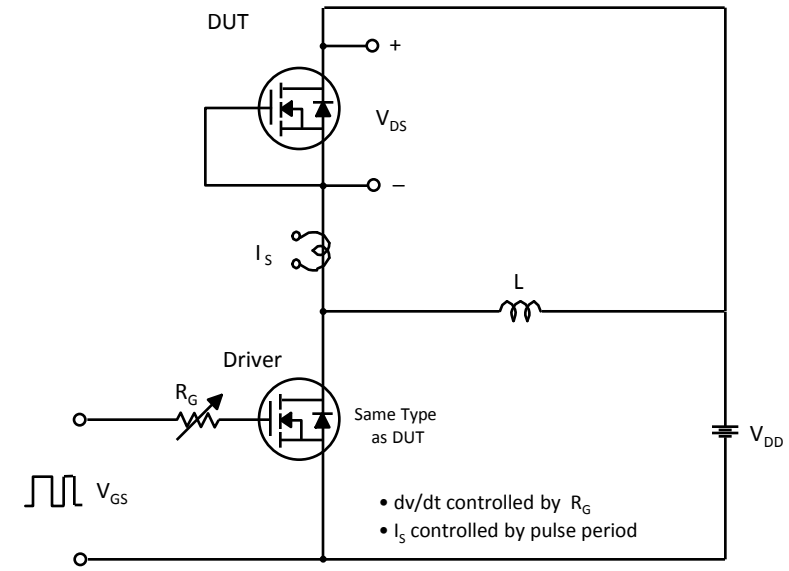


Fig 16. Unclamped Inductive Switching Test Circuit & Waveforms

Characteristics Test Circuit & Waveform (continued)



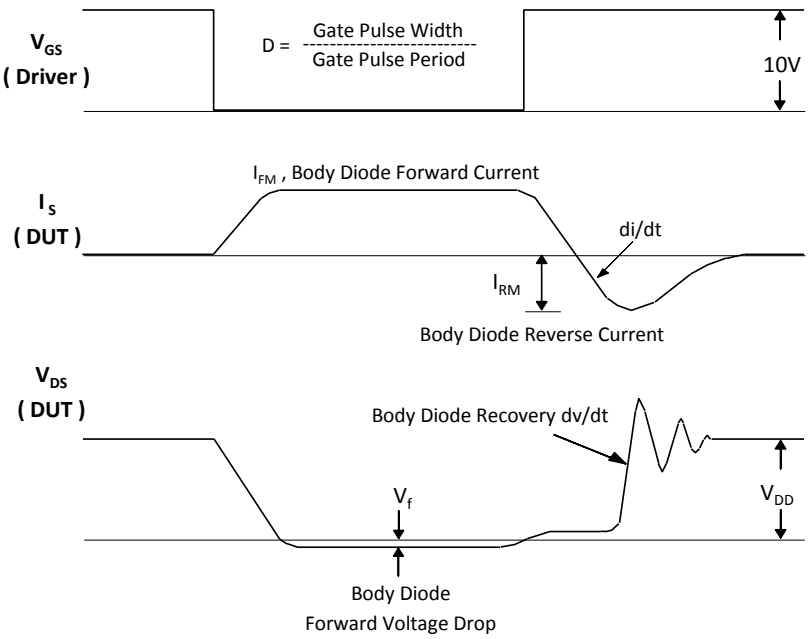


Fig 17. Peak Diode Recovery dv/dt Test Circuit & Waveforms