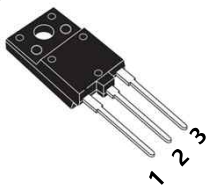
QFS9N90AFB

900V 9A 1.4Ω Si Planal MOSFET

General description

Symbol	Value
V_{DSS} @ T_C=25℃	Min 900V
I_D @ T_C=25℃	9.0A
$R_{DS(on)}$	Max 1.4Ω
Q_G	Typ 52nC

Package

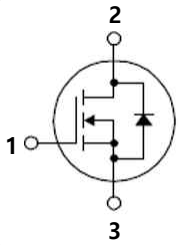


TO-3PF-3L

15.5 x 26.5 x 5.5 mm

Features

- Gate Charge(Typ. Q_G=52nC)
- High Voltage (Min. V_{DSS}=900V)
- 100% Avalanche Tested



1 : Gate
2 : Drain
3 : Source

Maximum Ratings (T_C = 25℃)

Parameter	Symbol	Test Condition	Value	Units
Drain-source voltage	V_{DSS}	V_{GS}=0V, I_D=250uA	900	V
Drain current (DC)	I_D	T_C=25℃	9.0	A
		T_C=100℃	5.7	A
Drain current (Pulsed)	I_{DM}	Pulse width limited by junction temperature	36	A
Gate-source voltage	V_{GS}	-	±30	V
Single pulsed avalanche energy	E_{AS}	I_{AS}=9.0A , R_G=25Ω, V_{DD}=50V, L=21mH	900	mJ
Power dissipation	P_D	T_C=25℃	130	W
Operating junction	T_j	-	-55 to 150	℃
Storage temperature	T_{stg}	-	-55 to 150	℃

Electrical Characteristics (T_j = 25℃)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	900	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=900V, V_{GS}=0V	-	-	1.0	uA
Gate-source leakage current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	3.0	-	5.0	V
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=4.5A	-	1.2	1.4	Ω
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V f =1MHz	-	2100	-	pF
Output capacitance	C_{oss}		-	175	-	
Reverse transfer capacitance	C_{rss}		-	14	-	
Total gate charge	Q_G	V_{DS}=720V, V_{GS}=10V, I_D=9A	-	52	68	nC
Gate-source charge	Q_{GS}		-	16		
Gate-drain charge	Q_{GD}		-	20	-	
Turn on delay time	$t_{d(on)}$	V_{DD}=450V, I_D=9A, R_G=25Ω	-	50	-	ns
Rise time	t_r		-	120	-	
Turn off delay time	$t_{d(off)}$		-	100	-	
Fall time	t_f		-	75	-	

Body Diode(Source – Drain) Electrical Characteristics (Tj = 25℃)

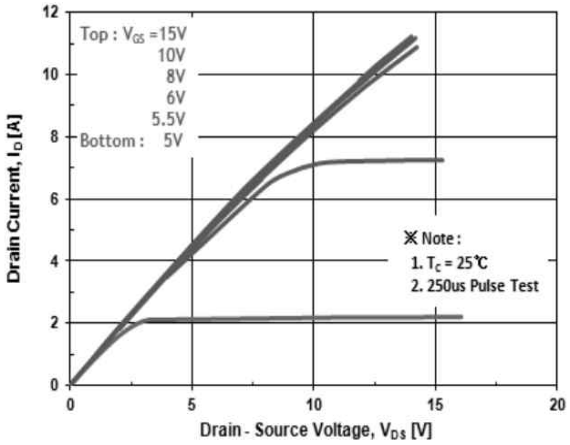
Parameter	Symbol	Test Condition	Value			Units
			Min	Typ	Max	
Continuous diode forward current	I_S	-	-	-	9.0	A
Maximum pulsed drain to source diode forward current	I_{SM}	-	-	-	36.0	A
Forward voltage	V_{SD}	I_{SD}=9A, V_{GS}=0V	-	-	1.4	V
Reverse recovery time	t_{rr}	I_{SD}=9A, V_{GS}=0V di/dt=100A/μs	-	550.0	-	ns
Reverse recovery charge	Q_{rr}		-	6.5	-	uC

Thermal Characteristics(T_C = 25℃)

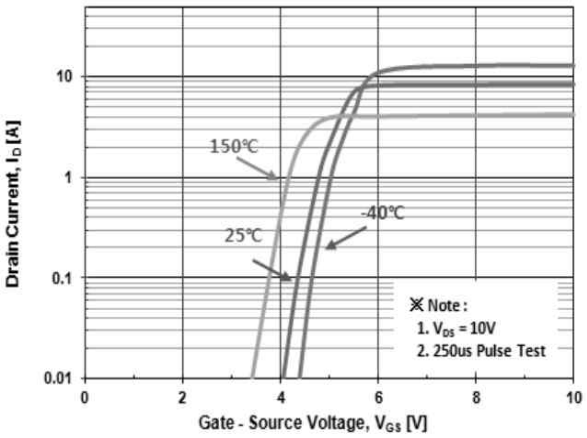
Symbol	Parameter	Typ	Max	Units
$R_{th(j-c)}$	Junction to case	-	0.96	℃/W

Typical Electrical Characteristics Curves (T_j = 25℃)

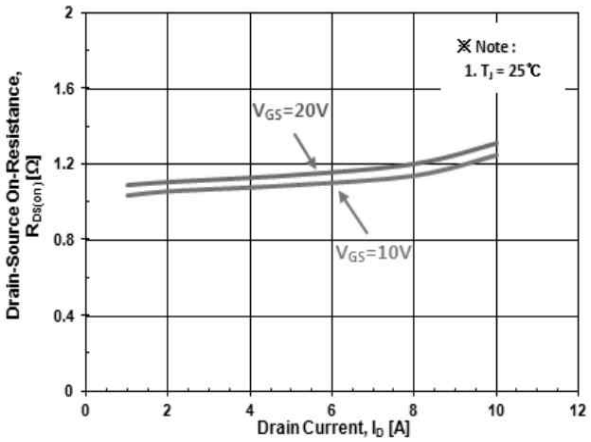
V_{DS} – I_D Characteristics



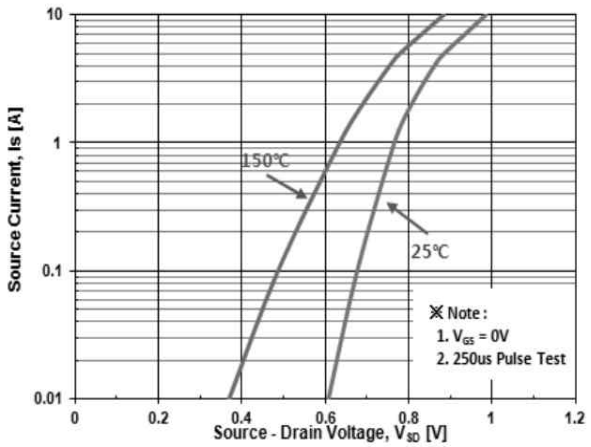
V_{GS} – I_D Characteristics



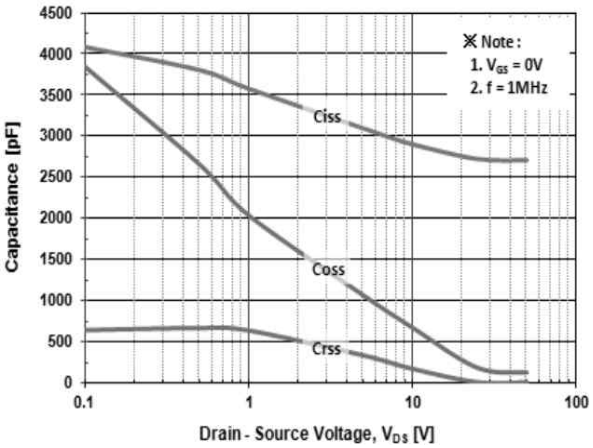
I_D – $R_{DS(on)}$ Characteristics



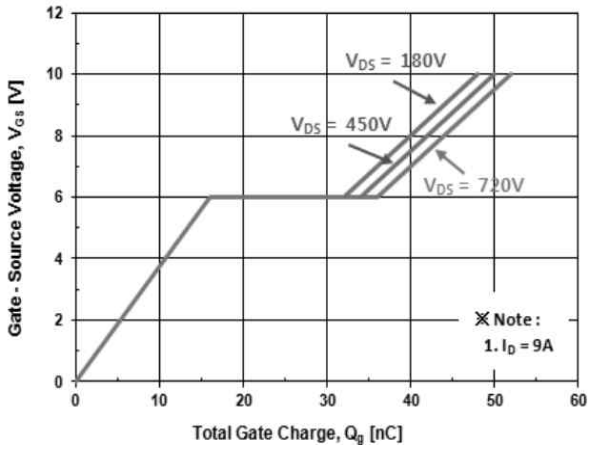
V_{SD} – I_S Characteristics



V_{DS} – C_T Characteristics

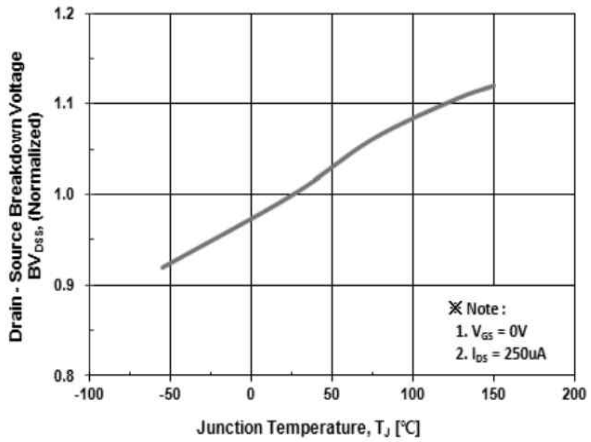


Q_g – V_{GS} Characteristics

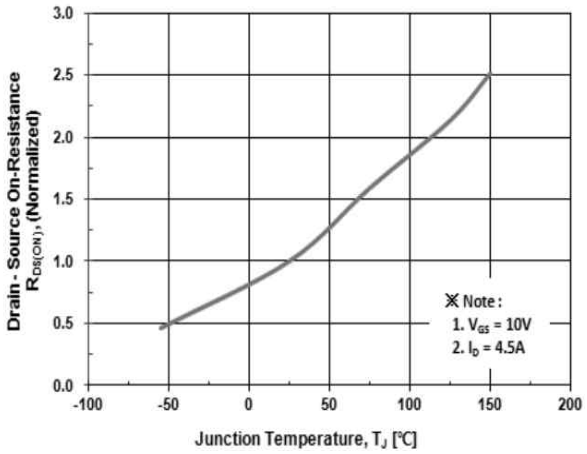


Typical Electrical Characteristics Curves (T_j = 25℃)

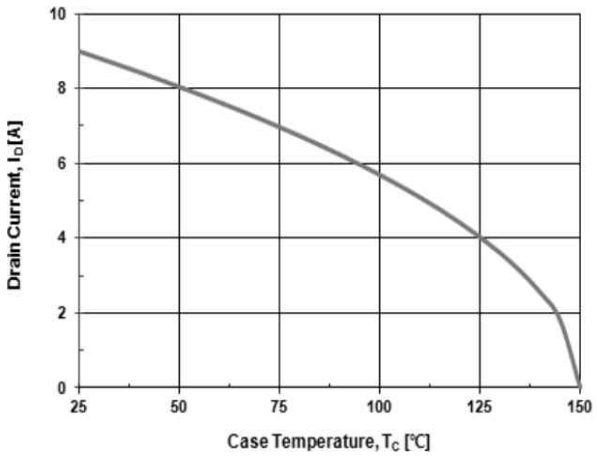
T_j – $V_{DSS(Normalized)}$ Characteristics



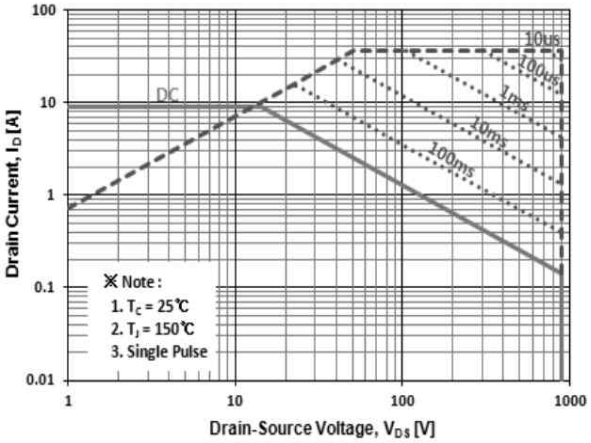
T_j – $R_{DS(on)(Normalized)}$ Characteristics



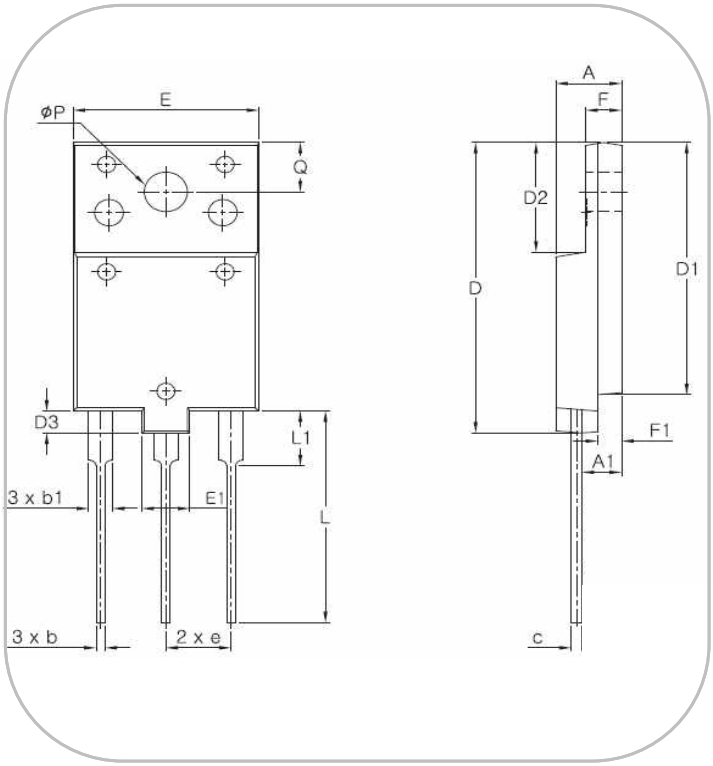
T_C – I_D Characteristics



SOA Characteristics



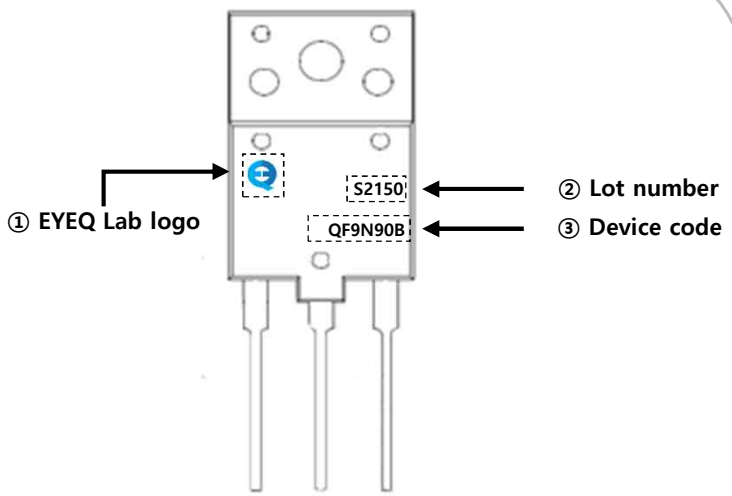
Package Dimensions(TO-3PF-3L)



[Unit : mm]

SYMBOL	MIN	MAX
A	5.30	5.70
A1	3.10	3.50
b	0.65	0.85
b1	1.80	2.20
c	0.80	1.00
D	26.30	26.70
D1	22.80	23.20
D2	9.80	10.20
D3	1.80	2.20
E	15.30	15.70
E1	3.80	4.20
e	5.15	5.75
F	2.80	3.20
F1	1.80	2.20
L	19.10	19.50
L1	4.80	5.20
Q	4.30	4.70
ϕP	3.40	3.80

Marking Information



① Company Logo

② Lot Number : 21 – 2021 Year , 50 – 50 Week

③ Device Code : Q – EYEQ Lab, F – MOSFET,
9 – 9A, N – NPN Type, 90 – 900V