



General Description

This product family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.

Features

- Low conduction loss due to low V_F
- Extremely low switching loss by tiny Q_c
- Highly rugged due to better surge current
- Industrial standard quality and reliability

Applications

- UPS
- Power Inverter
- High performance SMPS
- Power factor correction



Ordering Part Number	Package	Brand
NXPSC04650X6Q	TO-220F-2L	HXY MOSFET



Maximum Ratings (at $T_c = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	650	V
Surge Peak Reverse Voltage	V_{RSM}	650	V
DC Peak Reverse Voltage	V_R	650	V
Continuous Forward Current $T_c = 25^\circ\text{C}$ $T_c = 135^\circ\text{C}$ $T_c = 152^\circ\text{C}$	I_F	10 5 4	A
Repetitive Peak Forward Surge Current $T_c = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ $T_c = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$	I_{FRM}	23 15	A
Non-Repetitive Forward Surge Current $T_c = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ $T_c = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$	I_{FSM}	36 28	A
i^2dt value $T_c = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ $T_c = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$	$\int i^2 dt$	6.5 3.9	A^2s
Power dissipation $T_c = 25^\circ\text{C}$ $T_c = 110^\circ\text{C}$	P_{tot}	30 13	W
Operating junction Range	T_j	-55 to +175	$^\circ\text{C}$
Storage temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

Thermal Resistance

Parameter	Symbol	Typ.	Unit
Thermal resistance, junction – case.	R_{thJC}	4.90	$^\circ\text{C/W}$



Electrical Characteristics (at T_c = 25°C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Forward Voltage	V _F	-	1.3	1.5	V	I _F =4A T _J =25°C T _J =175°C
Reverse Current	I _R	-	10	50	μA	V _R =650V T _J =25°C T _J =175°C
Total Capacitive Charge	Q _C	-	10.6	-	nC	V _R =400V, T _J =25°C $Q_C = \int_0^{V_R} C(V) dV$
Total Capacitance	C	-	203	-	pF	T _J =25°C, f=1MHz V _R =0V V _R =200V V _R =400V

Characteristics Curve

Fig 1: Forward Characteristics

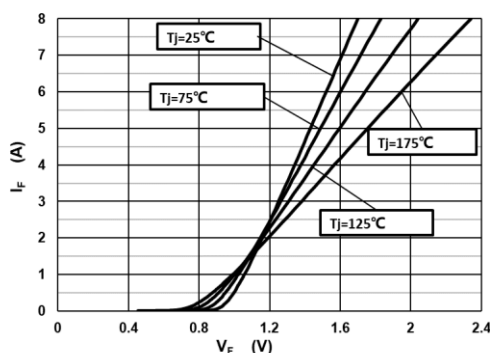


Fig 2: Reverse Characteristics

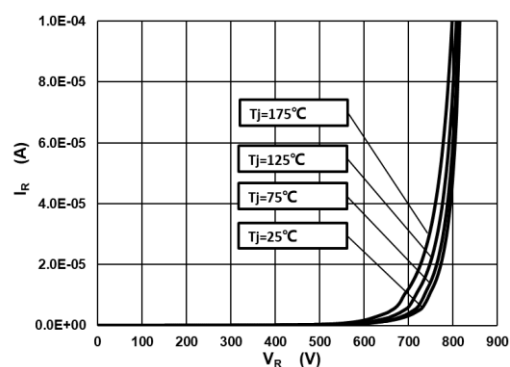


Fig 3: Current Derating

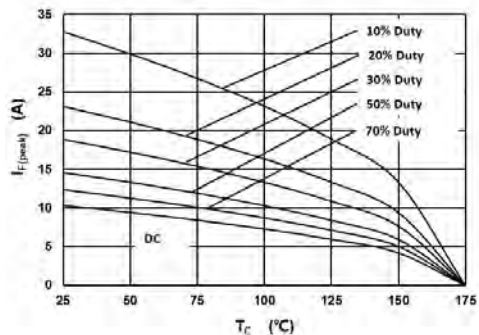


Fig 4: Power Derating

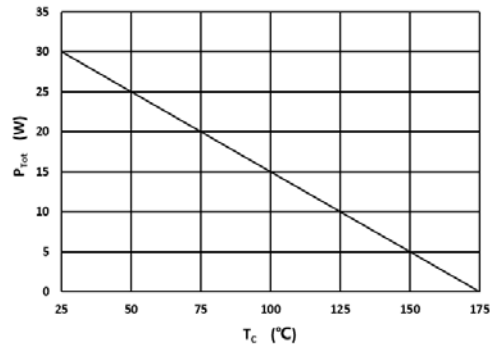




Fig 5: Capacitance vs. Reverse Voltage

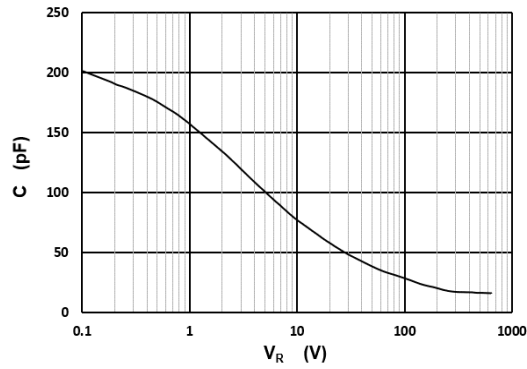


Fig 6: Reverse Charge vs. Reverse Voltage

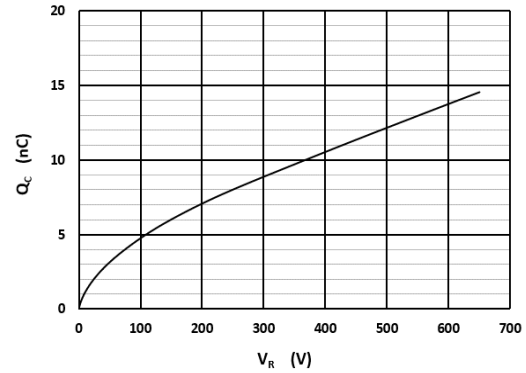


Fig 7: Typical Capacitance Stored Energy

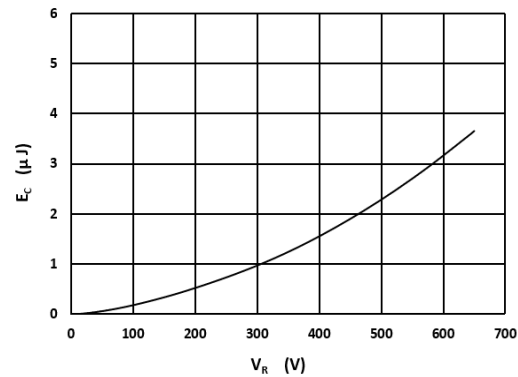
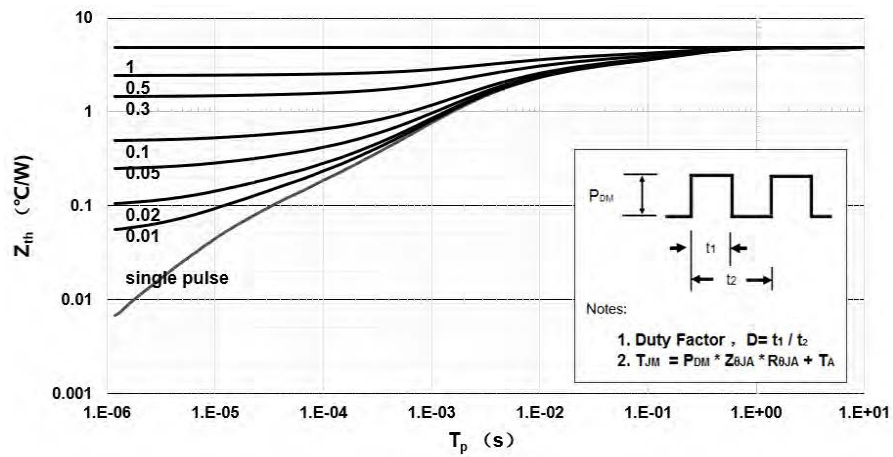


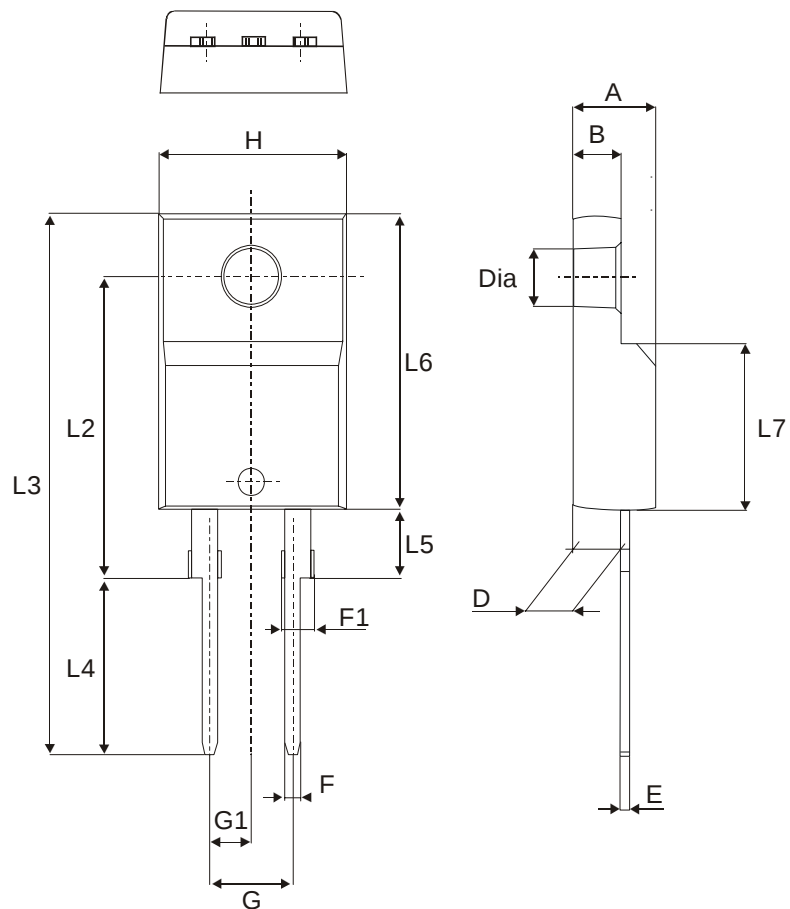
Fig 8: Transient Thermal Impedance





Package Dimensions

Package TO-220F-2L



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	2.50	2.70	0.098	0.106
D	2.50	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1.00	0.030	0.039
F1	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.40	2.70	0.094	0.106
H	10.00	10.40	0.393	0.409
L2	16.00 typ.		0.630 typ.	
L3	28.60	30.60	0.126	1.205
L4	9.80	10.60	0.386	0.417
L5	2.90	3.60	0.114	0.142
L6	15.90	16.40	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126



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