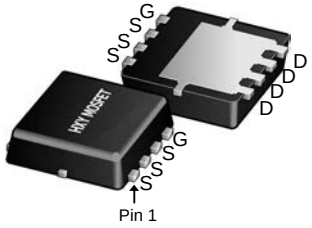
HFTK3903Z

P-Channel Enhancement Mode MOSFET

Description

The HFTK3903Z uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

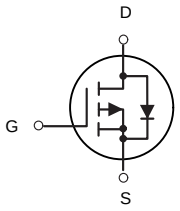


DFN3X3-8L

General Features

V_{DS} =-30V I_D =-55A

$R_{DS(ON)}$ < 11mΩ @ V_{GS}=-10V



P-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
HFTK3903Z	DFN3X3-8L	HXY MOSFET	5000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-30	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	-55	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	-23	A
IDM	Pulsed Drain Current[2]	-140	A
EAS	Single Pulse Avalanche Energy[3]	78.8	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	21.5	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
R_{θ}JC	Thermal Resistance Junction-Case[1]	5.8	℃/W

Electrical Characteristics (T_J=25℃unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D= -250μA	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -30V, V_{GS} = 0V,	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V, V_{GS} = ±20V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D= -250μA	-1.0	-1.5	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS} =-10V, I_D =-12A	-	8.5	11	mΩ
		V_{GS} =-4.5V, I_D =-8A	-	13	18	
C_{iss}	Input Capacitance	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz	-	2800	-	pF
C_{oss}	Output Capacitance		-	346	-	pF
C_{rss}	Reverse Transfer Capacitance		-	319	-	pF
Q_g	Total Gate Charge	V_{DS}= -15V, I_D = -20A, V_{GS} = -10V	-	30	-	nC
Q_{gs}	Gate-Source Charge		-	5.3	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	7.6	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = -15V, I_D = -20A, V_{GS}=-10V, R_{GEN}=2.5Ω	-	14	-	ns
t_r	Turn-on Rise Time		-	20	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	95	-	ns
t_f	Turn-off Fall Time		-	65	-	ns
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-55	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-140	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -35A	-	-0.8	-1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J= 25℃, VDD= -20V, VG= -10V, L= 0.5mH, RG= 25Ω, IAS= -17A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

Figure1: Output Characteristics

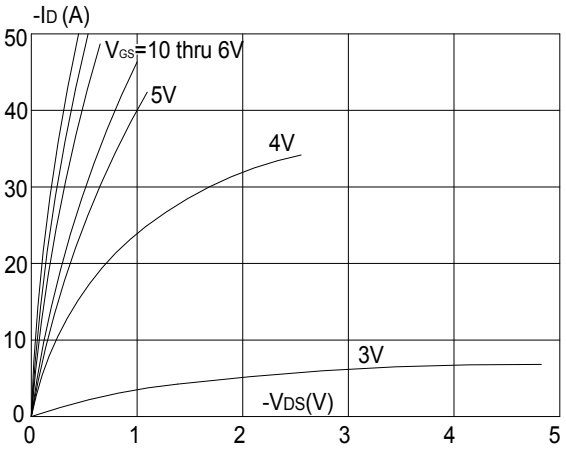


Figure 2: Typical Transfer Characteristics

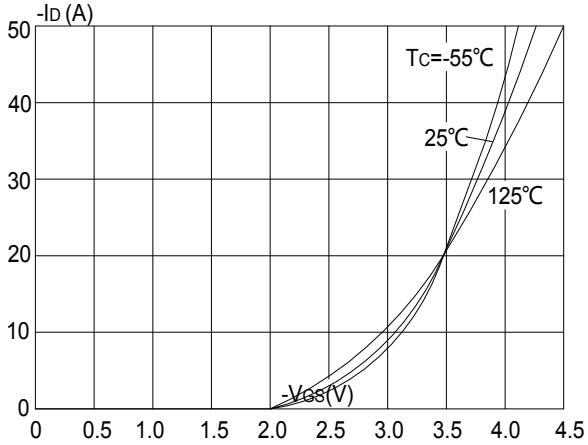


Figure 3: On-resistance vs. Drain Current

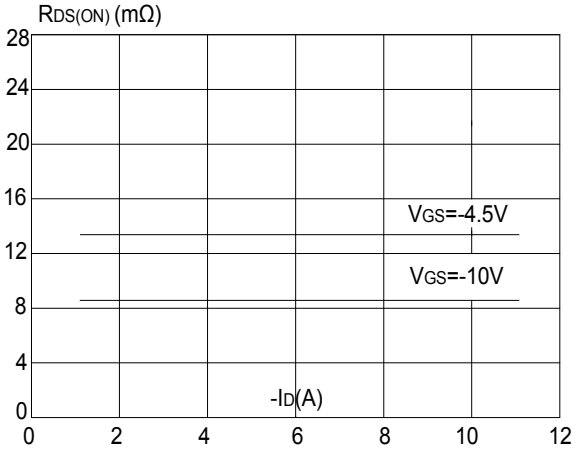


Figure 4: Body Diode Characteristics

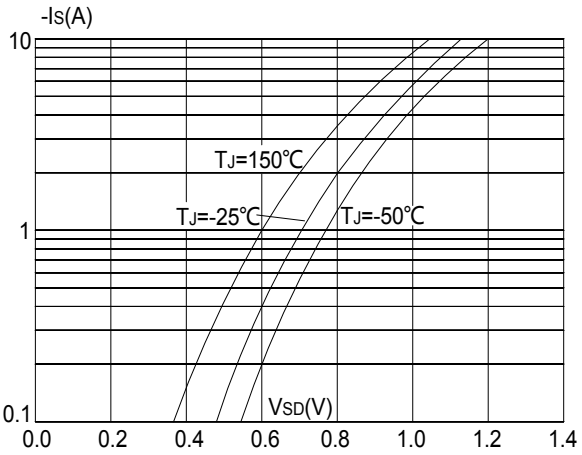


Figure 5: Gate Charge Characteristics

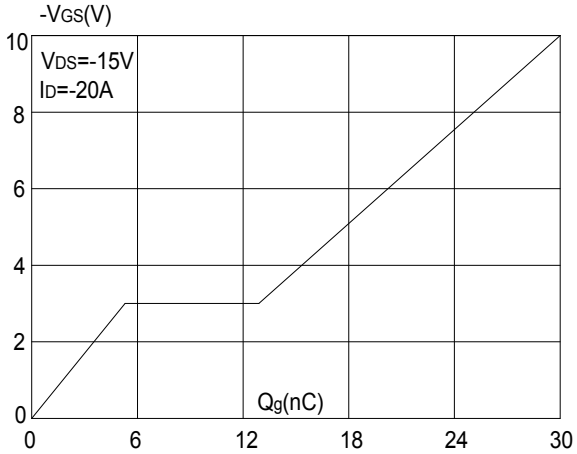


Figure 6: Capacitance Characteristics

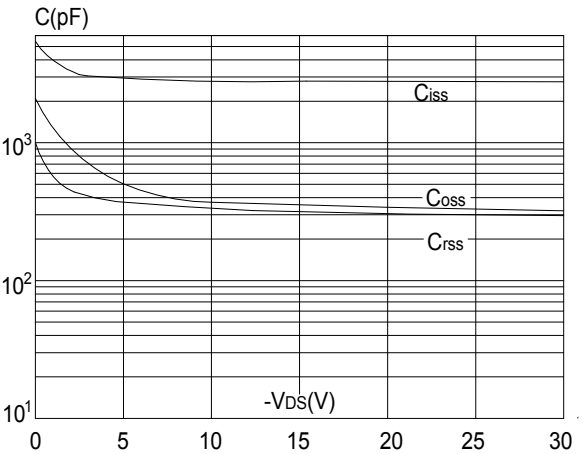


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

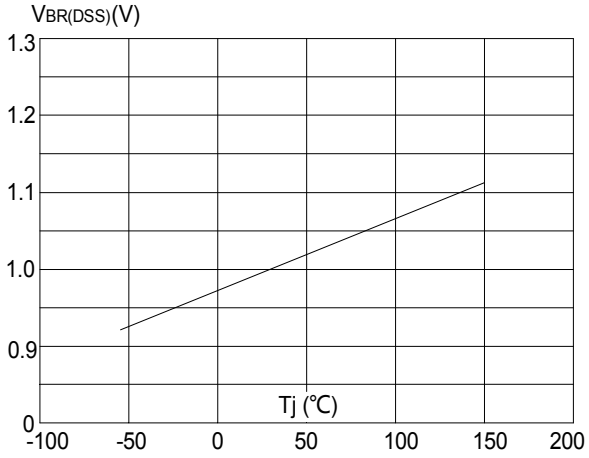


Figure 8: Normalized on Resistance vs. Junction Temperature

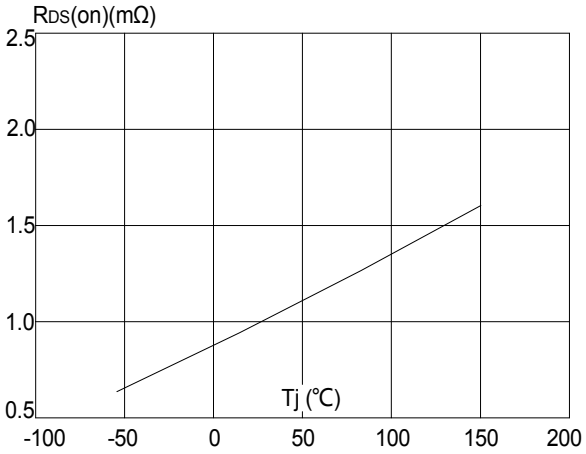


Figure 9: Maximum Safe Operating Area

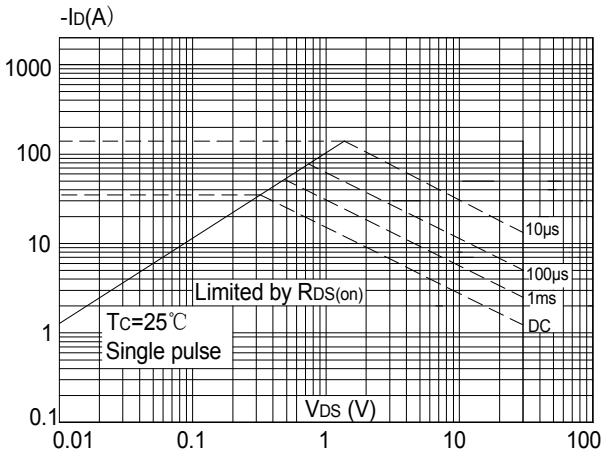


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

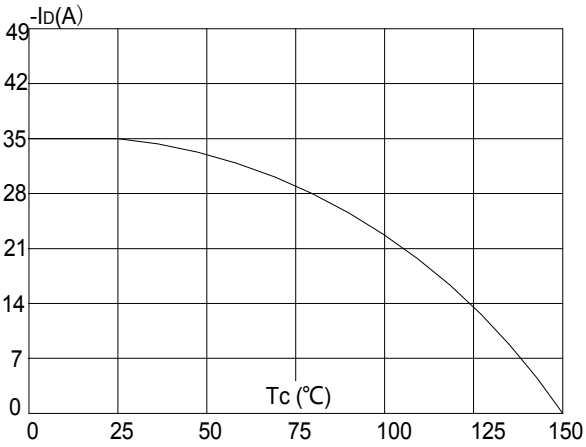
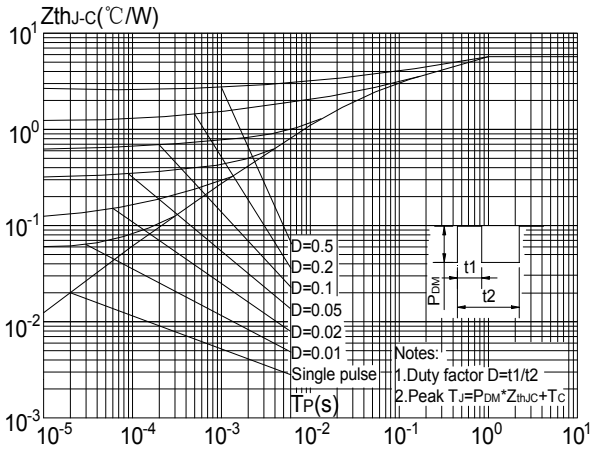
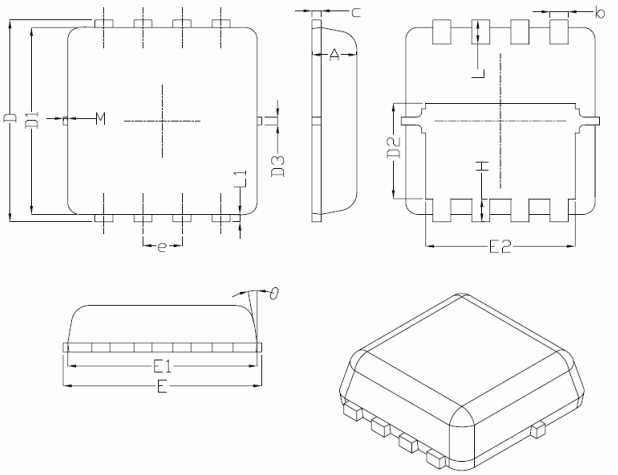


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



DFN3X3-8L Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°

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