P-Channel Enhancement Mode MOSFET

1. Product Information

Features

- Advanced Trench Technology
- Lead free product is acquired
- Low Gate Charge
- Excellent Cdv/dt effect decline

Applications

- PWM applications
- Load switch
- Power management

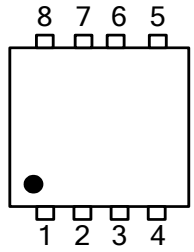
Quick reference

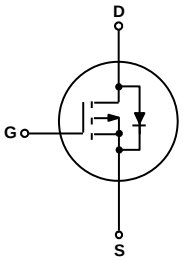
- $B_V \geqq$ -30V
- $I_D \leqq$ -60A
- $R_{DS(ON)} \leqq$ 7.5mΩ @ V_{GS} = -10V（Type: 5.8mΩ）
- $R_{DS(ON)} \leqq$ 12mΩ @ V_{GS} = -4.5V（Type: 9.0mΩ）

Pin Description

Pin	Description
1,2,3	Gate(G)
4	Source(S)
5,6,7,8	Drain(D)

Simplified Outline	Symbol





Top View
PDFN3.3×3.3-8L

Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape width	Quantity
KJ90P03Q	PDFN3.3×3.3-8L	90P03 YWWXXX YWWXXX: Date Code	13 inch	-	5000

2. Absolute Maximum Ratings (TC=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_a =25℃)	I_D	-60	A
Continuous Drain Current (T_a =100℃)	I_D	-42	A
Pulsed Drain Currenr (1)	I_{DM}	-320	A
Singel Pulsed Avalanche Energy (2)	E_{AS}	105	mJ
Power Dissipation	P_D	48	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	2.6	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

3. Electrical Characteristics (TJ=25℃, unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-30V, V_{GS} = 0V	-	-	-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V,V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.0	-1.5	-2.5	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =-10V, I_D =-30A	-	5.8	7.5	mΩ
		V_{GS} =-4.5V, I_D =-20A	-	9	12	
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =-15V, V_{GS} =0V, f =1MHz	-	4320	-	pF
Output Capacitance	C_{oss}		-	534	-	
Reverse Transfer Capacitance	C_{rss}		-	493	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=-15V, I_D=-15A, V_{GS}=-10V, R_G=2.5Ω	-	19	-	ns
Turn-on rise time	t_r		-	15	-	
Turn-off delay time	$t_{d(off)}$		-	65	-	
Turn-off fall time	t_f		-	36	-	
Total Gate Charge	Qg	VDS=-15V, ID=-15A, VGS=-10V	-	45	-	nC
Gate-Source Charge	Qgs		-	8	-	
Gate-Drain Charge	Qgd		-	12	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=-1A	-	-	-1.2	V
Diode Forward current(4)	I_S		-	-	-60	A

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=-15V,R_G=25Ω,L=0.5mH,I_{AS}=-20.5A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

4.Typical Performance Characteristics

Figure1: Output Characteristics

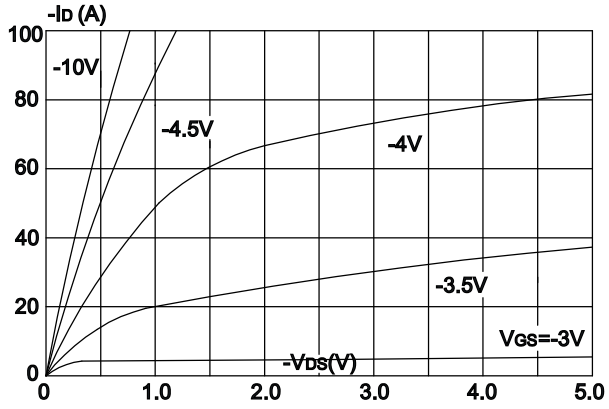


Figure 2: Typical Transfer Characteristics

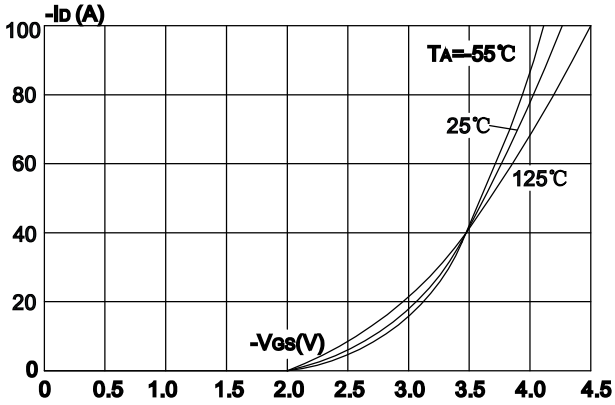


Figure 3: On-resistance vs. Drain Current

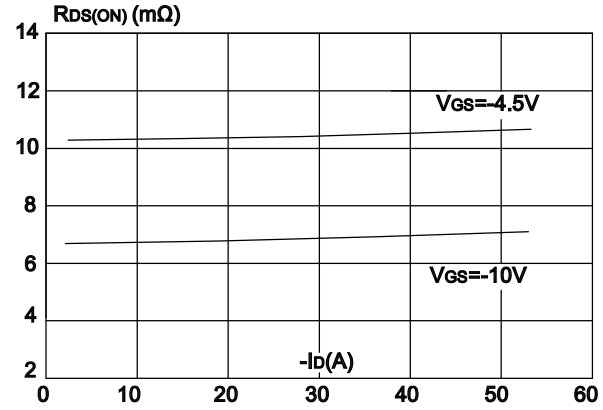


Figure 4: Body Diode Characteristics

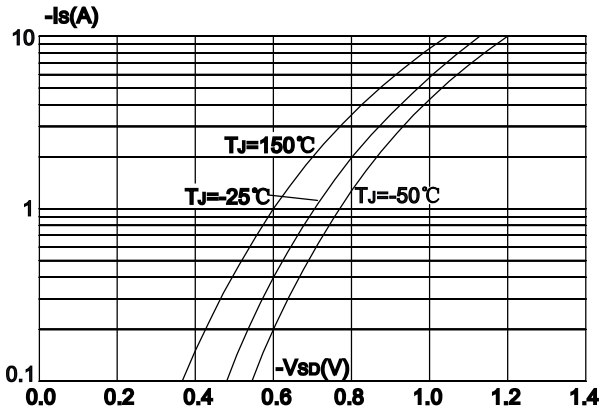


Figure 5: Gate Charge Characteristics

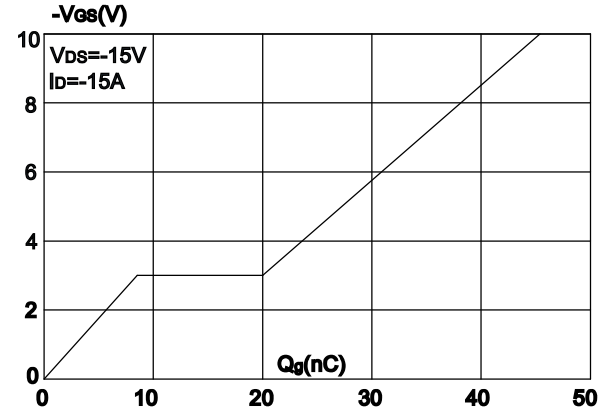


Figure 6: Capacitance Characteristics

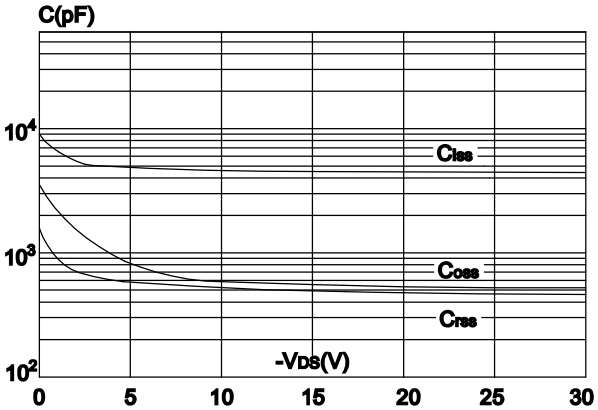


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

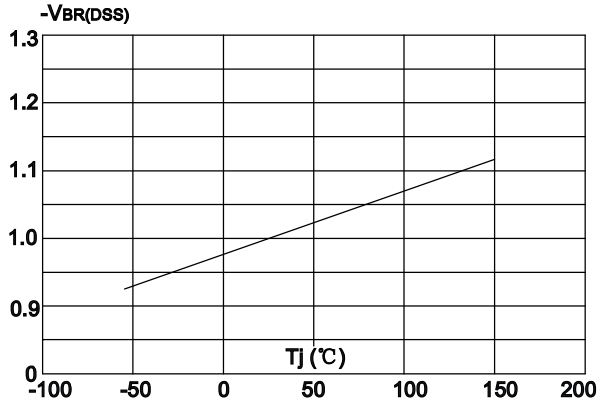


Figure 8: Normalized on Resistance vs. Junction Temperature

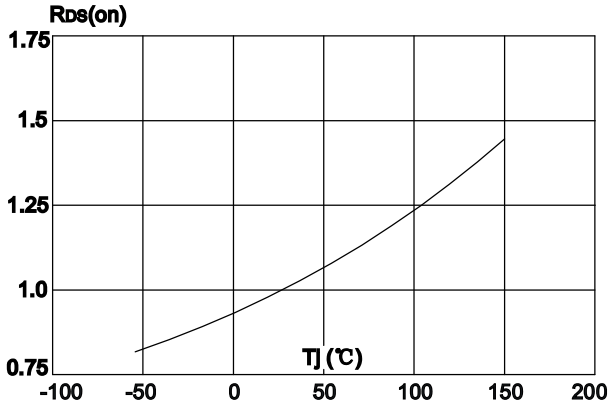


Figure 9: Maximum Safe Operating Area

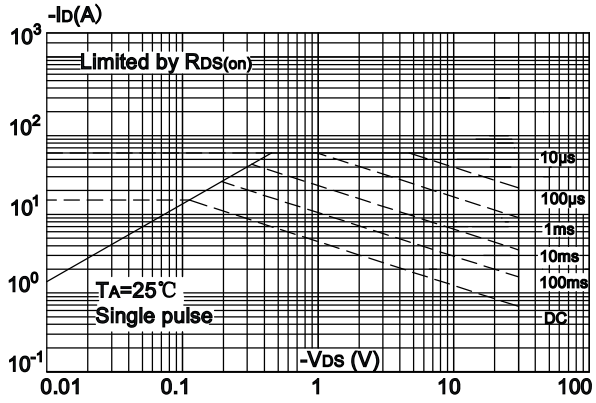


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

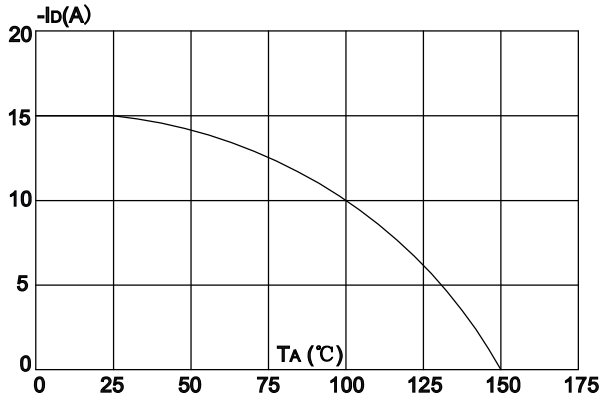
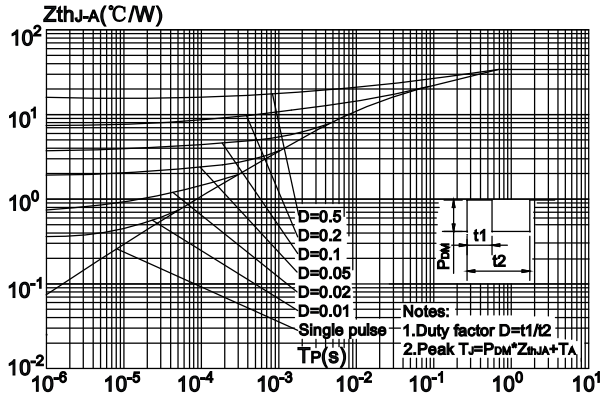
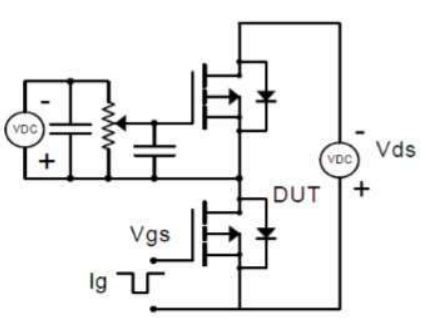


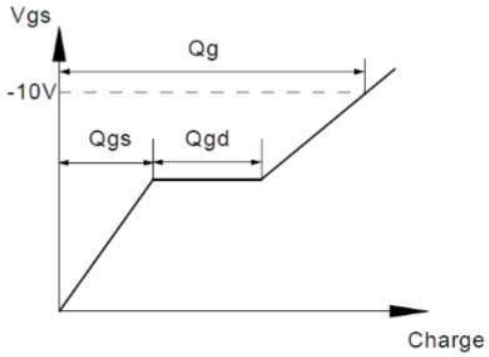
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



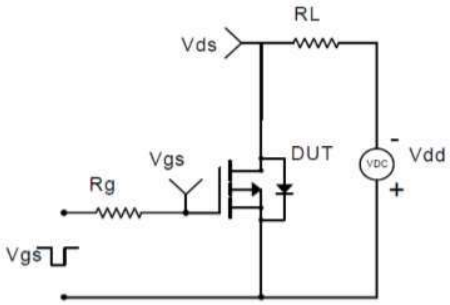
Test Circuit

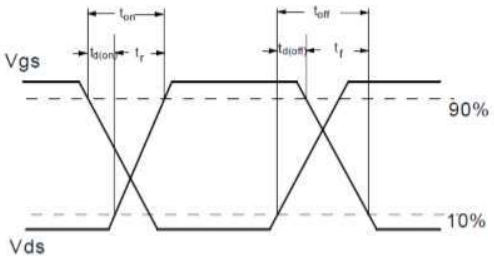
Gate Charge Test Circuit & Waveform



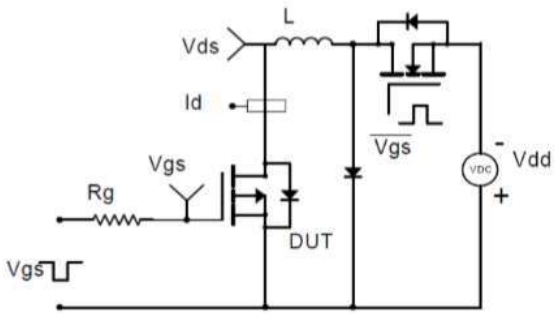


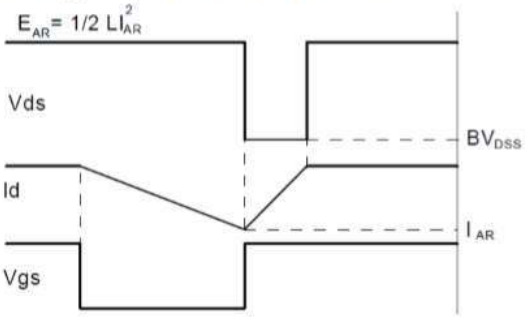
Resistive Switching Test Circuit & Waveforms



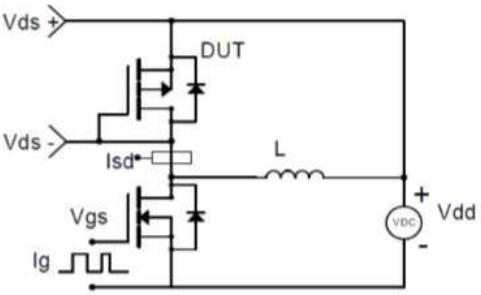


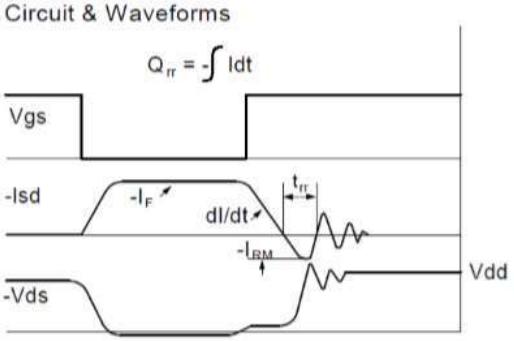
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





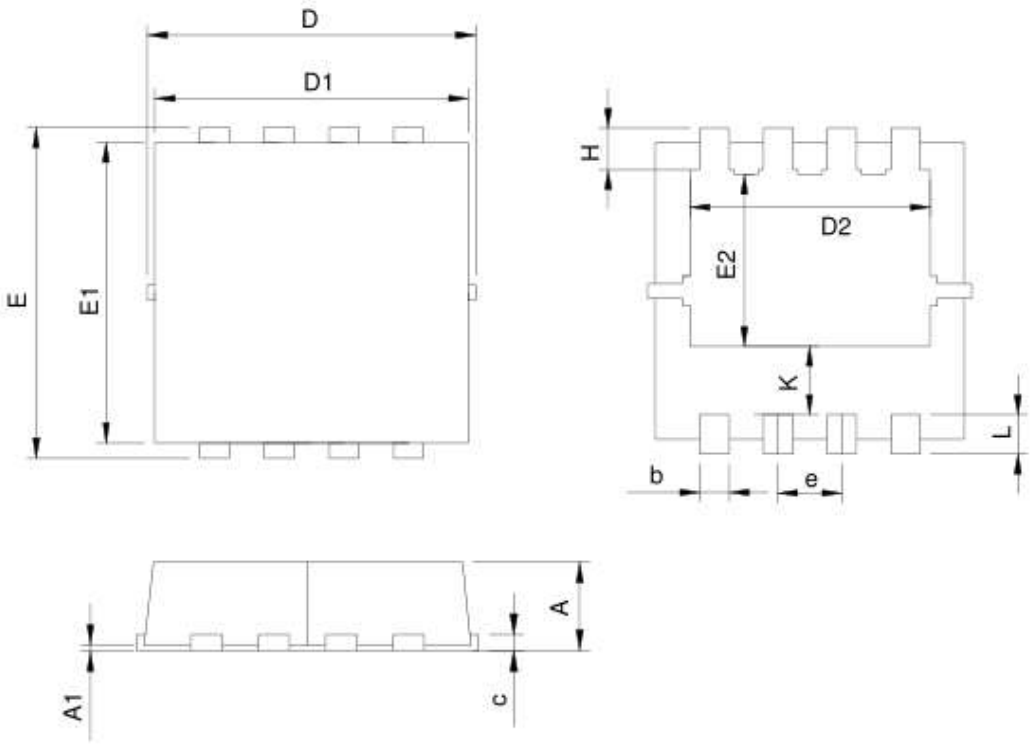
Diode Recovery Test Circuit & Waveforms





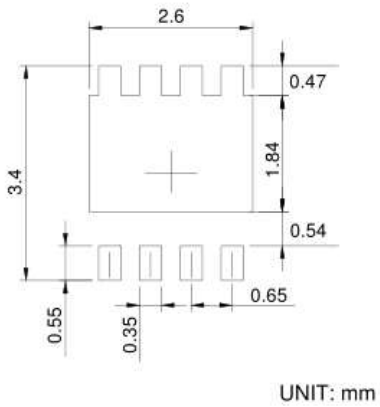
5.Package Mechanical Data

PDFN3.3×3.3-8L



SYMBOL	DFN3.3x3.3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

RECOMMENDED LAND PATTERN



UNIT: mm