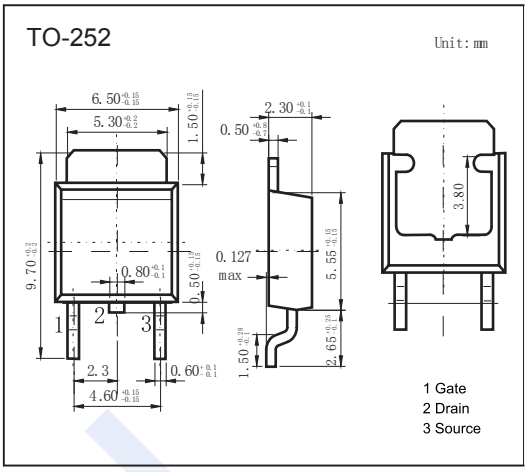
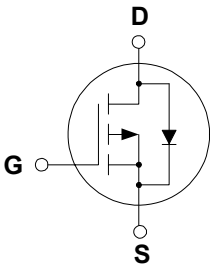
P-Channel MOSFET

FQD12P10 (KQD12P10)



■ Features

- V_{DS} (V) =-100V
- I_D =-9.4 A (V_{GS} =-10V)
- $R_{DS(ON)}$ < 290mΩ (V_{GS} =-10V)
- Low gate charge
- Low Crss
- Fast switching



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	-100	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current	Tc = 25°C	I_D	-9.4	A
	Tc = 100°C		-6	
Pulsed Drain Current		I_{DM}	-37.6	
Avalanche Current		I_{AR}	-9.4	
Single Pulsed Avalanche Energy (Note.1)		E_{AS}	370	mJ
Repetitive Avalanche Energy		E_{AR}	5	
Peak Diode Recovery dv/dt (Note.2)		dv/dt	-6	V/ns
Power Dissipation	Ta = 25°C	P_D	2.5	W
	Tc = 25°C		50	
Power Dissipation - Derate above 25°C			0.4	W/℃
Thermal Resistance.Junction- to-Ambient	(Note.3)	R_{thJA}	50	℃/W
			110	
Thermal Resistance, Junction-to-Case		R_{thJC}	2.5	
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300	℃
Junction Temperature		T_J	150	
Junction Storage Temperature Range		T_{stg}	-55 to 150	

Note.1: L = 6.3mH, I_{AS} = -9.4A, V_{DD} = -25V, R_G = 25 Ω, Starting T_J = 25°C

Note.2: I_{SD} ≤ -11.5A, di/dt ≤ 300A/μs, V_{DD} ≤ BV_{DSS}, Starting TJ = 25°C

Note.3: When mounted on the minimum pad size recommended (PCB Mount)

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-250μA, V_{GS}=0V	-100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-100V, V_{GS}=0V			-1	uA
		V_{DS}=-80V, V_{GS}=0V, T_c=125℃			-10	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=-250μA	-2		-4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-10V, I_D=-4.7A			290	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-40V, I_D=-4.7A (Note.1)		6.3		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-25V, f=1MHz (Note.1)			800	pF
Output Capacitance	C_{oss}				290	
Reverse Transfer Capacitance	C_{rss}				85	
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-80V, I_D=-11.5A (Note.1)		21	27	nC
Gate Source Charge	Q_{gs}			4.6		
Gate Drain Charge	Q_{gd}			11.5		
Turn-On DelayTime	$t_{d(on)}$	V_{DD} = -50 V, I_D = -11.5 A, R_G = 25 Ω (Note.1)			40	ns
Turn-On Rise Time	t_r				330	
Turn-Off DelayTime	$t_{d(off)}$				80	
Turn-Off Fall Time	t_f				130	
Body Diode Reverse Recovery Time	t_{rr}	V_{GS} = 0 V, I_S = -11.5 A, dIF / dt = 100 A/μs (Note.1)		110		
Body Diode Reverse Recovery Charge	Q_{rr}			470		nC
Maximum Body-Diode Continuous Current	I_S				-9.4	A
Pulsed Drain-Source Diode Forward Current	I_{SM}				-37.6	
Diode Forward Voltage	V_{SD}	I_S=-9.4A,V_{GS}=0V			-4	V

Note.1: Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

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■ Typical Characterisitics

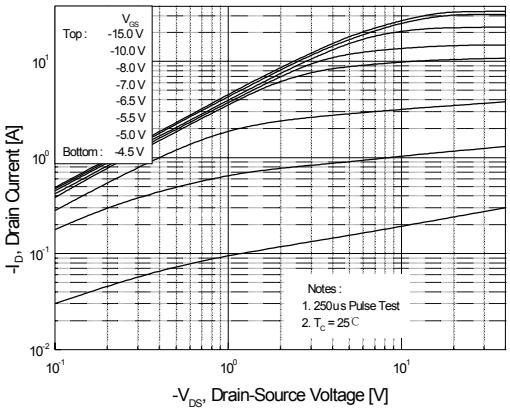

Figure 1. On-Region Characteristics

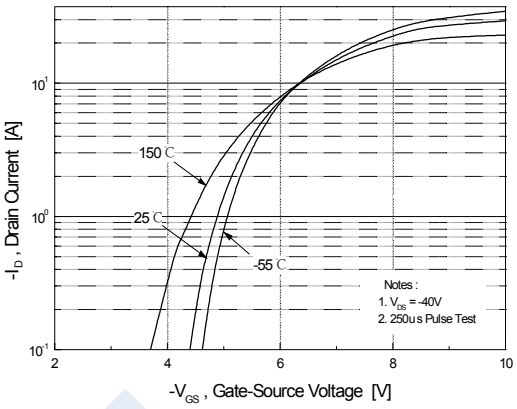

Figure 2. Transfer Characteristics

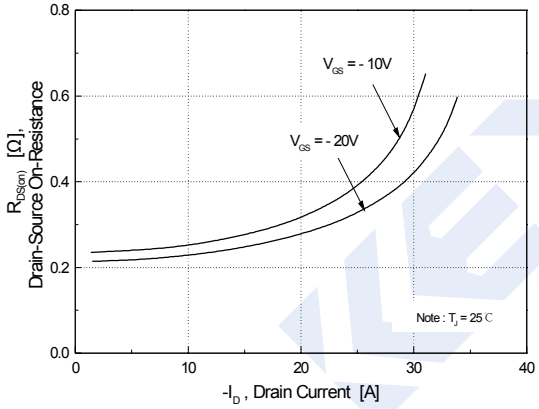

Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

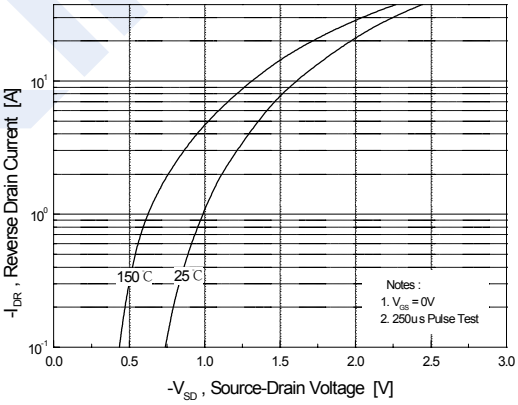

Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

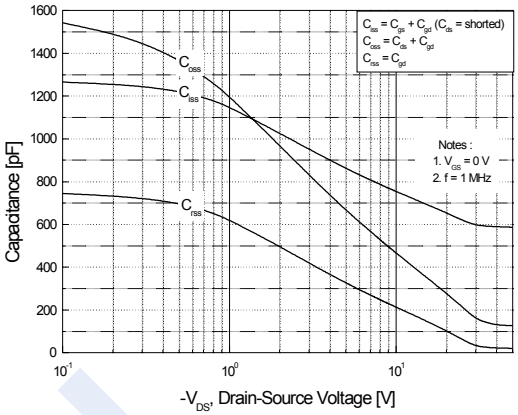

Figure 5. Capacitance Characteristics

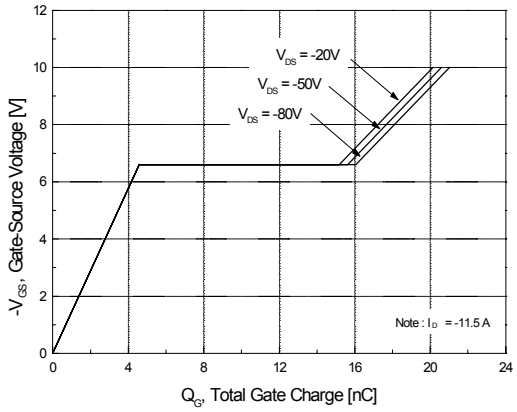

Figure 6. Gate Charge Characteristics

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■ Typical Characterisitics

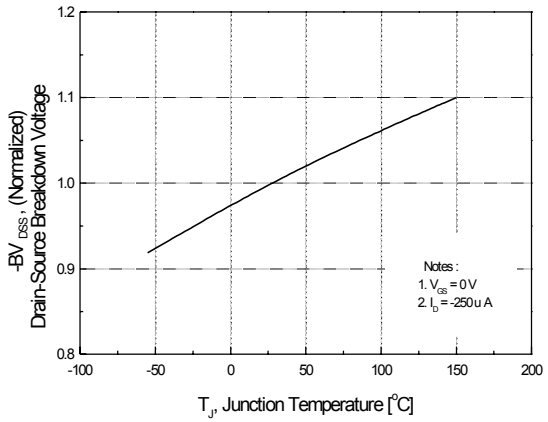

Figure 7. Breakdown Voltage Variation vs. Temperature

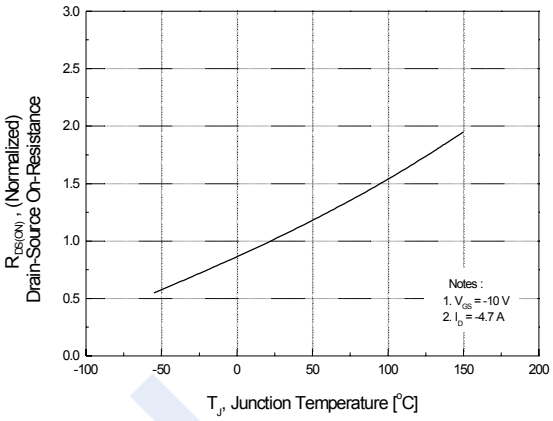

Figure 8. On-Resistance Variation vs. Temperature

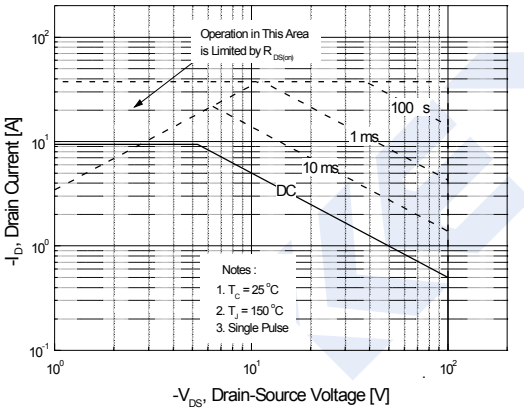

Figure 9. Maximum Safe Operating Area

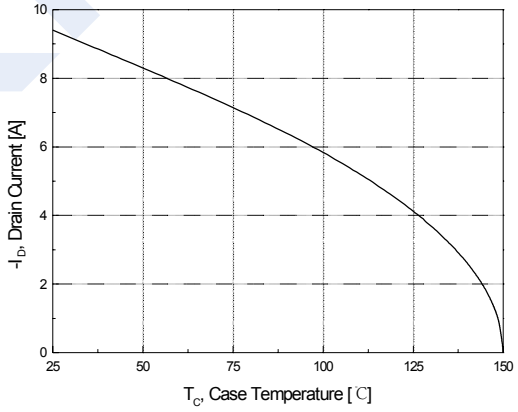

Figure 10. Maximum Drain Current vs. Case Temperature

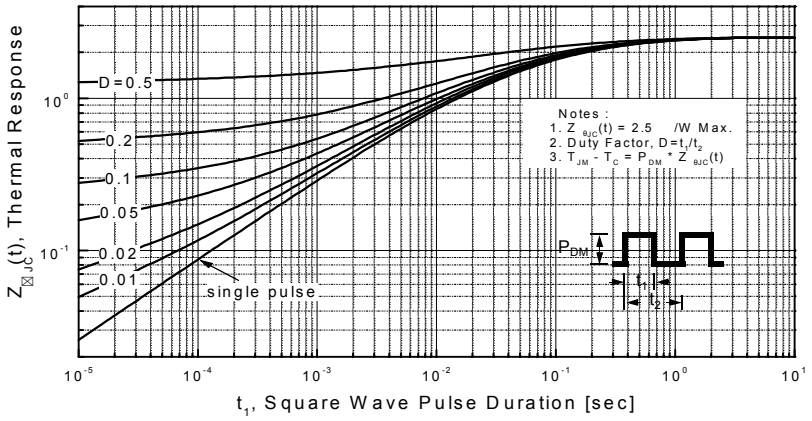

Figure 11. Transient Thermal Response Curve