

PRODUCT CHARACTERISTICS

VDSS	500V
$R_{DS(on)typ}(V_{GS}=10V)$	2.4Ω
Qg@type	18nC
ID	5A

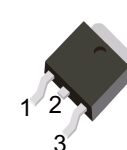
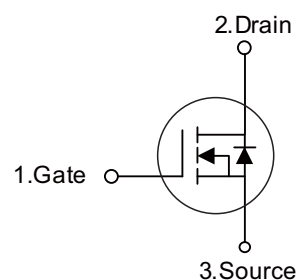
APPLICATIONS

- High frequency switching mode power supply
- Electronic ballast
- LED power supply

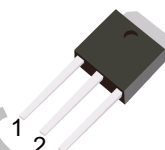
FEATURES

- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness

Symbol



TO-252



TO-251

ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	FQD3N50XD	TO-252	2500 pieces /Reel
N/A	FQU3N50XC	TO-251	70 pieces/Tube

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	500	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	Continuous	I_D	5	A
	Pulsed (Note 2)	I_{DM}	10	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	151	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	V/ns
Power Dissipation		P_D	50	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55~+150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating: Pulse width limited by maximum junction temperature.

3. $L = 10\text{mH}$, $I_{AS} = 5.5\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$ Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 5.0\text{A}$, $di/dt \leq 100\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

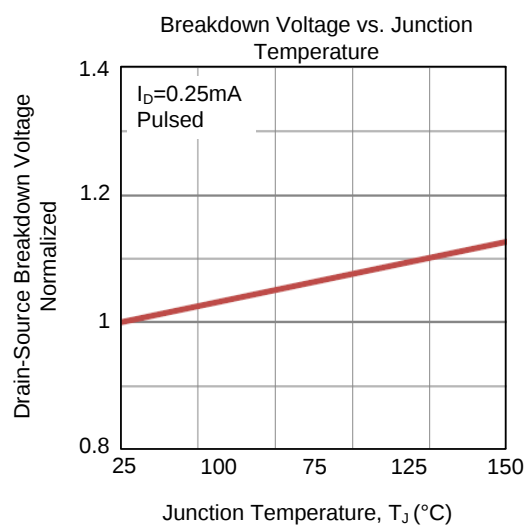
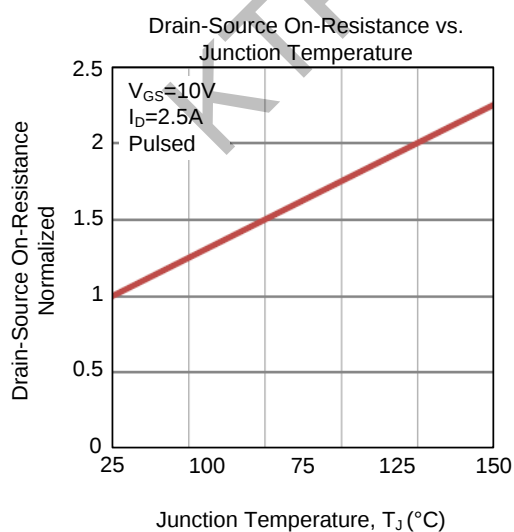
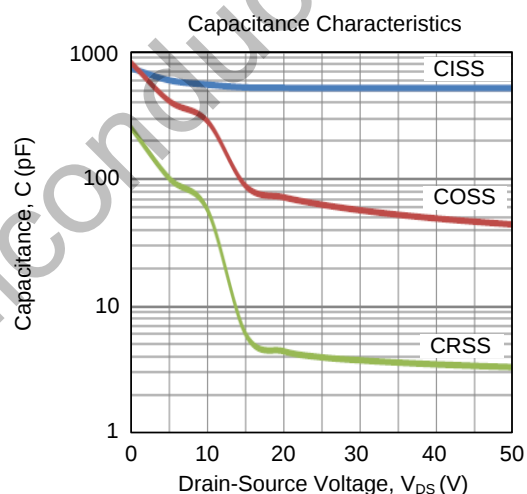
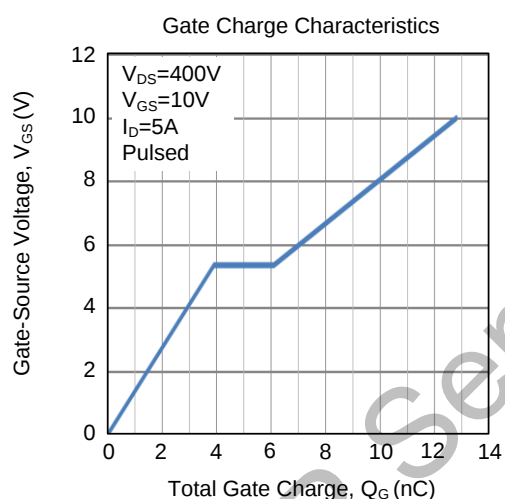
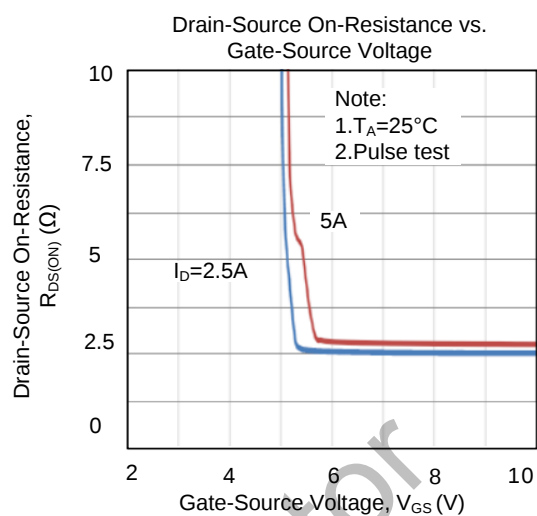
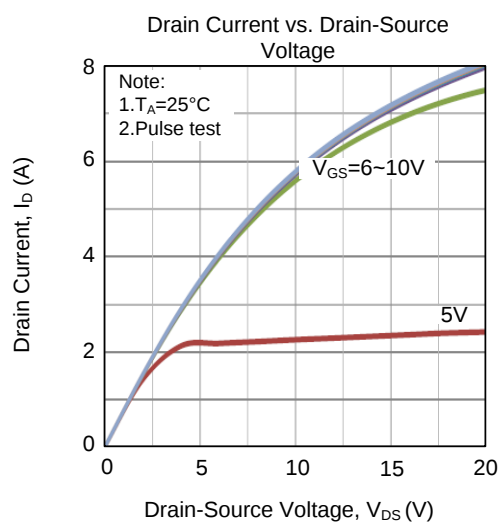
■ ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	500	-	-	V
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =250μA	-	0.5	-	V/°C
Drain-Source Leakage Current		I _{DSS}	V _{DS} =500V, V _{GS} =0V	-	-	1	μA
			V _{DS} =400V, T _C =125°C	-	-	10	
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =30V, V _{DS} =0V	-	-	100	nA
	Reverse		V _{GS} =-30V, V _{DS} =0V	-	-	-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0	-	4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =2.5A	-	2.4	3.0	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz	-	625	-	pF
Output Capacitance		C _{OSS}		-	80	-	pF
Reverse Transfer Capacitance		C _{RSS}		-	15	-	pF
SWITCHING CHARACTERISTICS							
Total Gate Charge		Q _G	V _{GS} =10V, V _{DS} =400V, I _D =5A (Note 1, 2)	-	18	-	nC
Gate to Source Charge		Q _{GS}		-	2.2	-	nC
Gate to Drain Charge		Q _{GD}		-	9.7	-	nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =250V, I _D =5A, R _G =25Ω (Note 1, 2)	-	12	-	ns
Rise Time		t _R		-	46	-	ns
Turn-OFF Delay Time		t _{D(OFF)}		-	50	-	ns
Fall-Time		t _F		-	48	-	ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S		-	-	5	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}		-	-	20	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =5A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time		t _{rr}	I _S =5A, V _{GS} =0V,	-	83	-	ns
Reverse Recovery Charge		Q _{RR}	dl _F /dt=100A/μs (Note 1)	-	0.25	-	uC

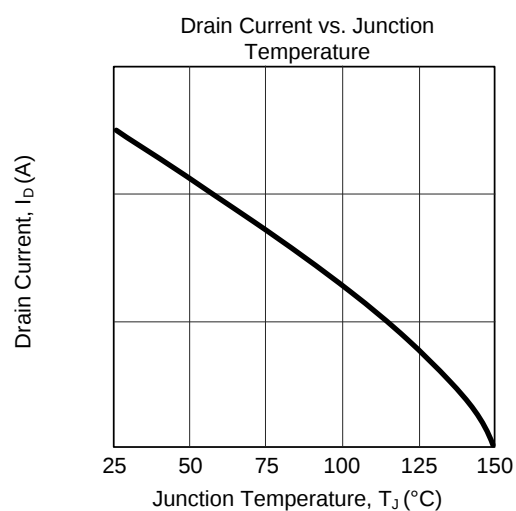
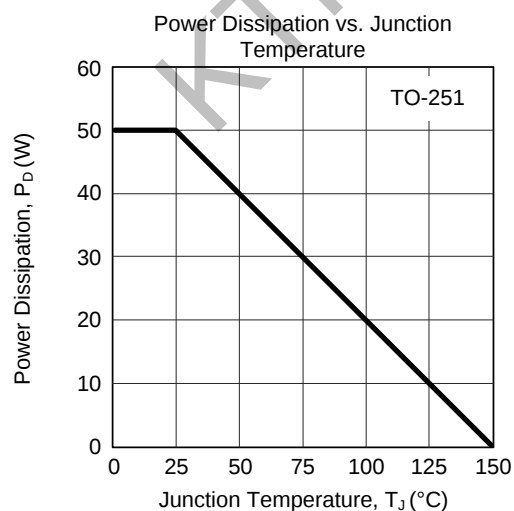
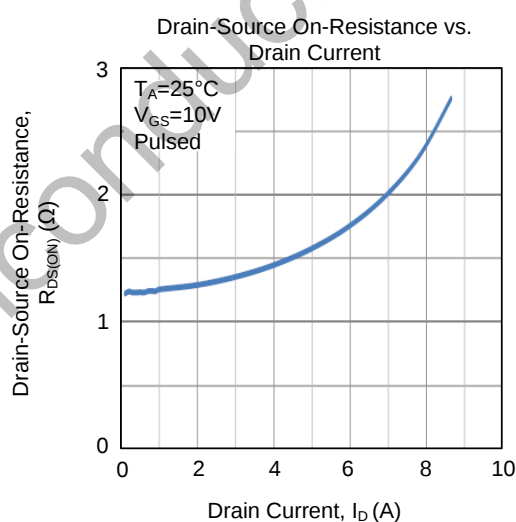
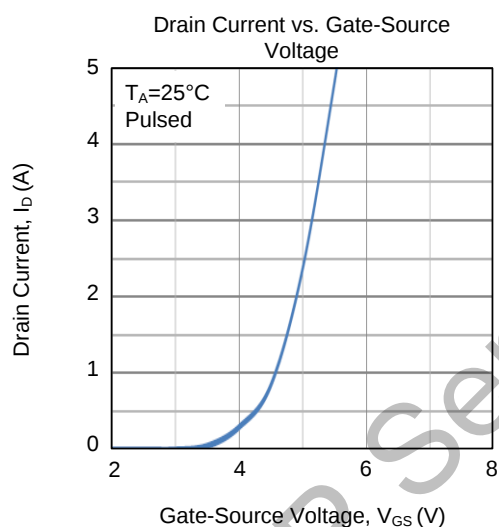
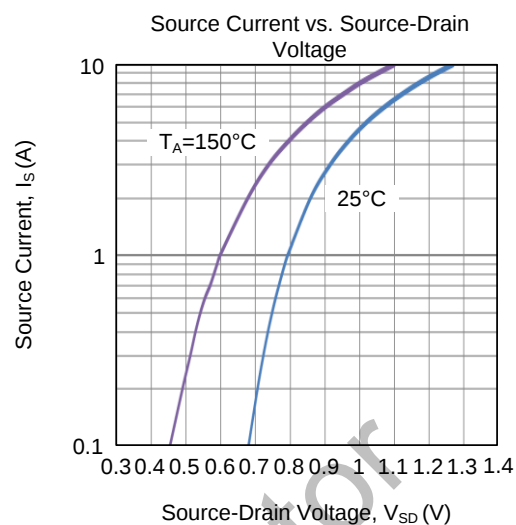
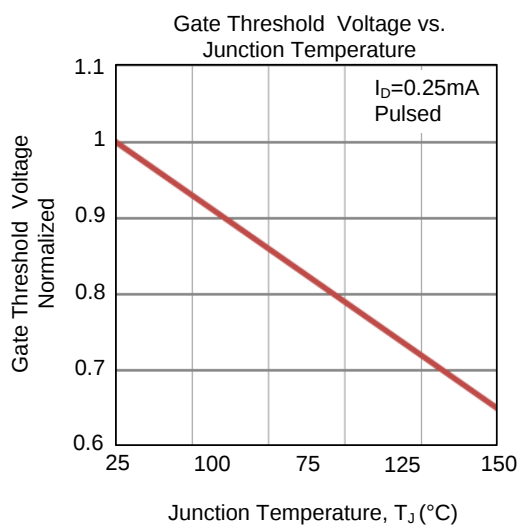
Note: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

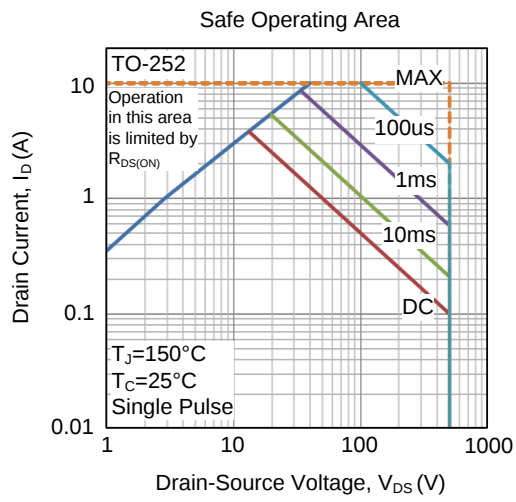
■ TYPICAL CHARACTERISTICS



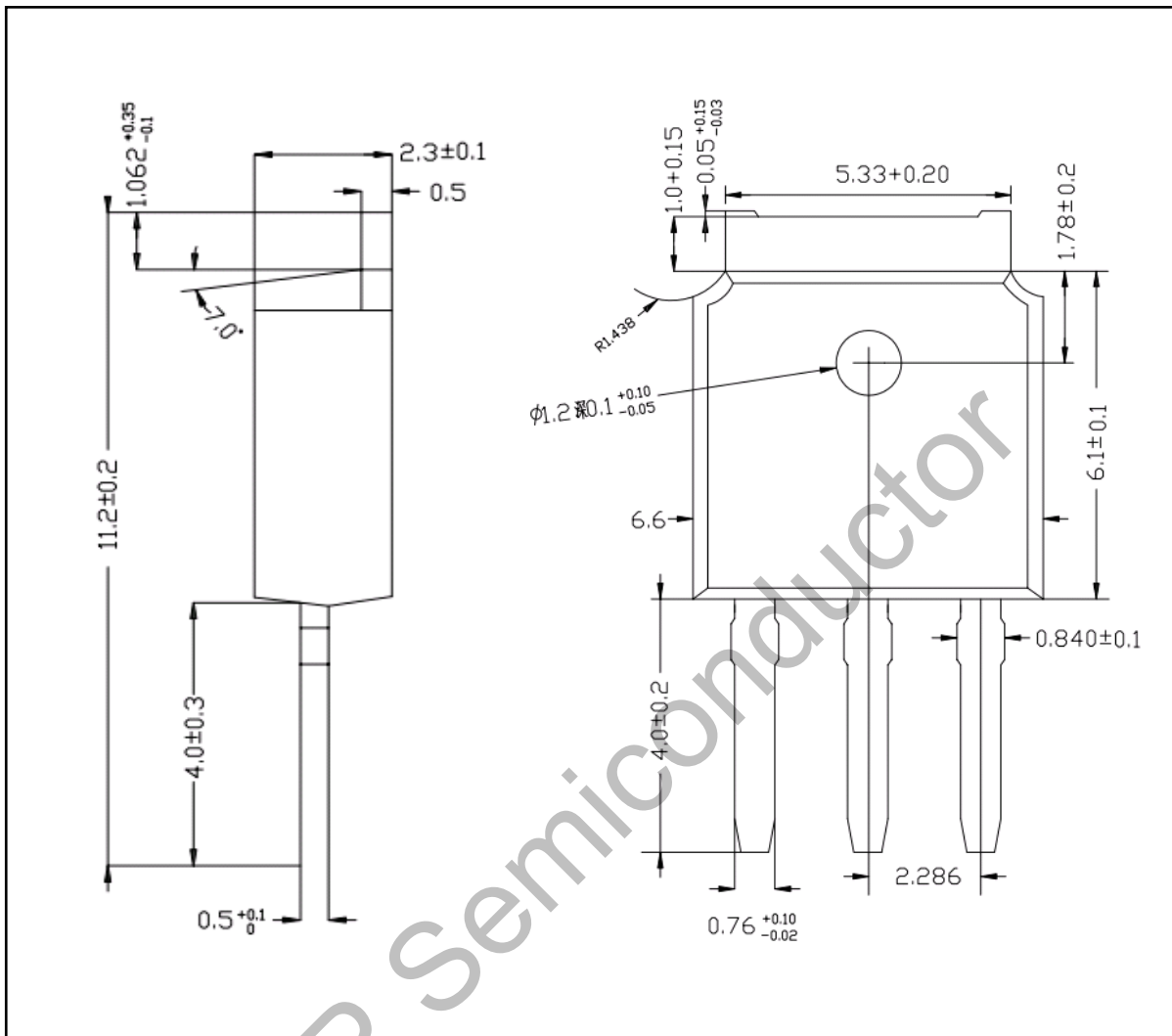
■ TYPICAL CHARACTERISTICS(Cont.)



■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-251-3L PACKAGE OUTLINE DIMENSIONS



■ TO-252 PACKAGE OUTLINE DIMENSIONS

