

MOSFET

**6A, 400V, 1.0 OHM,
N-CHANNEL POWER MOSFET**

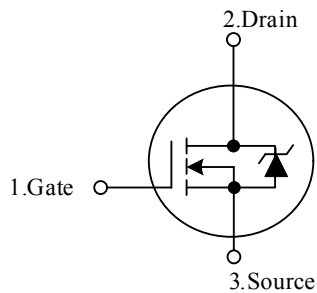
■ **DESCRIPTION**

The FTK730 power MOSFET is designed for high voltage, high speed power switching applications such as switching power supplies, switching adaptors.

■ **FEATURES**

- * 6A, 400V, Low $R_{DS(ON)}$ (1.0 Ω)
- * Single Pulse Avalanche Energy Rated
- * Rugged - SOA is Power Dissipation Limited
- * Fast Switching

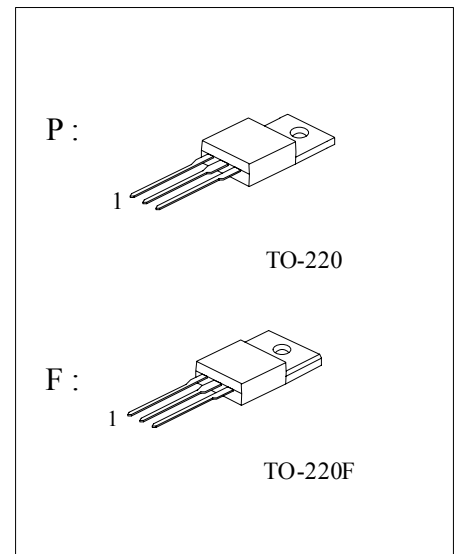
■ **SYMBOL**



■ **ORDERING INFORMATION**

Order Number	Package	Pin Assignment			Packing
		1	2	3	
FTK730P	TO-220	G	D	S	Tube
FTK730F	TO-220F	G	D	S	Tube

Note: Pin Assignment: G: Gate D: Drain S: Source





■ ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

PARAMET		SYMBOL	RATINGS	UNIT
Drain-Source Voltage (T _J = 25°C ~ 125°C)		V _{DS}	400	V
Drain to Gate Voltage (R _{GS} = 20kΩ) (T _J = 25°C ~ 125°C)		V _{DGR}	400	V
Gate to Source Voltage		I _{GS}	±30	V
Drain Current	Continuous	I _D	6.0	A
	T _C = 100°C	I _D	3.6	A
	Pulsed	I _{DM}	24	A
Maximum Power Dissipation Derating above 25°C		P _D	93	W
			0.6	W/°C
Single Pulse Avalanche Energy Rating (V _{DD} =50V, starting T _J =25°C, L=17mH, R _G =25Ω, peak I _{AS} = 5.5A)		E _{AS}	390	mJ
Operating Temperature Range		T _{OPR}	-55 ~ +150	°C
Storage Temperature Range		T _{STG}	-55 ~ +150	°C

Note: 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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance Junction-Ambient	θ _{JA}	80	°C / W
Thermal Resistance Junction-Case	θ _{Jc}	1.67	

■ ELECTRICAL CHARACTERISTICS (T_C = 25°C, unless Otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = 250μA, V _{GS} = 0V	400			V
Gate to Threshold Voltage	V _{GS(THR)}	V _{DS} = V _{GS} , I _D = 250μA	2.0		4.0	V
On-State Drain Current (Note 1)	I _{D(ON)}	V _{DS} > I _{D(ON)} × R _{DS(ON)MAX} , V _{GS} = 10V	5.5			A
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = Rated BV _{DSS} , V _{GS} = 0V			1	μA
		V _{DS} = 0.8 x Rated BV _{DSS} , V _{GS} = 0V, T _J = 125°C			10	μA
Gate to Source Leakage Current	I _{GSS}	V _{DS} = ±30V			±100	nA
Drain to Source On Resistance (Note 1)	R _{DS(ON)}	I _D = 3.0A, V _{GS} = 10V		0.85	1.0	Ω
Forward Transconductance (Note 1)	g _{FS}	V _{DS} ≥ 10V, I _D = 3.3A	2.9	4.4		S
Turn-On Delay Time	t _{DLY(ON)}	V _{DD} = 200V, I _D ≈ 3.0A, R _{GS} = 25Ω, R _L = 35Ω MOSFET Switching Times are Essentially Independent of Operating Temperature		30	70	ns
Rise Time	t _r			60	130	ns
Turn-Off Delay Time	t _{DLY(OFF)}			100	210	ns
Fall Time	t _f			60	130	ns
Total Gate Charge (Gate to Source + Gate to Drain)	Q _{G(TOT)}	V _{GS} = 10V, I _D = 6A, V _{DS} = 0.8 × Rated BV _{DSS} I _{G(REF)} = 1.5mA Gate Charge is Essentially Independent of Operating Temperature		27	35	nC
Gate to Source Charge	Q _{GS}			6		nC
Gate to Drain "Miller" Charge	Q _{GD}			11		nC
Input Capacitance	C _{ISS}				700	900
Output Capacitance	C _{OSS}	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz		100	130	pF
Reverse - Transfer Capacitance	C _{RSS}			15	20	pF



■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SOURCE TO DRAIN DIODE SPECIFICATIONS						
Source to Drain Diode Voltage (Note 1)	V_{SD}	$T_J = 25^{\circ}\text{C}$, $I_{SD} = 6\text{A}$, $V_{GS} = 0\text{V}$			1.5	V
Continuous Source to Drain Current	I_S				6	A
Pulse Source to Drain Current(Note 2)	I_{SM}				24	A
Reverse Recovery Time	t_{RR}	$T_J = 25^{\circ}\text{C}$, $I_{SD} = 6\text{A}$,		200		ns
Reverse Recovery Charge	Q_{RR}	$di_{SD}/dt = 100\text{ A}/\mu\text{s}$		5.0		μC

Note:

1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$
2. Repetitive rating: Pulse width limited by maximum junction temperature.
3. $V_{DD} = 50\text{V}$, starting $T_J = 25^{\circ}\text{C}$, $L = 17\text{mH}$, $R_G = 25\Omega$, peak $I_{AS} = 6\text{A}$.

■ TEST CIRCUITS AND WAVEFORMS

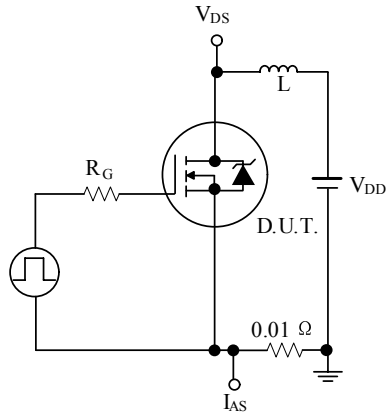


Figure 1A. Unclamped Energy Test Circuit

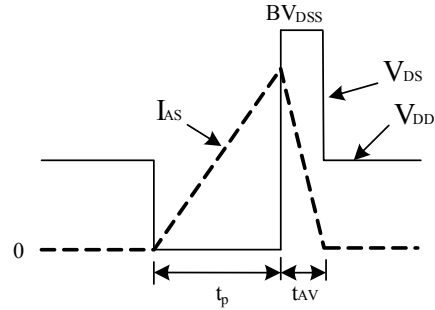


Figure 1B. Unclamped Energy Waveforms

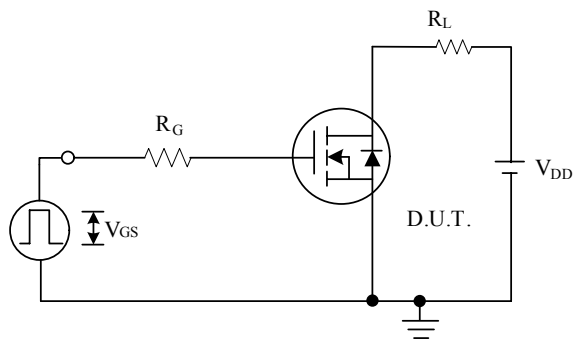


Figure 2A. Switching Time Test Circuit

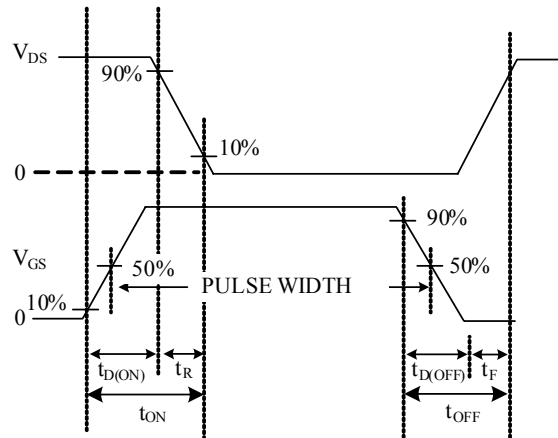


Figure 2B. Resistive Switching Waveforms

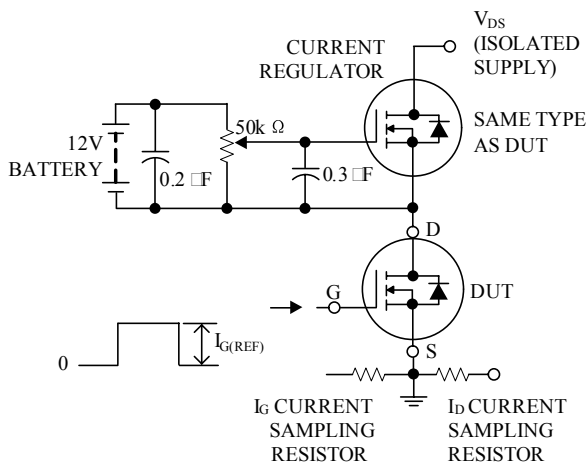


Figure 3A. Gate Charge Test Circuit

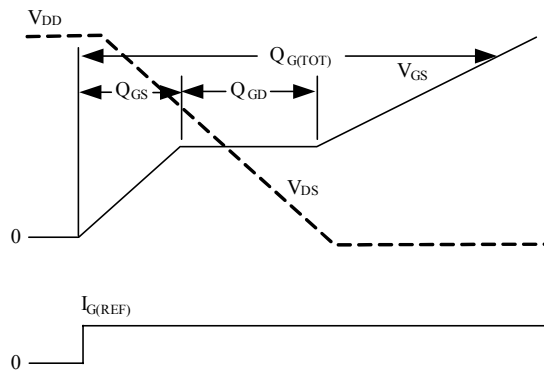
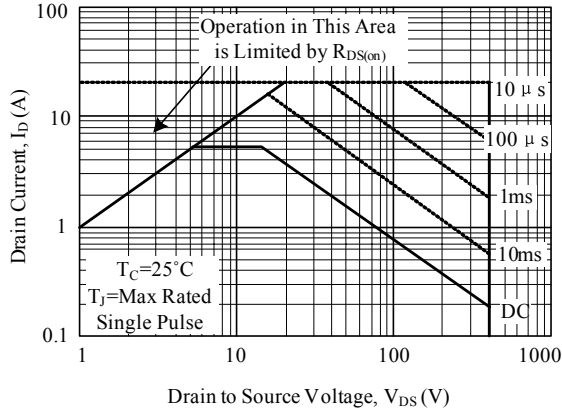


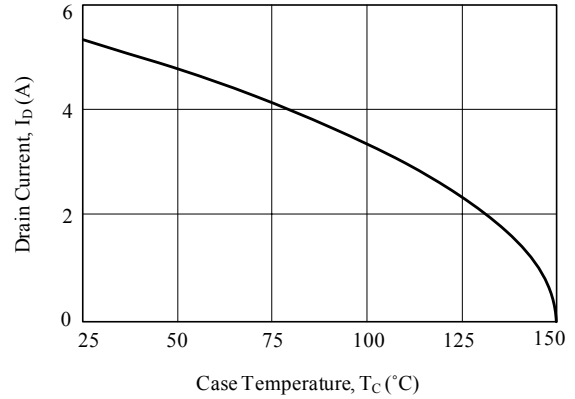
Figure 3B. Gate Charge Waveforms

■ **TYPICAL PERFORMANCE CURVES** (Unless Otherwise Specified)

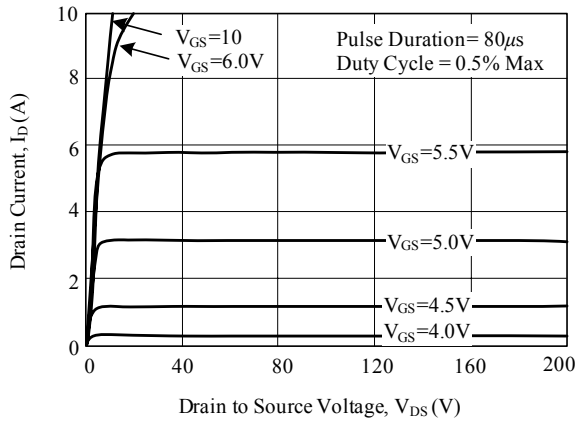
Forward Bias Safe Operating Area



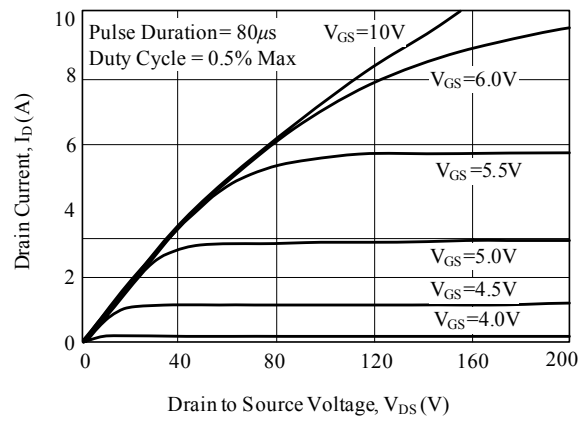
Maximum Continuous Drain Current vs. Case Temperature



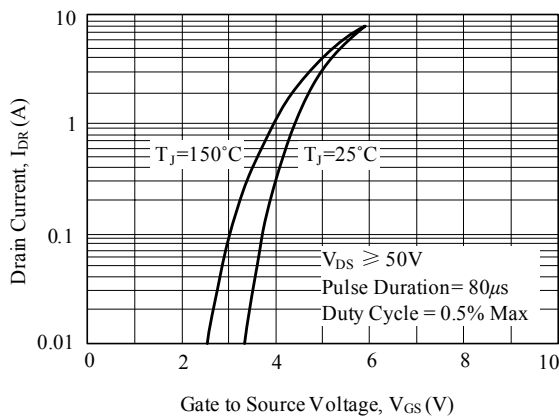
Output Characteristics



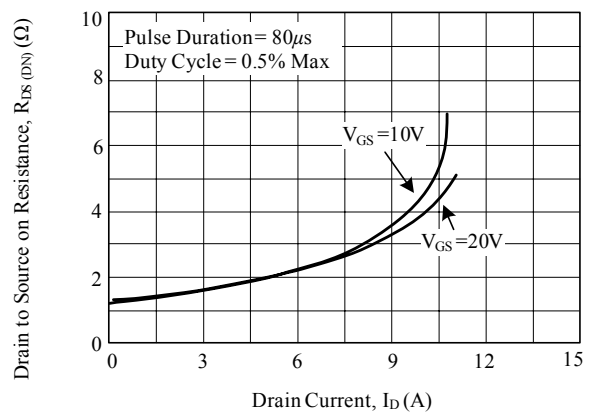
Sturaction Characteristics



Transfer Characteristics

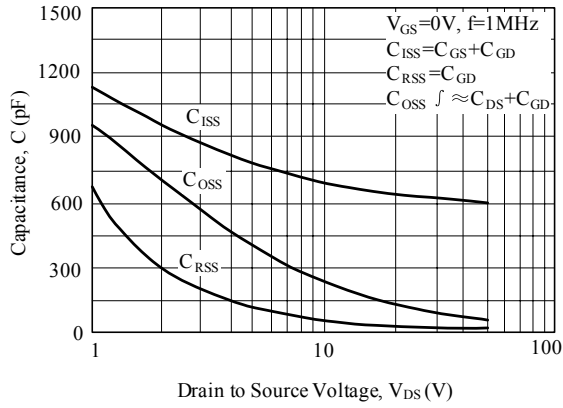


Drain to Source on Resistance vs. Gate Voltage and Drain Current

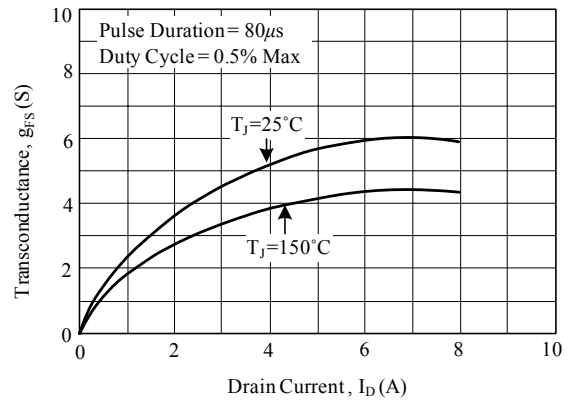


■ TYPICAL PERFORMANCE CURVES

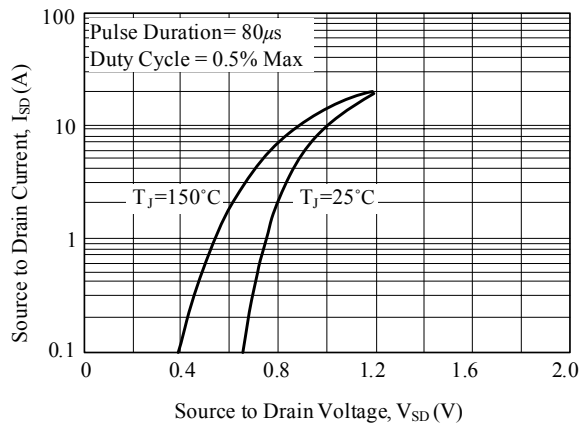
Capacitance vs. Drain to Source Voltage



Transconductance vs. Drain Current



Source to Drain Diode Voltage



Gate to Source Voltage vs. Gate Charge

