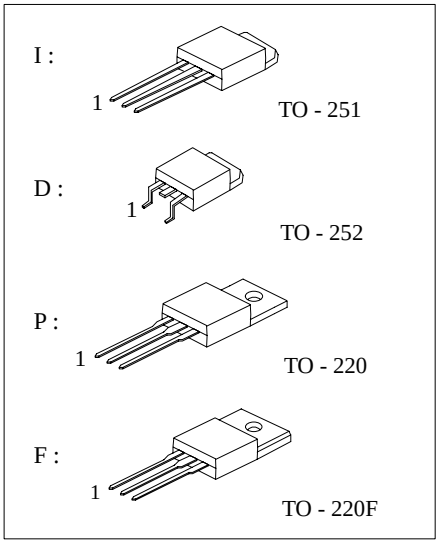
2 Amps, 600 Volts
N-CHANNEL MOSFET



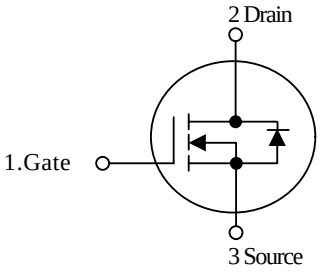
■ DESCRIPTION

The FTK 2N60 is a high voltage MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

■ FEATURES

* $R_{DS(ON)}$ = 3.8Ω@V_{GS} = 10V
* Ultra Low gate charge (typical 1.5nC)
* Low reverse transfer capacitance (C_{RSS} = typical 5.0 pF)
* Fast sw itching capability
* Avalanche energy specified
* Improved dv/dt capability, high ruggedness

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
FTK2N60P	TO-220	G	D	S	Tube
FTK2N60F	TO-220F	G	D	S	Tube
FTK2N60I	TO-251	G	D	S	Tube
FTK2N60D	TO-252	G	D	S	Tape Reel

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

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

PARAMET		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	600	V
Gate-Source Voltage		V_{GSS}	±30	V
Avalanche Current (Note 2)		I_{AR}	2.0	A
Drain Current Continuous	T_C = 25°C	I_D	2.0	A
	T_C = 100°C		1.2	A
Drain Current Pulsed (Note 2)		I_{DP}	8.0	A
Avalanche Energy	Repetitive(Note 2)	E_{AR}	5.4	mJ
	Single Pulse(Note 3)	E_{AS}	131	mJ
Peak Diode Recovery		dv/dt	4.5	V/ns
Total Power Dissipation (TO-251/252/TO-220/TO-220F)	T_C = 25°C	P_D	45/45/62.5/31	W
	Derate above 25°C		0.36/0.36/0.5/0.25	W / ˚C
Junction Temperature		T_J	+150	˚C
Storage Temperature		T_{STG}	-55 ~ +150	˚C

Note: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=64mH, I_{AS}=2.0A, V_{DD}=50V, R_G=25 Ω, Starting T_J = 25°C
4. I_{SD}≤ 2.0A, di/dt ≤ 300A/μs, V_{DD}≤ BVDSS, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	PACKAGE	SYMBOL	RATINGS	UNIT
Thermal Resistance Junction-Ambient	TO-251	θ_{JA}	112	˚C / W
	TO-252		112	
	TO-220		54	
	TO-220F		54	
Thermal Resistance Junction-Case	TO-251	θ_{Jc}	2.8	
	TO-252		2.8	
	TO-220		2	
	TO-220F		4	

■ ELECTRICAL CHARACTERISTICS (T_J = 25˚C , unless Otherwise specified.)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS} = 0V, I_D = 250μA	600			V
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS} = 600V, V_{GS} = 0V			10	μA
			V_{DS} = 480V, T_C = 125°C			10	μA
Gate-Body Leakage Current	Forward	I_{GSS}	V_{GS} = 30V, V_{DS} = 0V			100	nA
	Reverse		V_{GS} = -30V, V_{DS} = 0V			-100	nA
Breakdown Voltage Temperature Coefficient		$\triangle BV_{DSS}/\triangle T_J$	I_D = 250 μA		0.7		V / ˚C
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0		4.0	V
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS} = 10V, I_D =1A		3.8	5	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C_{ISS}	V_{DS} =25V, V_{GS} =0V, f =1MHz		350		pF
Output Capacitance		C_{OSS}			40		pF
Reverse Transfer Capacitance		C_{RSS}			5		pF

■ ELECTRICAL CHARACTERISTICS (T_J = 25˚C , unless Otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} =300V, I_D =2.0A, R_G=25Ω (Note 1,2)		10		ns
Rise Time	t_R			30		ns
Turn-Off Delay Time	$t_{D(OFF)}$			30		ns
Fall Time	t_F			30		ns
Total Gate Charge	Q_G	V_{DS}=480V, V_{GS}=10V, I_D=2.0A (Note 1, 2)		10		nC
Gate-Source Charge	Q_{GS}			1.5		nC
Gate-Drain Charge	Q_{GD}			5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_{SD} = 2.0 A			1.5	V
Continuous Drain-Source Current	I_{SD}				2.0	A
Pulsed Drain-Source Current	I_{SM}				8.0	A
Reverse Recovery Timee	t_{RR}	V_{GS} = 0 V, I_{SD} = 2.0A, di/dt = 100 A/μs (Note1)		250		ns
Reverse Recovery Charge	Q_{RR}			1.0		μC

Note: 1. Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%

2. Essentially Independent of Operating Temperature

■ TEST CIRCUITS AND WAVEFORMS

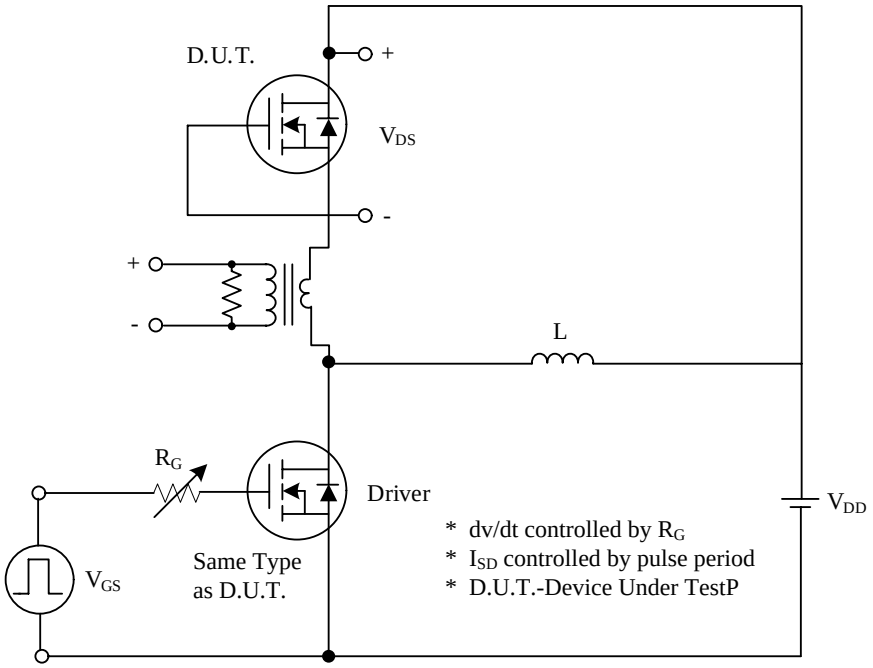


Fig. 1A Peak Diode Recovery dv/dt Test Circuit

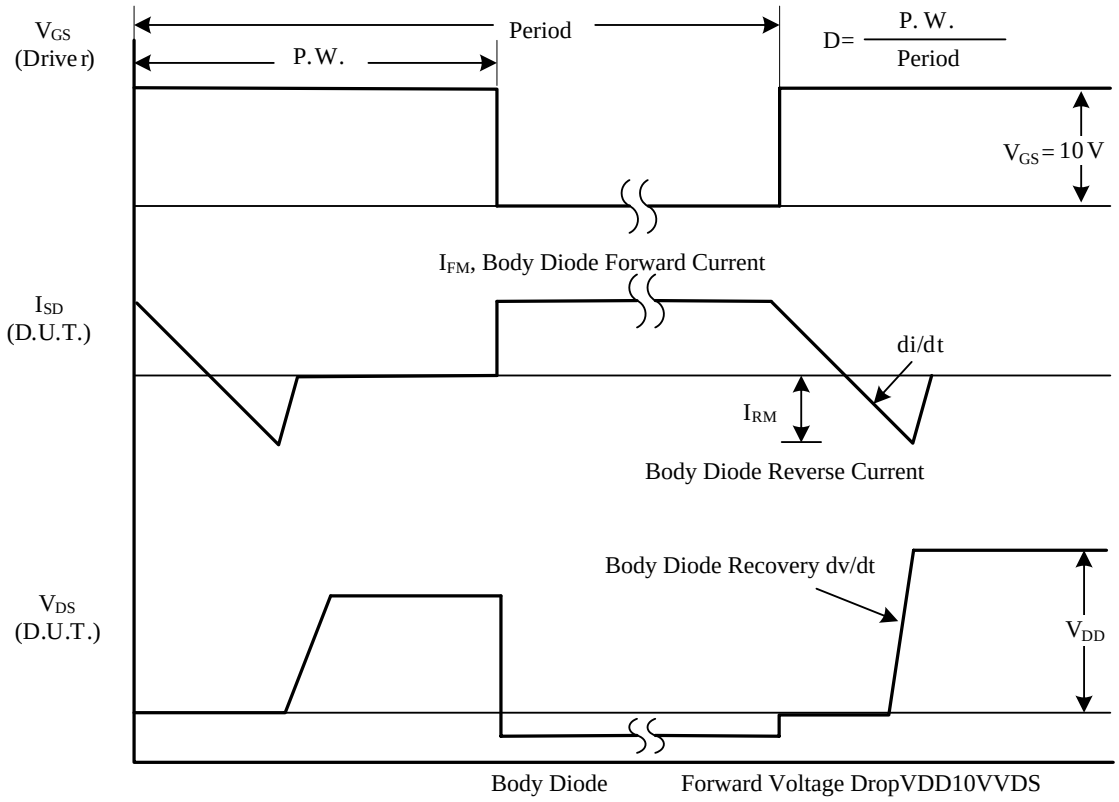


Fig. 1B Peak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS (Cont.)

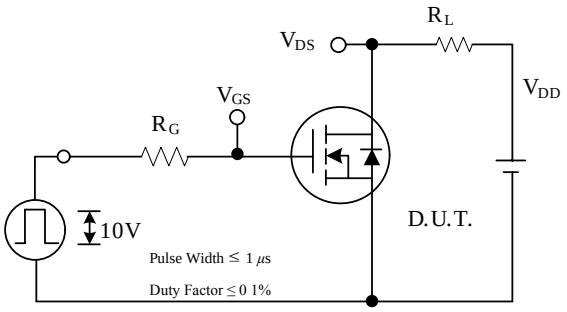


Fig. 2A Switching Test Circuit

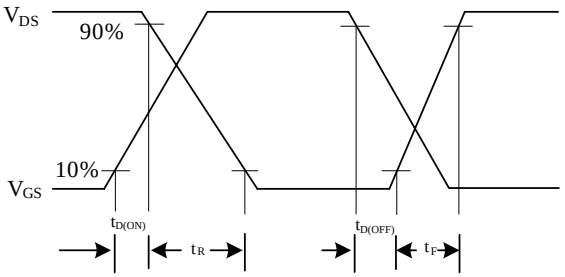


Fig. 2B Switching Waveforms

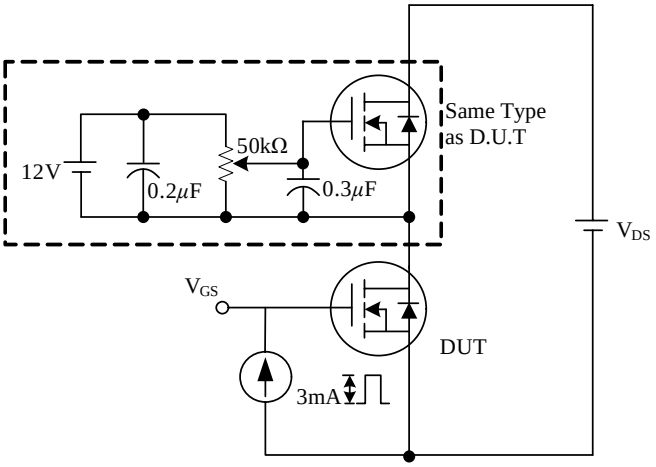


Fig. 3A Gate Charge Test Circuit

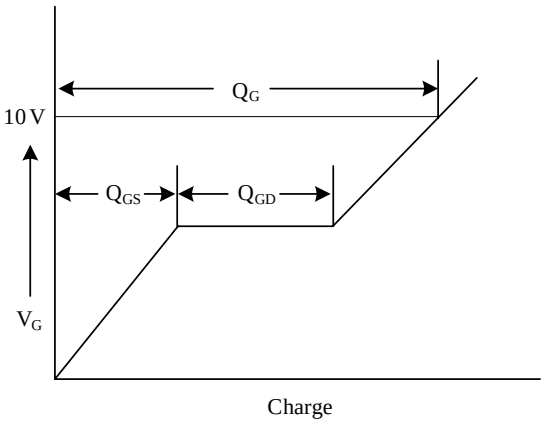


Fig. 3B Gate Charge Waveform

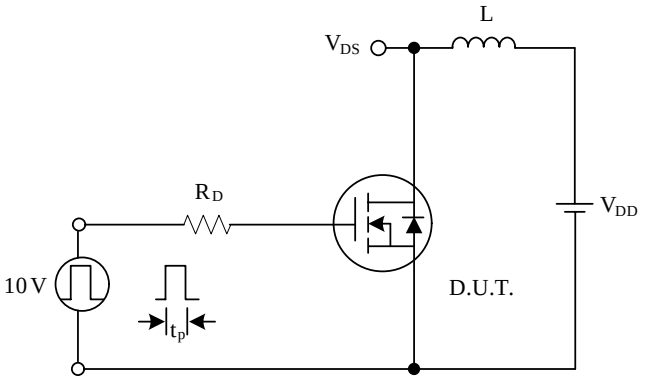


Fig. 4A Unclamped Inductive Switching Test Circuit

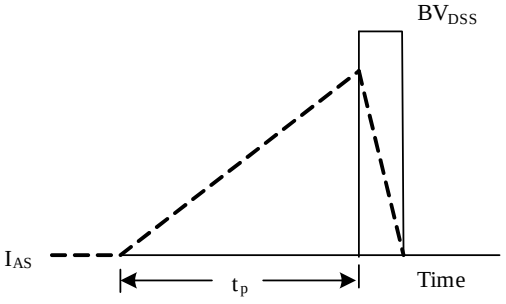
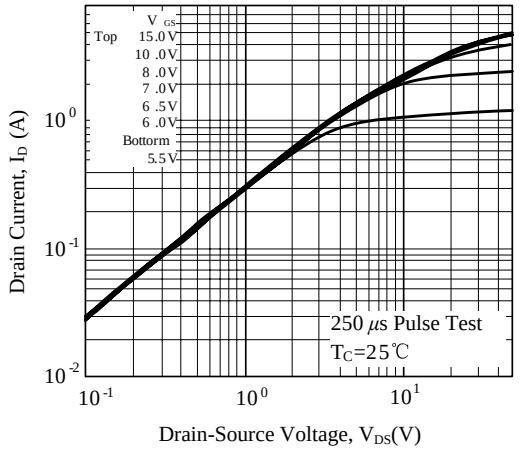


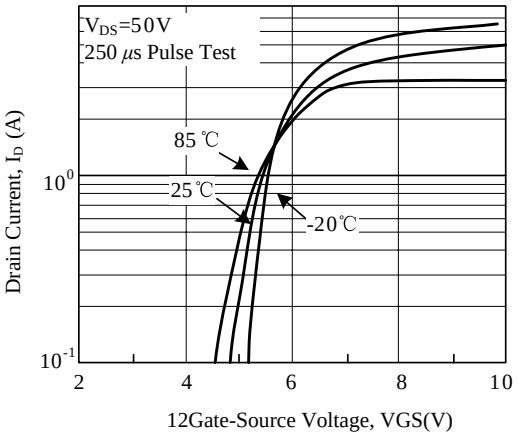
Fig. 4B Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

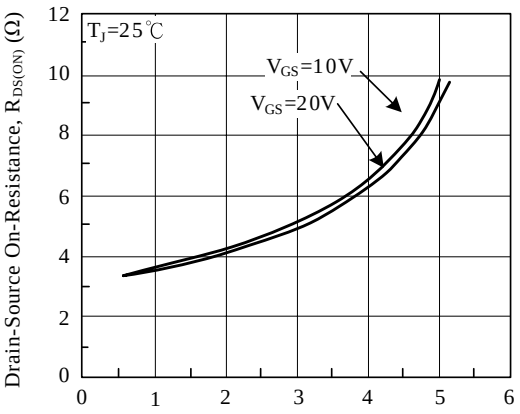
On-Region Characteristics



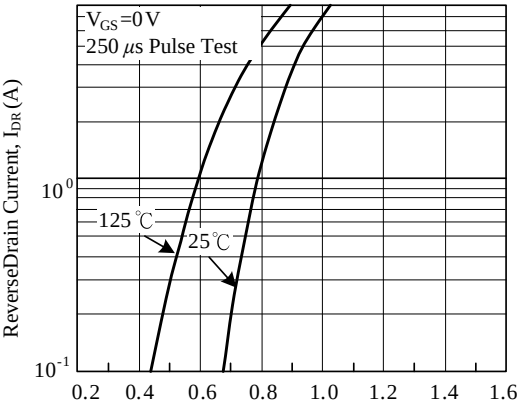
Transfer Characteristics468



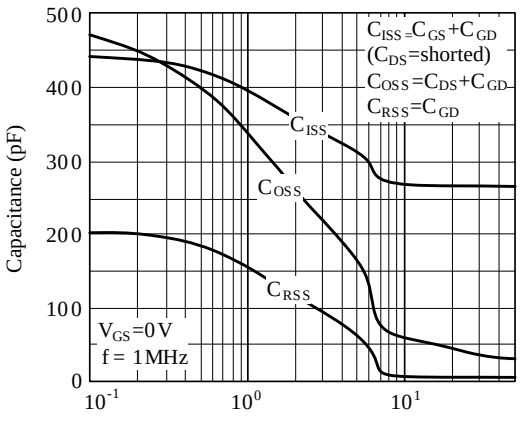
On-Resistance Variation vs. Drain Current and Gate Voltage



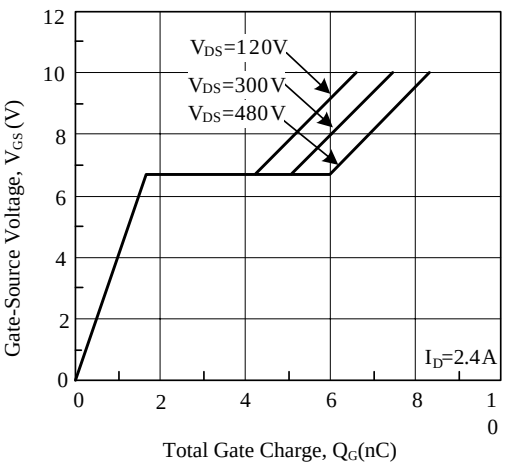
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitanc e vs. Drain-Source Voltag e

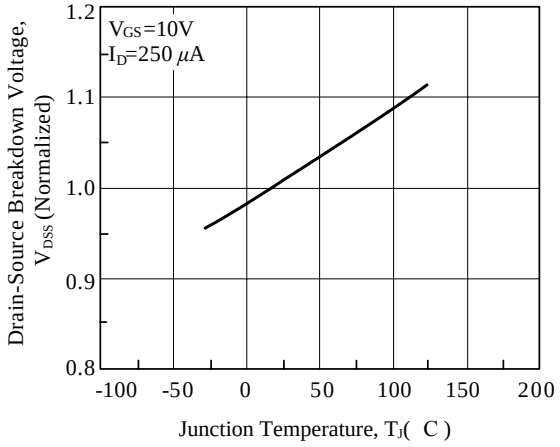


Gate Charge vs. Gate Charge Voltage

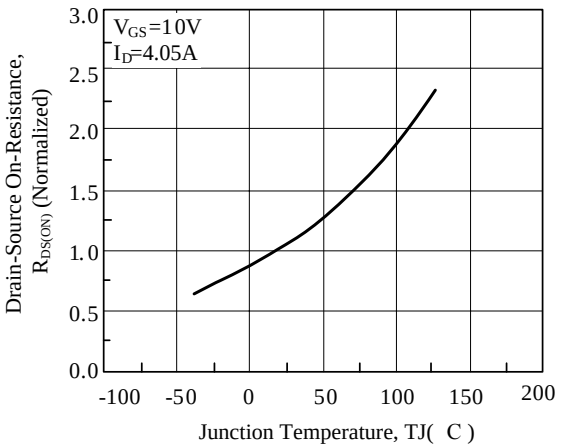


■ TYPICAL CHARACTERISTICS(Cont.)

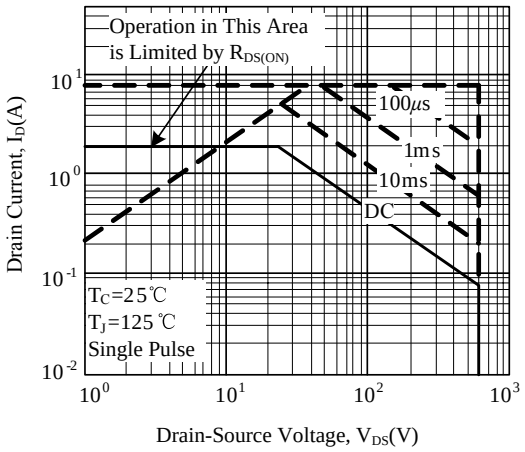
Breakdown Voltage vs Temperature



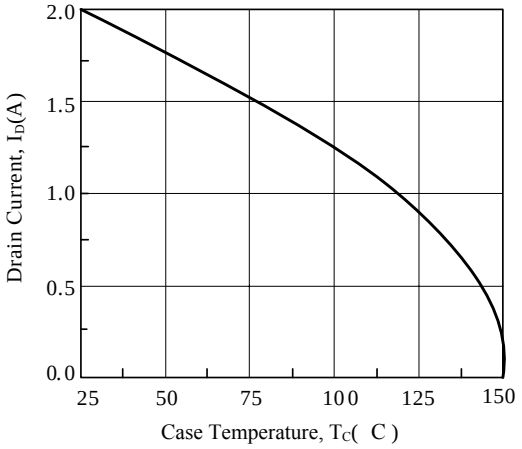
On-Resistance vs. Temperature



Max. Safe Operating Area



Max. Drain Current vs. Case Temperature



Thermal Response (TO-220)

