50 Amps，60Volts

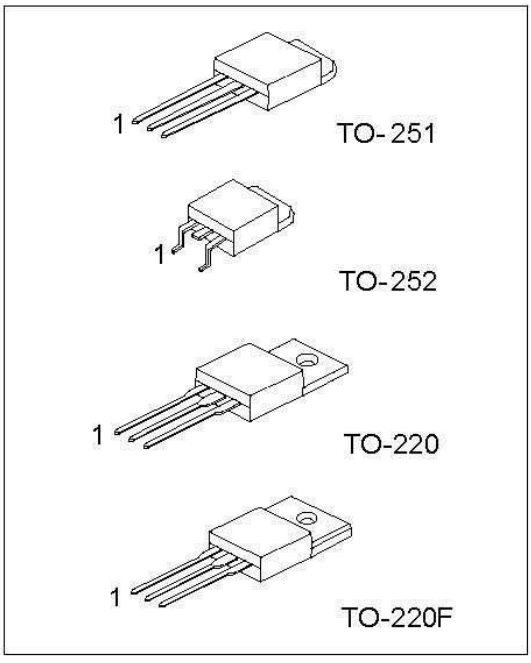
N-CHANNEL MOSFET

■ DESCRIPTION

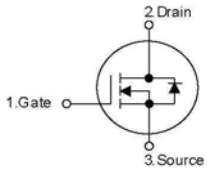
The ET50N06 is a N-Channel enhancement MOSFET and is designed to have better characteristics, such as superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for low voltage applications such as automotive DC/DC converters, and high efficiency switching for power management in portable and battery operated products.

■ FEATURES

- $R_{DS(ON)}$=0.023Ω@V_{GS}=10V
- Low gate charge(typical 31nC)
- Low reverse transfer capacitance(C_{RSS}=typical 80pF)
- Fast switching capability
- Avalanche energy specified
- Improved dv/dt capability,high ruggedness



■ SYMBOL



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

PARAMETER	SYMBOL	PATINGS	UNIT
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	±20	V

Drain Currenet Continuous	T_c=25℃	I_D	50	A
	T_c=100℃		35	A
Drain Current Pulsed(Note 1)		I_{DP}	200	A
Avalanche Energy	Repetitive(Note 1)	E_{AR}	13	mJ
	Single Pulse(Note 2)	E_{AS}	480	mJ
Peak Diode Recovery dv/dt(Note 3)		dv/dt	7.0	v/ns
Total Power Dissipation	T_c=25℃	P_D	120	W
	Derate above 25℃		0.8	w/℃
Operation Junction Temperature		T_J	-55 to+150	℃
Storage temperature		T_{STG}	-55~+150	℃

■ THERMAL DATA

PARAMETER	SYMBOL	TYP	MAX	UNIT
Thermal Resistance Junction-Ambient	θ_{JA}	-	62.5	℃/W
Thermal Resistance Junction-Case	θ_{JC}	-	1.24	℃/W
Thermal Resistance Case-Sink	θ_{CS}	0.5	-	℃/W

■ ELECTRICAL CHARACTERISTICS（T_J=25℃, 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	60			V
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS}=60V,V_{GS}=0V			1	μA
			V_{DS}=48V,T_C=150℃			10	μA
Gate-Body Leakage Current	Forward	I_{GSS}	V_{GS}=20V,V_{DS}=0V			100	nA
	Reverse		V_{GS}=-20V,V_{DS}=0V			-100	nA
Breakdown Voltage Temperature		$\triangle BV_{DSS}/\triangle T_J$	I_D=250μA		0.06		V/℃
On Characteristics							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.2		3.8	V
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{DS}=10V,I_D=25A		0.019	0.023	Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=25V,V_{GS}=0V,f=1MHz		900	1220	pF
Output Capacitance		C_{OSS}			430	550	pF
Reverse Transfer Capacitance		C_{RSS}			80	100	pF

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Switching Characteristics						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=30V,I_D=25A,R_G=50Ω (Note4, 5)		40	60	ns
Rise Time	t_R			100	200	ns
Turn-Off Delay Time	$t_{D(OFF)}$			90	180	ns
Fall Time	t_F			80	160	ns
Total Gate Charge	Q_G	V_{DS}=48V,V_{GS}=10V,I_D=50A (Note4, 5)		30	40	nC
Gate-Source Charge	Q_{GS}			9.6	-	nC
Gate-Drain Charge	Q_{GD}			10	-	nC
Drain-Source Diode Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=50A			1.5	V
Continuous Drain-Source Current	I_{SD}				50	A
Pulsed Drain-Source Current	I_{SM}				200	A
Reverse Recovery Time	t_{RR}			54		ns

Reverse Recovery Charge	Q_{RR}			81		nC

Note:1.Repetitive Rating: Pulse width limited by maximum junction temperature

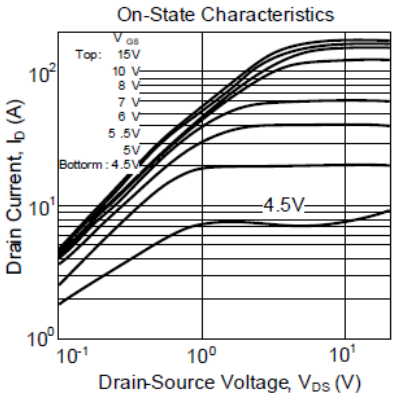
2.L=5.6mH,I_{AS}=50A,V_{DD}=25V,R_G=0Ω,Starting T_J=25℃

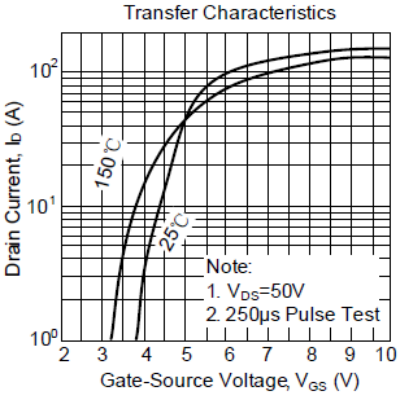
3. I_{SD}≤50A,di/dt≤300A/μs, V_{DD}≤BV_{DSS}, Starting T_J=25℃

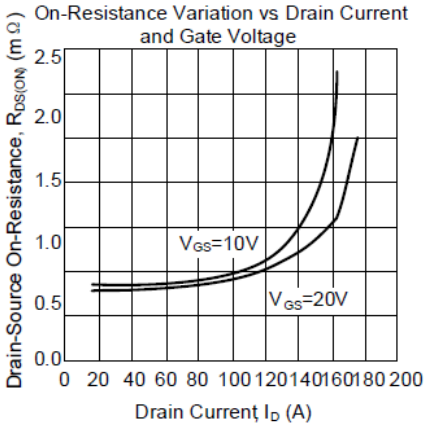
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

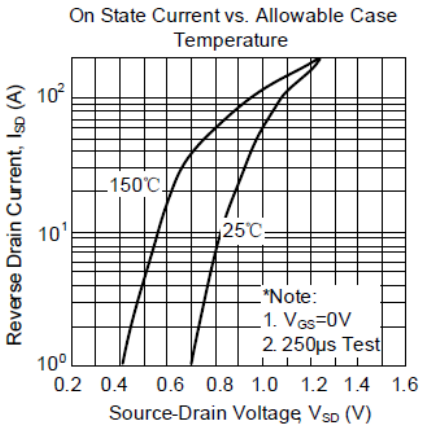
5. Essentially Independent of Operating Temperature

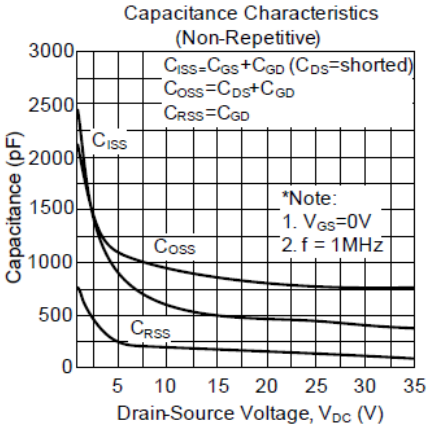
■ TYPICAL CHARACTERISTICS

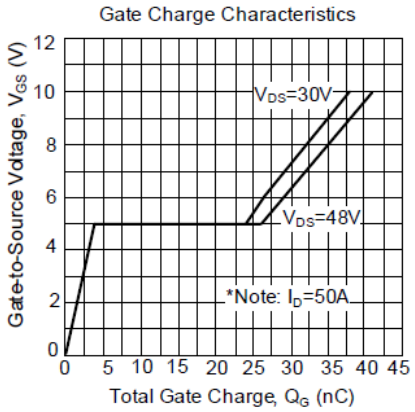












■ TYPICAL CHARACTERISTICS(Cont.)