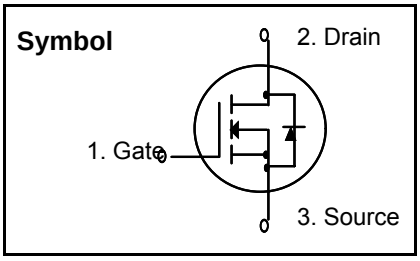
STEK

ET- 830

N-Channel MOSFET

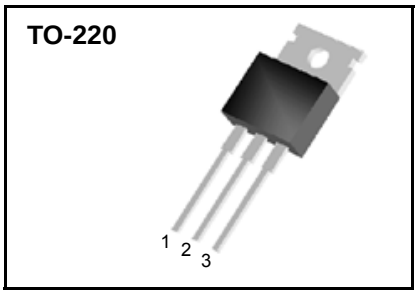
Features

- $R_{DS(on)}$ (Max 1.4 Ω)@V_{GS}=10V
- Gate Charge (Typical 25nC)
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range (150°C)



General Description

This Power MOSFET is produced using Integral's advanced planar stripe, DMOS technology. This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. These devices are well suited for high efficiency switching DC/DC converters, switch mode power supply, DC-AC converters for uninterruped power supply, motor control.



Absolute Maximum Ratings

Symbol	Parameter		Value	Units
V_{DSS}	Drain to Source Voltage		500	V
I_D	Continuous Drain Current(@T_C = 25°C)		5.0	A
	Continuous Drain Current(@T_C = 100°C)		3.0	A
I_{DM}	Drain Current Pulsed	(Note 1)	20	A
V_{GS}	Gate to Source Voltage		±30	V
E_{AS}	Single Pulsed Avalanche Energy	(Note 2)	292	mJ
E_{AR}	Repetitive Avalanche Energy	(Note 1)	8.75	mJ
dv/dt	Peak Diode Recovery dv/dt	(Note 3)	5.5	V/ns
P_D	Total Power Dissipation(@T_C = 25 °C)		87.5	W
	Derating Factor above 25 °C		0.70	W/°C
T_{STG}, T_J	Operating Junction Temperature & Storage Temperature		- 55 ~ 150	°C
T_L	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.		300	°C

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	-	1.43	°C/W
$R_{\theta CS}$	Thermal Resistance, Case to Sink	-	0.5	-	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	-	-	62.5	°C/W

Electrical Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	500	--	--	V
ΔBV_{DSS} / ΔT_J	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, Referenced to 25°C	--	0.50	--	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 500 V, V_{GS} = 0 V	--	--	10	μA
		V_{DS} = 400 V, T_C = 125°C	--	--	100	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 μA	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 2.5 A (Note 4)	--	1.15	1.40	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	--	680	900	pF
C_{oss}	Output Capacitance		--	85	110	pF
C_{rss}	Reverse Transfer Capacitance		--	15	20	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 250V, I_D = 5.0 A, R_G = 25 Ω (Note 4, 5)	--	20	50	ns
t_r	Turn-On Rise Time		--	40	90	ns
$t_{d(off)}$	Turn-Off Delay Time		--	90	190	ns
t_f	Turn-Off Fall Time		--	45	100	ns
Q_g	Total Gate Charge	V_{DS} = 400 V, I_D = 5.0A, V_{GS} = 10 V (Note 4, 5)	--	25	33	nC
Q_{gs}	Gate-Source Charge		--	5	--	nC
Q_{gd}	Gate-Drain Charge		--	10	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	5.0	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	20	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 5.0 A	--	--	1.5	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0 V, I_S = 5.0 A, dI_F / dt = 100 A/μs (Note 4)	--	250	--	ns
Q_{rr}	Reverse Recovery Charge		--	2.2	--	μC

Notes:
1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L = 21.0mH, I_{AS} = 5.0A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C
3. I_{SD} ≤ 5.0A, di/dt ≤ 300μA/s, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C
4. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%
5. Essentially independent of operating temperature