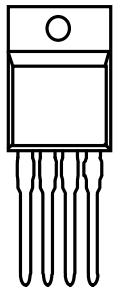
FEATURES

- Precision fixed operating frequency (70KHz)
- Pulse by pulse over current limiting
- Over Current Protection
- Over Voltage Protection(min. 23V)
- Internal thermal shutdown function
- Under voltage lockout
- Internal high voltage sense FET
- Auto restart

TO-220F

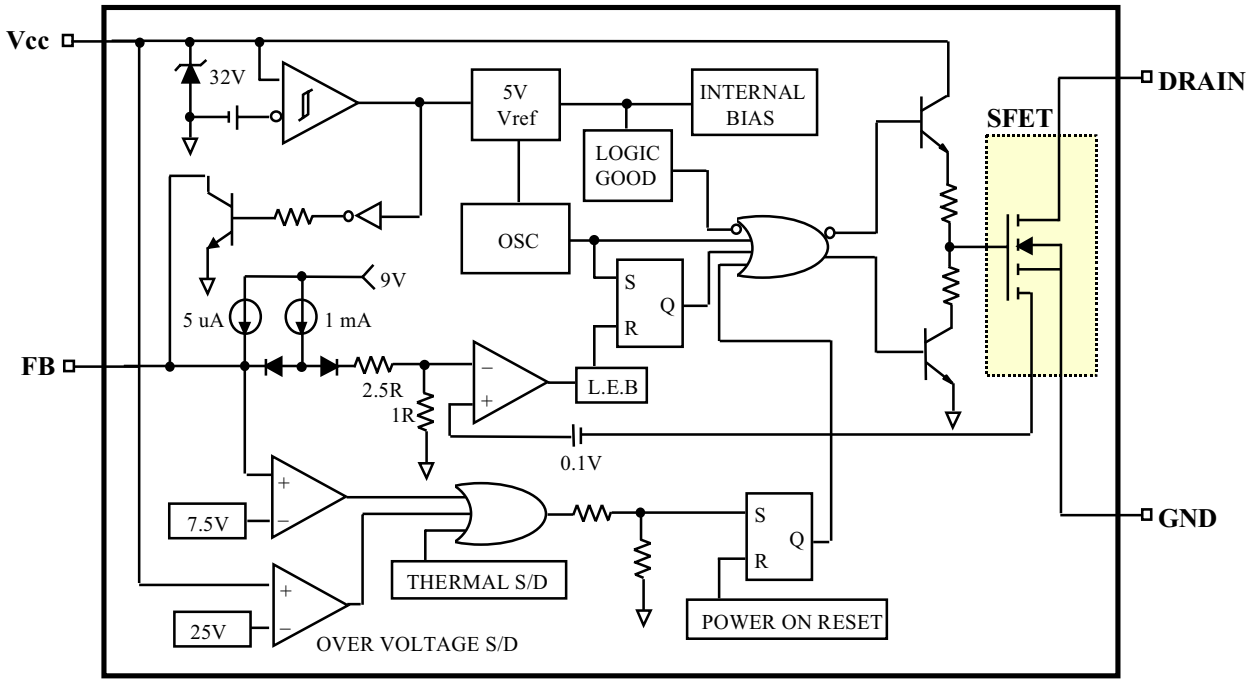


1.GND 2.DRAIN 3.Vcc 4.FB

PRODUCT SUMMARY

Part Number	BVdss	Rds(on)	ID
KA1M0565R	650V	2.2Ω	5A

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Drain - Source(GND) Voltage (1)	V_{DSS}	650	V
Drain - Gate Voltage (R_{GS} =1MΩ)	V_{DGR}	650	V
Gate - Source(GND) Voltage	V_{GS}	±30	V
Drain Current Pulsed (2)	I_{DM}	20	A_{DC}
Single Pulsed Avalanche Energy (3)	E_{AS}	230	mJ
Avalanche Current	I_{AS}	-	A
Continuous Drain Current (Tc = 25℃)	I_D	5.0	A_{DC}
Continuous Drain Current (Tc = 100℃)	I_D	3.5	A_{DC}
Supply Voltage	V_{CC}	30	V
Analog Input Voltage Range	V_{FB}	-0.3 ~ V_{SD}	V
Total Power Dissipation	P_D (wt H/S)	140	W
	Derating	1.11	W/℃
Operating Temperature	T_{OPR}	- 25 ~ + 85	℃
Storage Temperature	T_{STG}	- 55 ~ + 150	℃

Notes: (1) T_J = 25℃ to 150 ℃
(2) Repetitive rating : Pulse width limited by maximum junction temperature
(3) L = 30mH, V_{DD} =50V, R_G = 27Ω, starting Tj = 25℃

ELECTRICAL CHARACTERISTICS (SFET part)

(Ta = 25℃ unless otherwise specified)

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	650	-	-	V	V_{GS}=0V, I_D=50uA
I_{DSS}	Zero Gate Voltage Drain Current	-	-	50	uA	V_{DS}=Max, Rating,V_{GS}=0V
		-	-	200	uA	V_{DS}=0.8Max,Rating,V_{GS}=0V TC=125 ℃
R_{DS}(on)	Static Drain-Source On Resistance(4)	-	1.76	2.2	Ω	V_{GS} = 10V, I_D = 2.5A

ELECTRICAL CHARACTERISTICS (SFET part continued)

(Ta = 25℃ unless otherwise specified)

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
g_{fs}	Forward Transconductance(4)	2.5	-	-	mho	V_{DS}=50V, I_D=2.5A
C_{iss}	Input Capacitance	-	1457	-	pF	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz
C_{oss}	Output Capacitance	-	130	-		
C_{rss}	Reverse Transfer Capacitance	-	38.8	-		
td(on)	Turn On Delay Time	-	-	60	nS	V_{DD} = 0.5BV_{DSS} , I_D = 5.0A (MOSFET switching time are essenstialy independent of operating temperature)
tr	Rise Time	-	-	150		
td(off)	Turn Off Delay Time	-	-	300		
tf	Fall Time	-	-	130		
Qg	Total Gate Charge (Gate-Source + Gate-Drain)	-	-	56	nC	V_{GS} = 10V, I_D = 5.0A V_{DS} = 0.5BV_{DSS} (MOSFET switching time are essenstialy independent of operating temperature)
Qgs	Gate-Source Charge	-	10.3	-		
Qgd	Gate-Drain(Miller) Charge	-	22.3	-		

Notes: (1) T_J = 25℃ to 150 ℃
(2) Repetitive rating : Pulse width limited by maximum junction temperature
(3) L = 30mH, V_{DD} =50V, R_G = 25Ω, starting Tj = 25℃
(4) Pulse Test : Pulse width ≤ 300uS, Duty Cycle ≤ 2 %

ELECTRICAL CHARACTERISTICS (Control part)

(Ta = 25℃ unless otherwise specified)

Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
REFERENCE SECTION						
Vref	Output Voltage (Note 1)	4.80	5.00	5.20	V	Ta = 25℃
Vref/ ΔT	Temperature Stability (Note 1&2)	-	0.3	0.6	mV/℃	-25℃≤Ta ≤+85℃
OSCILLATOR SECTION						
FOSC	Initial Accuracy	61	67	73	KHz	Ta = 25℃
ΔF / ΔT	Frequency Change with Temperature (Note 2)	-	±5	±10	%	-25℃≤Ta ≤+85℃
PWM SECTION						
DMAX	Maximum Duty Cycle	74	77	80	%	
FEEDBACK SECTION						
I FB	Feedback Source Current	0.7	0.9	1.1	mA	Ta = 25℃, 0 V≤ Vfb ≤3V
Idelay	Shutdown Delay Current	4.0	5.0	6.0	uA	Ta = 25℃, 5 V≤Vfb≤VSD
OVER CURRENT PROTECTION SECTION						
IL(MAX)	Over Current Protection	3.08	3.5	3.92	A	Max. Inductor Current
UVLO SECTION						
Vth(H)	Start Threshold Voltage	14	15	16	V	
Vth(L)	Minimum Operating Voltage	9	10	11	V	After turn on

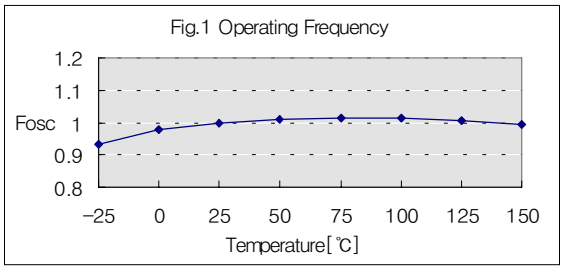
ELECTRICAL CHARACTERISTICS (Continued)

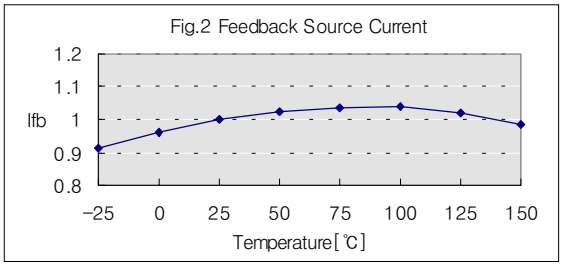
(Ta = 25℃ unless otherwise specified)

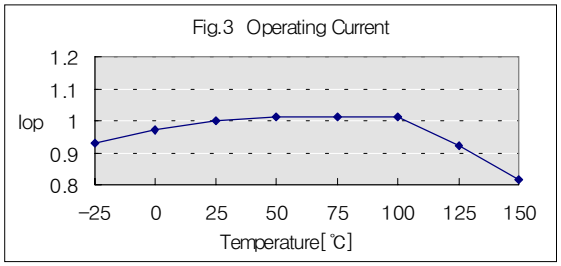
Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
TOTAL STANDBY CURRENT SECTION						
I_{ST}	Start up Current	0.1	0.3	0.45	mA	V_{CC} = 14V
I_{OPR}	Operating Supply Current (control part only)	6	12	18	mA	Ta = 25℃
V_Z	Vcc Zener Voltage	30	32.5	35	V	I_{CC} = 20mA
SHUTDOWN SECTION						
V_{SD}	Shutdown Feedback Voltage	6.9	7.5	8.1	V	
T_{SD}	ThermalShutdownTemperature(Tj)	140	160	-	℃	(Note 1)
Vovp	Over Voltage Protection Voltage	23	25	28	V	

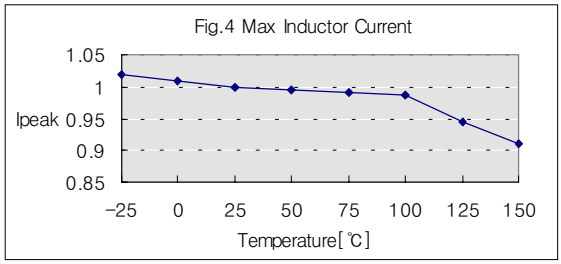
Notes: (1) These parameters, although guaranteed,are not 100% tested in production
(2) These parameters, although guaranteed, are tested in EDS(wafer test) process

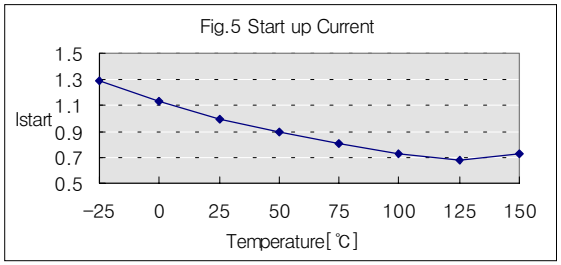
TYPICAL PERFORMANCE CHARACTERISTICS

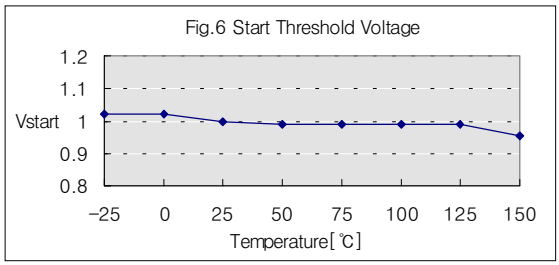


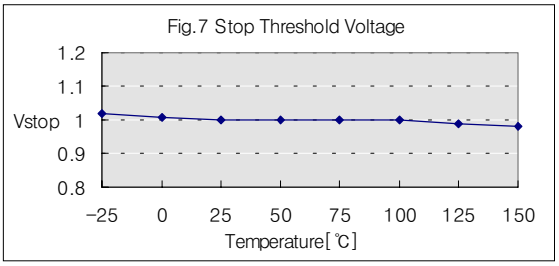


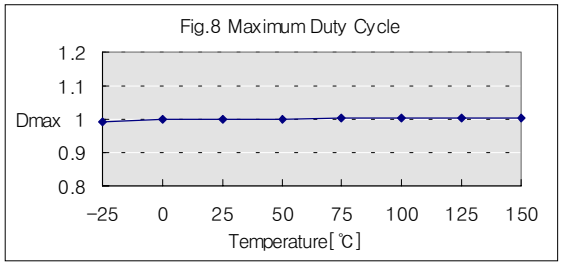




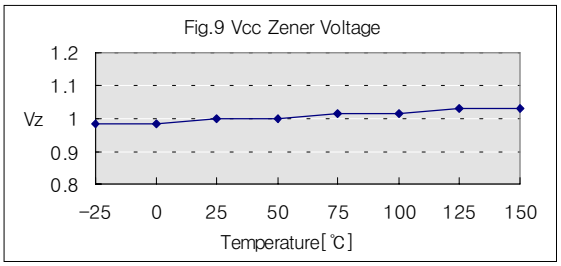


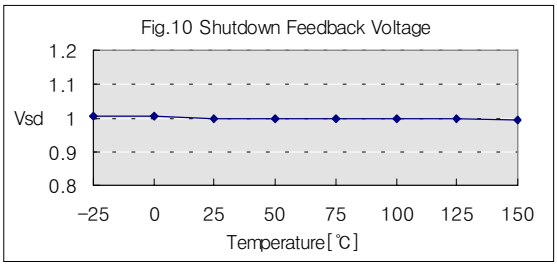


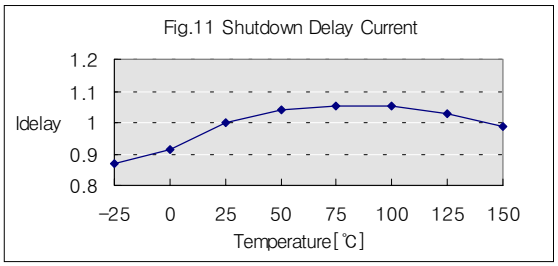


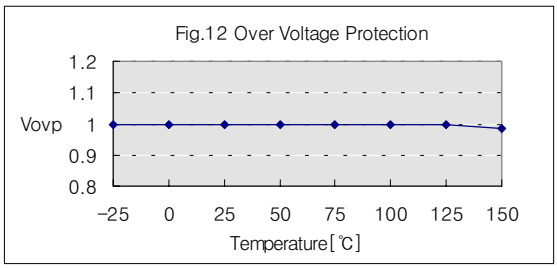


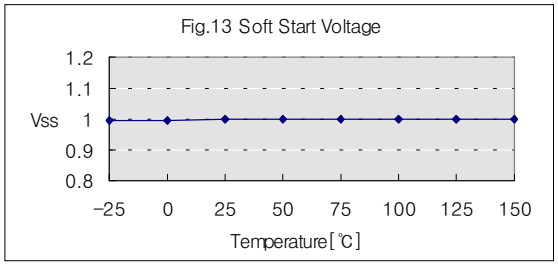
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

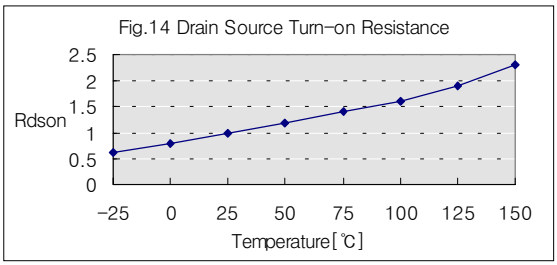












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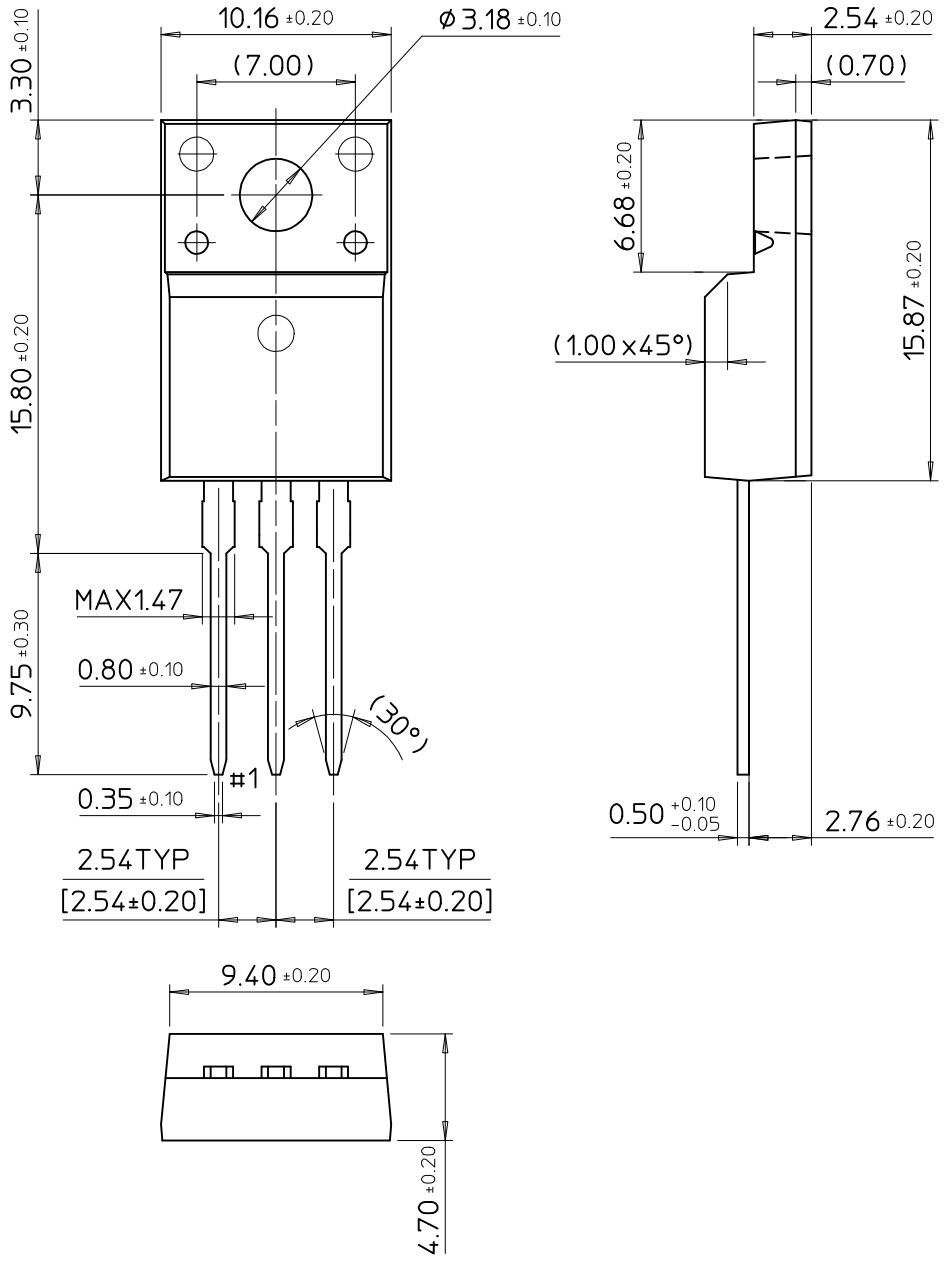
Dimensions in Milimeters



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