Global Semiconductor

MCIRF4N65 MFIRF4N65
MKIRF4N65 MJIRF4N65

POWER MOSFET

I_D = 4A
V_{DS} = 650V
$R_{DS(on)MAX}$ = 2.3Ω

Description/ Features

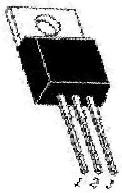
The MCIRF4N65 is used an advanced termination scheme to provide enhanced voltage-blocking capability without degrading performance over time. The new energy efficient design also offers a drain-to-source diode with a fast recovery time. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

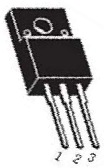
- 150℃ Tj operation
- Low Power Loss & Low cost
- Fast Switching
- RoHS Compliant

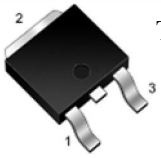
Major Ratings and Characteristics

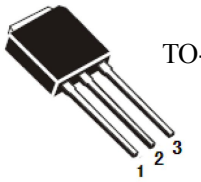
Characteristics	Values	Units
I_{DS}	4	A
I_{DM}	16	A
V_{DS}	650	V
V_{GS}	±30	V
T_J	150	℃
T storage	-55 ~150	℃

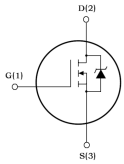
Case Styles


TO-220


TO-220F


TO-252


TO-251



1、 GATE
2、 DRAIN
3、 SOURCE

Ordering Information

Part Number	Package	Packaging
MCIRF4N65	TO-220	Tube
MFIRF4N65	TO-220F	Tube
MJIRF4N65	TO-251	Tube
MKIRF4N65	TO-252	Tube & Tape & Reel

Absolute Maximum Rating (Tamb = 25℃)

Parameter	Symbol	Value		Unit
Drain-Source Voltage	V_{DS}	650		V
Gate-Source Voltage	V_{GS}	±30		V
Drain Current-Pulsed	I_{DM}	16		A
Total Dissipation	P_D	TO-220	70	W
		TO-220F	30	
		TO-251	50	
		TO-252	50	
Junction Temperature	T_J	150		℃
Storage Temperature	$T_{stg.}$	-55~150		℃
Single Pulse Avalanche Energy	E_{AS}	280		mJ

Electrical Characteristics(Tamb=25℃)

Characteristics	Symbol	Test Condition	MIN.	MAX.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250uA	650	-	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS},I_D=250uA	2	4	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V	-	10	uA
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=4A	-	1.4	V
Forward Trans conductance	G_{fs}	V_{DS}=10V, I_D=2.0A	1.5	-	S
Gate-Body Leakage Current(Vds=0V)	I_{GSS}	V_{GS}=±30V	-	±100	nA
Static Drain-Source On Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=2.0A	-	2.3	Ω
Thermal Resistance Junction-Case	R_{thJ-C}	TO-220	-	2	℃/W
		TO-220F	-	2.5	
		TO-251	-	2.32	
		TO-252	-	2.32	

Dynamic Characteristics(Tamb=25℃)

Characteristics	Symbol	Test Condition	MIN.	TYP.	MAX.	Unit
Input Capacitance	C_{ISS}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	-	558	720	pF
Output Capacitance	C_{OSS}		-	62	85	pF
Reverse Transfer Capacitance	C_{RSS}		-	7	10	pF

Switching Characteristics(T_{amb}=25℃)

Characteristics	Symbol	Test Condition	MIN.	TYP.	MAX.	Unit
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=300V,I_D=4.0A, R_G=25Ω	-	20	40	nS
Turn-On Rise Time	T_r		-	30	70	nS
Turn-Off Delay Time	$T_{d(off)}$		-	60	100	nS
Turn-Off Rise Time	T_f		-	35	85	nS
Total Gate Charge	Q_g	V_{DS}=480V,I_D=4.0A, V_{GS}=10V	-	20	40	nC
Gate-Source Charge	Q_{gs}		-	3	-	nC
Gate-Drain Charge	Q_{gd}		-	7	-	nC

Drain-Source Diode Maximum Ratings And Characteristics(Tamb=25℃)

Characteristics	Symbol	Test Condition	MIN.	TYP.	MAX.	Unit
Max. Diode Forward Current	Is		-	-	4	A
Max. Pulsed Forward Current	I_{SM}		-	-	16	A
Diode Forward Voltage	V_{SD}		-	-	1.4	V
Reverse Recovery Time	Trr	V_{DS}=480V,I_D=4.0A, V_{GS}=10V	-	320	-	nS
Reverse Recovery Charge	Qrr		-	2.5	-	uC

Characteristics Curve

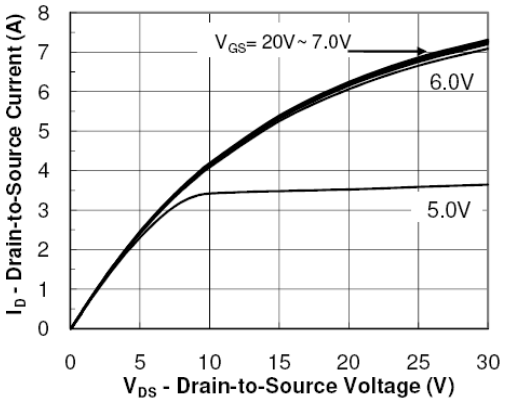


Figure1.Output Characteristic

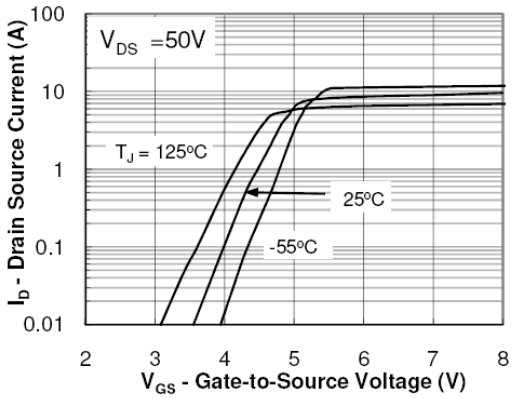


Figure2.Transfer Characteristic

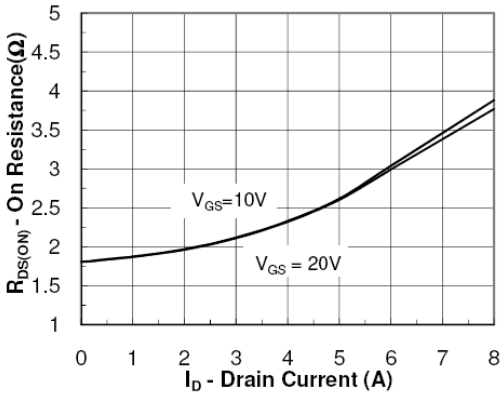


Figure3.On Resistance Vs Drain Current

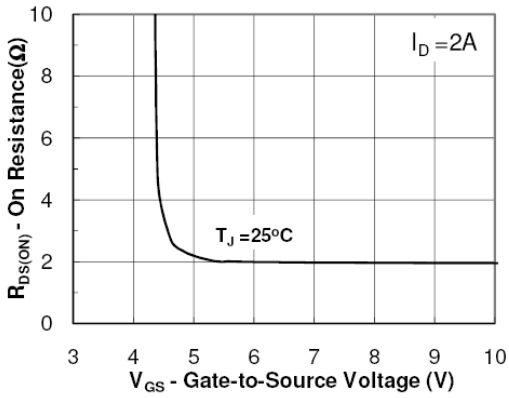


Figure4.On Resistance Vs Gate Source Voltage

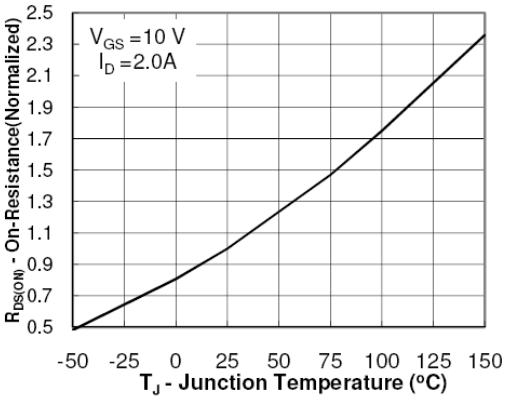


Figure5.On Resistance Vs Junction Temperature

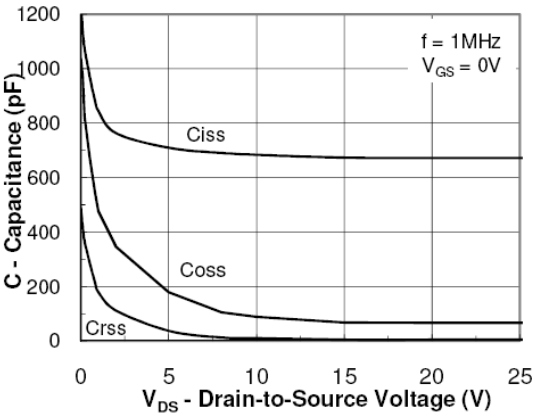


Figure6.Capacitance

Characteristics Curve

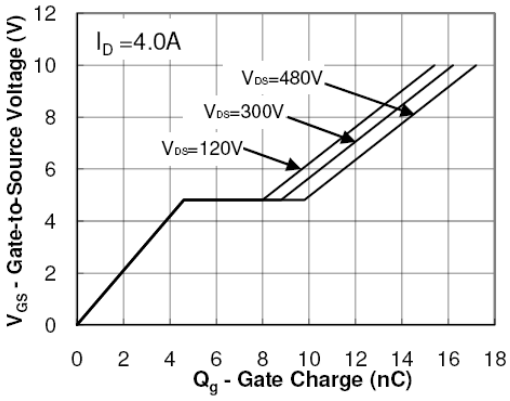


Figure7.Gate Charge Waveform

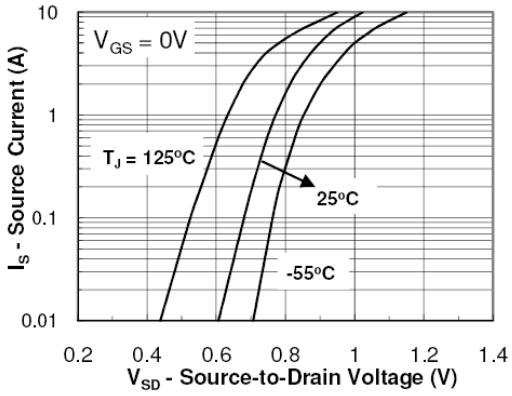


Figure8.Source-Drain Diode Forward Voltage

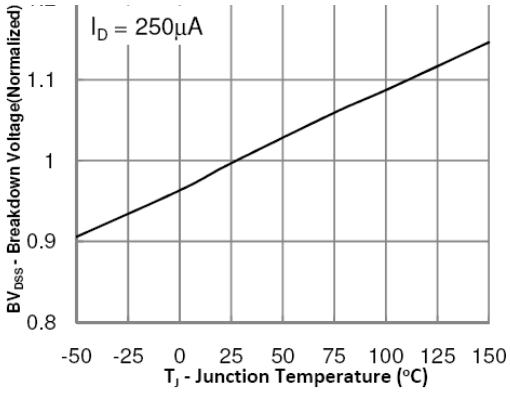
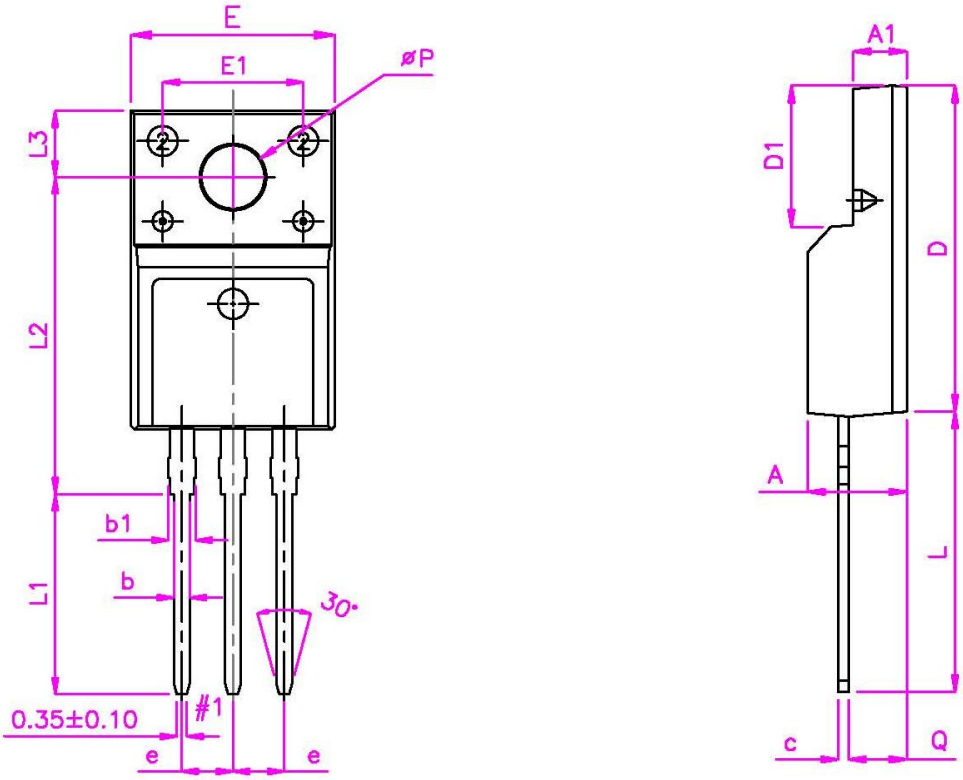


Figure9.Breakdown Voltage Vs Junction

TO-220F Mechanical Data

UNIT.: mm

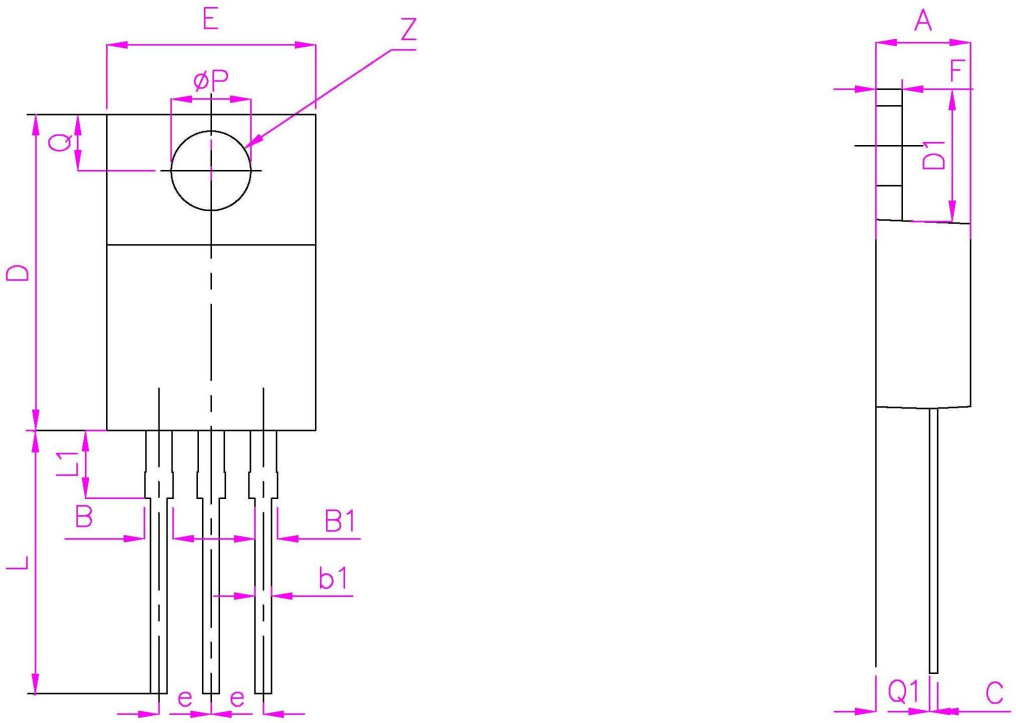
Symbol	MIN.	NOM.	MAX.	Symbol	MIN.	NOM.	MAX.
A	4.2	-	4.70	E1	-	7.0	-
A1	2.30	-	2.90	e	-	2.54	-
b	0.45	-	0.9	L	12.5	-	14.3
b1	1.1	-	1.7	L1	9.45	-	10.05
c	0.35	-	0.9	L2	15	-	16
D	14.5	-	17	L3	3.2	-	4.4
D1	6.10	-	9.0	ΦP	3.0	-	3.3
E	9.6	-	10.3	Q	2.5	-	2.90



TO-220 Mechanical Data

UNIT.: mm

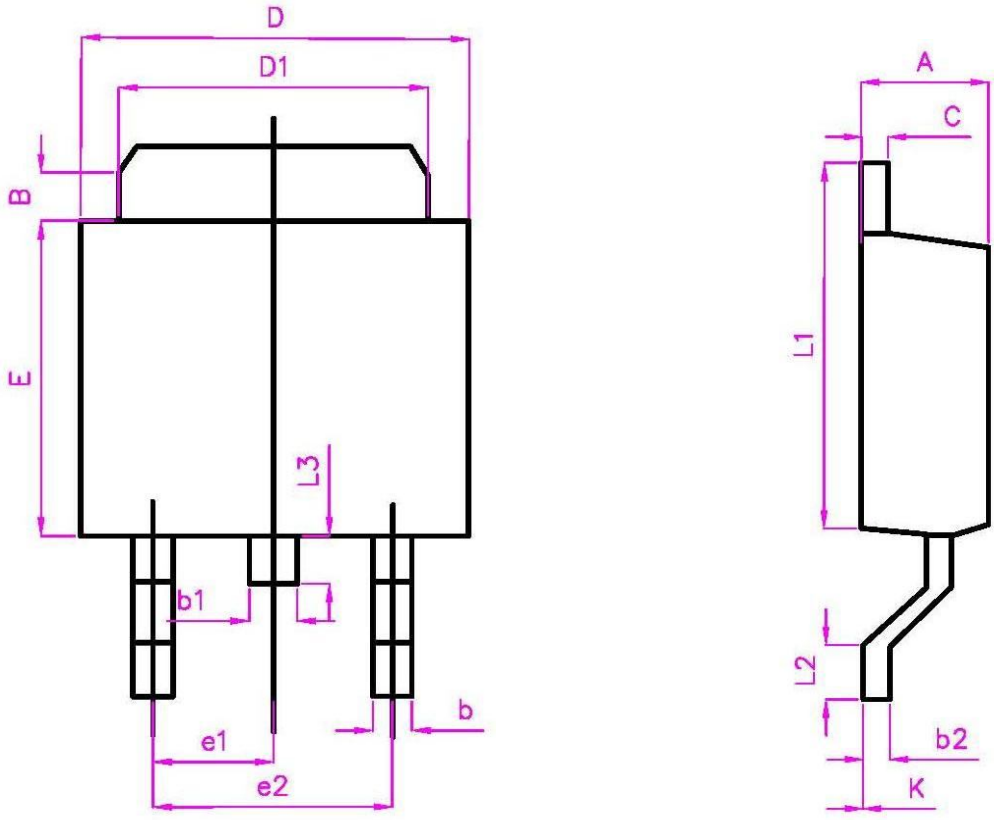
Symbol	MIN.	NOM.	MAX.	Symbol	MIN.	NOM.	MAX.
A	4.0	-	4.80	E	9.90	-	10.70
B	1.20	-	1.40	e	-	2.54	-
B1	1.0	-	1.30	F	1.10	-	1.40
b1	0.65	-	1.00	L	12.50	-	14.50
c	0.40	-	0.55	L1	3.00	3.50	4.00
D	15.0	-	16.5	Q	2.50	-	3.00
D1	5.90	-	6.90	Q1	2.00	-	2.90
				P	-	3.80	-



TO-252 Mechanical Data

UNIT.: mm

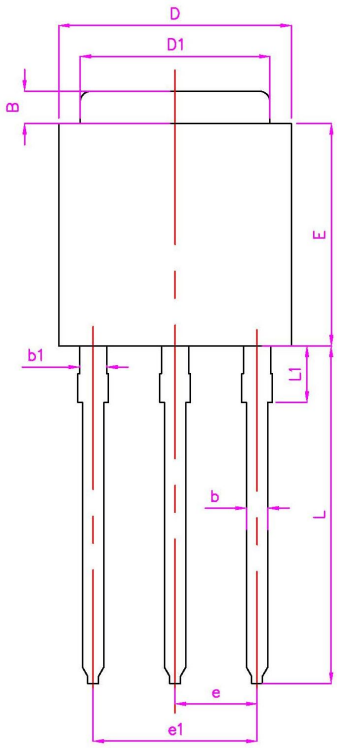
Symbol	MIN.	NOM.	MAX.	Symbol	MIN.	NOM.	MAX.
A	2.10	-	2.50	E	5.30	-	6.30
B	0.85	-	1.25	e1	2.25	-	2.35
b	0.50	-	0.80	e2	4.45	-	4.75
b1	0.50	-	0.90	L1	9.20	-	10.60
b2	0.45	-	0.70	L2	0.90	-	1.75
C	0.45	-	0.70	L3	0.60	-	1.10
D	6.30	-	6.75	K	-0.1	-	0.10
D1	5.10	-	5.50				

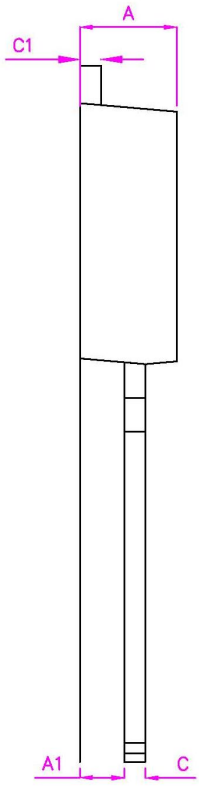


TO-251 Mechanical Data

UNIT.: mm

Symbol	MIN.	NOM.	MAX.	Symbol	MIN.	NOM.	MAX.
A	2.10	-	2.50	D1	5.10	-	5.50
A1	0.95	-	1.30	E	5.30	-	6.30
B	0.80	-	1.25	e	-	2.30	-
b	0.50	-	0.80	L	7.00	-	9.20
b1	0.70	-	0.90	L1	1.45	-	1.95
c	0.45	-	0.70	R	-	0.30	-
C1	0.45	-	0.70				
D	6.35	-	6.80				





Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
Qualification Standards can be found on GS's Web site.
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