

POWER MOSFET

$$I_D = 7.0A$$

$$V_{DS} = 650V$$

$$R_{DS(on)MAX} = 1.5\Omega$$

Major Ratings and Characteristics

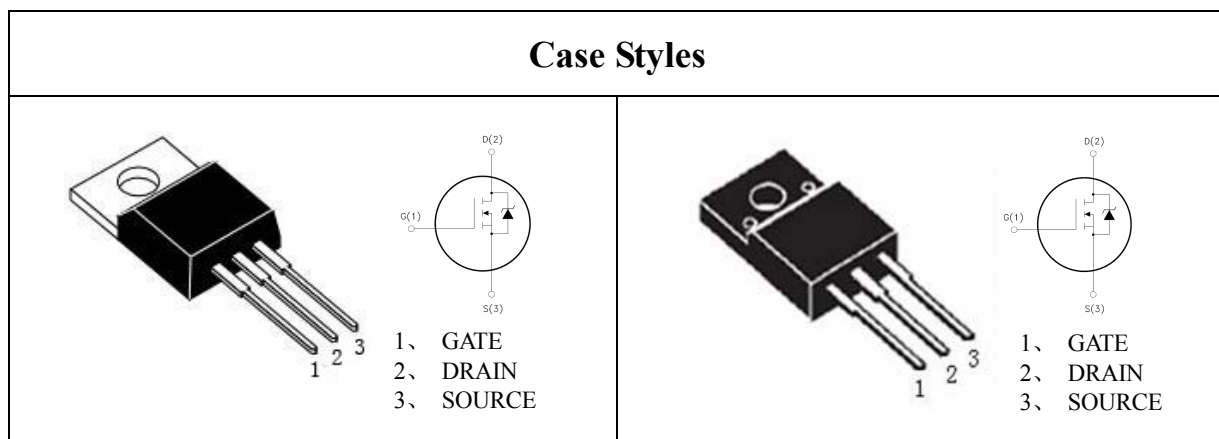
Characteristics	Values	Units
I_D	7.0	A
I_{DM}	28.0	A
V_{DS}	650	V
V_{GS}	± 30	V
T_J	150	$^{\circ}C$
T storage	-55 ~ 150	$^{\circ}C$

Description/ Features

The MCIRF7N65 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 $^{\circ}C$ Tj operation
- Low Power Loss & Low cost
- Fast Switching
- RoHS Compliant

Case Styles



Ordering Information

Part Number	Package	Packaging
MCIRF7N65	TO-220	Tube
MFIRF7N65	TO-220F	Tube

MFIRF7N65

MCIRF7N65

Absolute Maximum Rating (Ta = 25°C)

Parameter	Symbol	Value		Unit
Drain-Source Voltage	V _{DS}	650		V
Gate-Source Voltage	V _{GS}	±30		V
Drain Current-Pulsed	I _{DM}	28		A
Total Dissipation	P _D	TO-220	125	W
		TO-220F	45	
Junction Temperature	T _J	150		°C
Storage Temperature	T _{stg}	-55~150		°C
Single Pulse Avalanche Energy	E _{AS}	TO-220	500	mj
		TO-220F	500	

Electrical Characteristics(Tamb=25°C)

Characteristic	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		1	uA
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =7A		1.5	V
Forward Trans conductance	G _{fs}	V _{DS} =10V, I _D =3.5A	4		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 _S =3.5A		1.5	Ω
Thermal Resistance Junction-Case	R _{thJ-C}	TO-220		2.2	°C/W
		TO-220F		2.78	

Dynamic Characteristics(Tamb=25°C)

Characteristic	Symbol	Test Condition	MIN.	TYP.	MAX.	Unit
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, F=1.0MHz	-	1100	1430	pF
Output Capacitance	C _{OSS}		-	135	175	pF
Reverse Transfer Capacitance	C _{RSS}		-	16	21	pF



Switching Characteristics(Tamb=25°C)

Characteristic	Symbol	Test Condition	MIN.	TYP.	MAX.	Unit
Turn-On Delay Time	Td(on)	$V_{DD}=300V, I_D=7.0A,$ $R_G=25\Omega$	-	30	70	nS
Turn-On Rise Time	Tr		-	80	170	nS
Turn-Off Delay Time	Td(off)		-	65	140	nS
Turn-Off Rise Time	Tf		-	60	130	nS
Total Gate Charge	Qg	$V_{DS}=480V, I_D=7.0A,$ $V_{GS}=10V$	-	29	38	nC
Gate-Source Charge	Qgs		-	7	-	nC
Gate-Drain Charge	Qgd		-	14.5	-	nC

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

Characteristic	Symbol	Test Condition	MIN.	TYP.	MAX.	Unit
Max. Diode Forward Current	Is		-	-	7.0	A
Max. Pulsed Forward Current	ISM		-	-	28	A
Diode Forward Voltage	VSD	$V_{GS}=0V, I_S=7.0A,$	-	-	1.5	V
Reverse Recovery Time	Trr	$V_{GS}=0V, I_S=10A,$ $dI_F/dt=100A/uS$	-	320	-	nS
Reverse Recovery Charge	Qrr		-	2.4	-	uC

Characteristics Curve

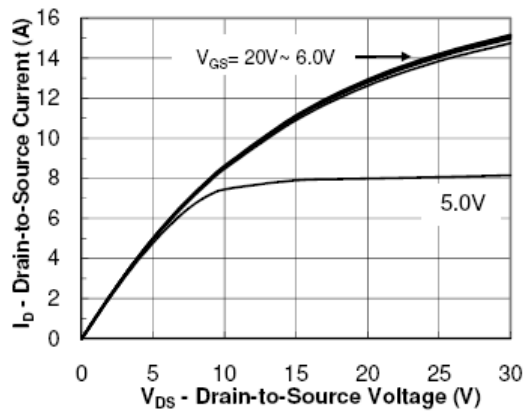


Figure1.Output Characteristic

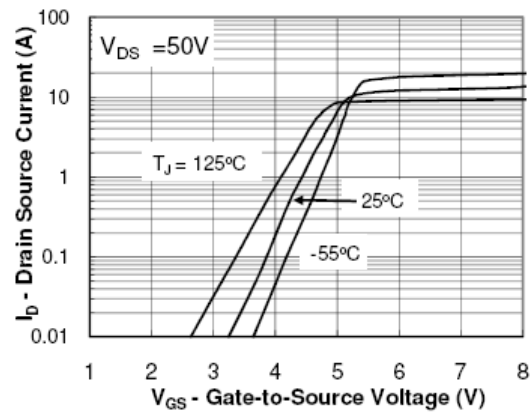


Figure2.Transfer Characteristic

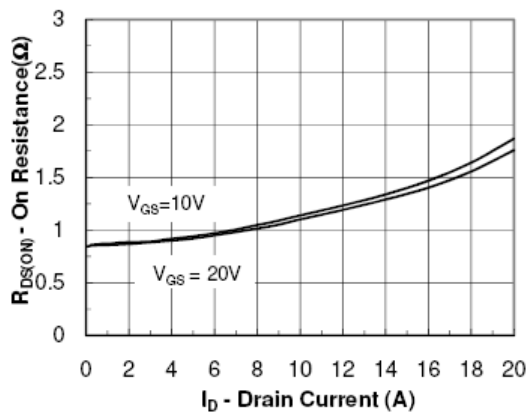


Figure3.On Resistance Vs Drain Current

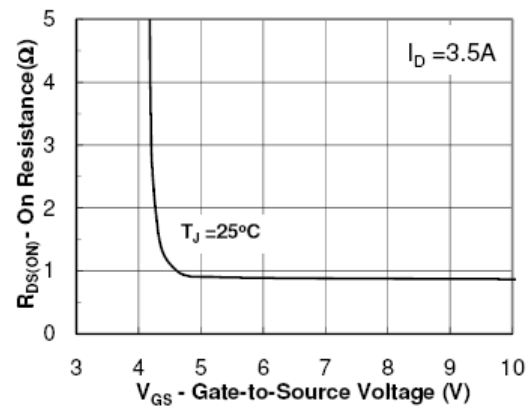


Figure4.On Resistance Vs Gate Source Voltage

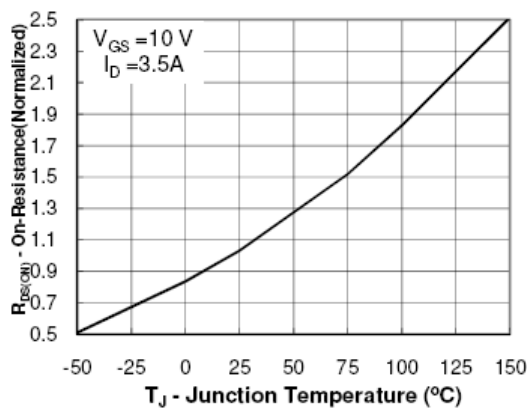


Figure5.On Resistance Vs Junction Temperature

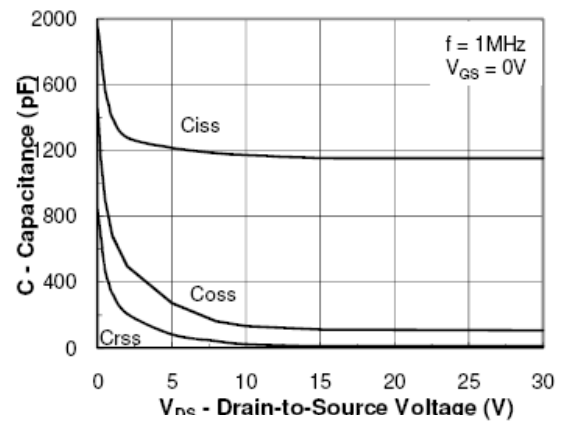


Figure6.Capacitance

Characteristics Curve

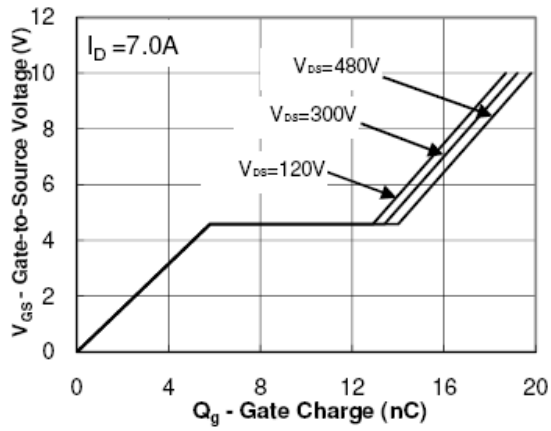


Figure7.Gate Charge Waveform

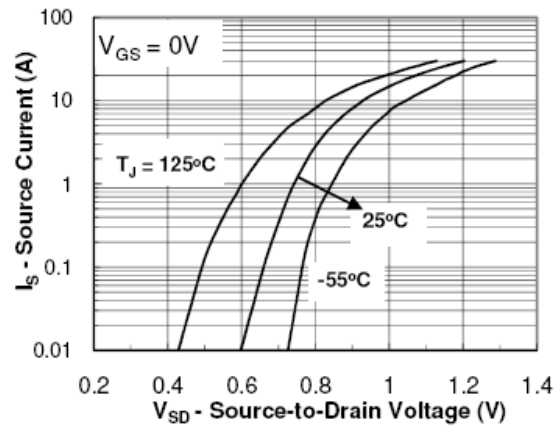


Figure8.Source-Drain Diode

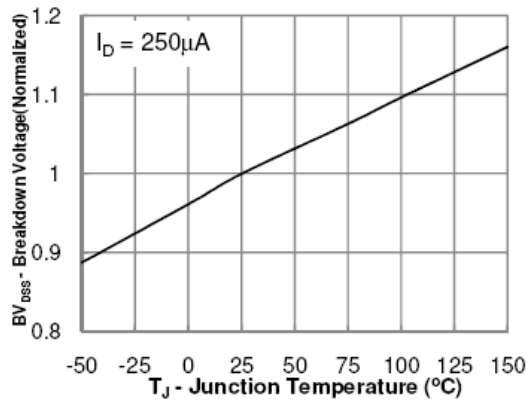


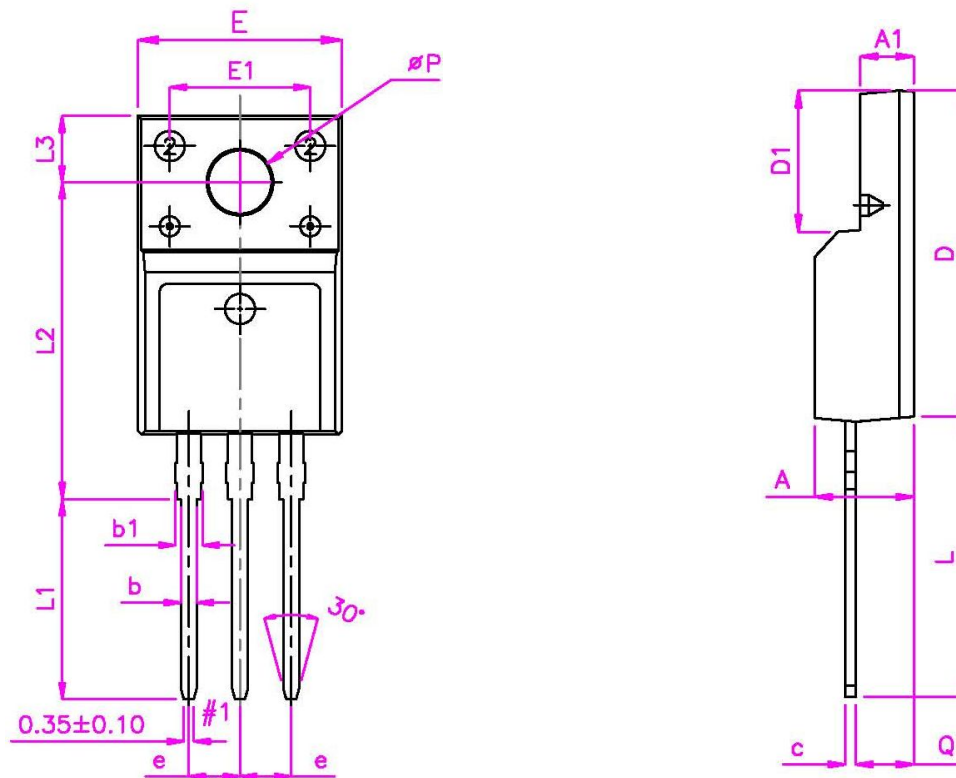
Figure9.Breakdown Voltage Vs Junction

MFIRF7N65
MCIRF7N65

TO-220F Mechanical Data

UNIT.: mm

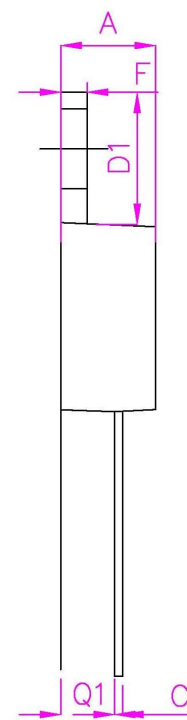
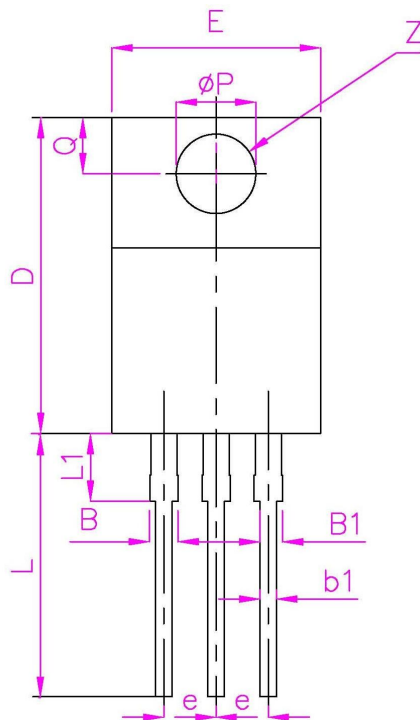
Symbol	MIN.	NOM.	MAX.	Symbol	MIN.	NOM.	MAX.
A	4.2	-	4.70	E1	-	7.0	-
A1	2.30	-	2.90	e	-	2.54	-
b	0.45	-	0.9	L	12.5	-	14.3
b1	1.1	-	1.7	L1	9.45	-	10.05
c	0.35	-	0.9	L2	15	-	16
D	14.5	-	17	L3	3.2	-	4.4
D1	6.10	-	9.0	ΦP	3.0	-	3.3
E	9.6	-	10.3	Q	2.5	-	2.90



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	-



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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