

POWER MOSFET

$$I_D = 7.0A$$

$$V_{DS} = 650V$$

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

Major Ratings and Characteristics

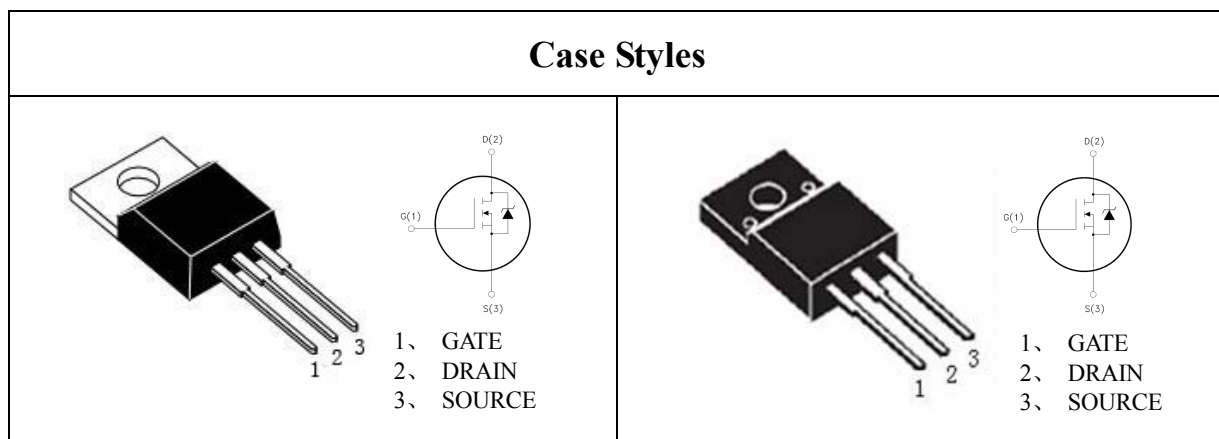
Characteristics	Values	Units
I_D	7.0	A
I_{DM}	28.0	A
V_{DS}	650	V
V_{GS}	± 30	V
T_J	150	$^{\circ}C$
T storage	-55 ~ 150	$^{\circ}C$

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	$V_{GS}=0V, I_S=10A,$ $dI_F/dt=100A/\mu S$	-	320	-	nS
Reverse Recovery Charge	Qrr		-	2.4	-	uC

Characteristics Curve

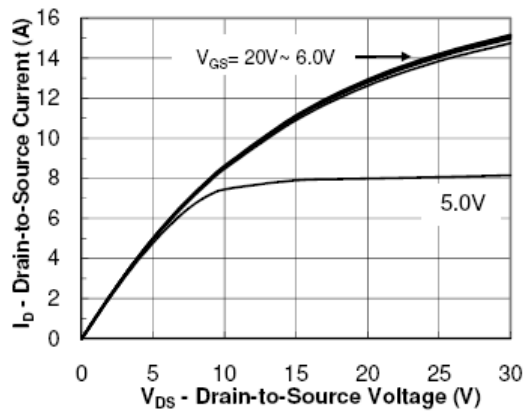


Figure1.Output Characteristic

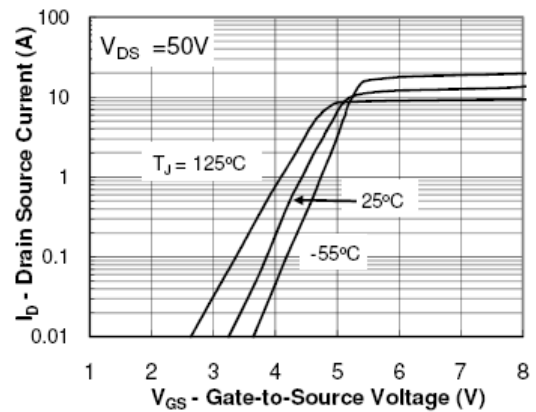


Figure2.Transfer Characteristic

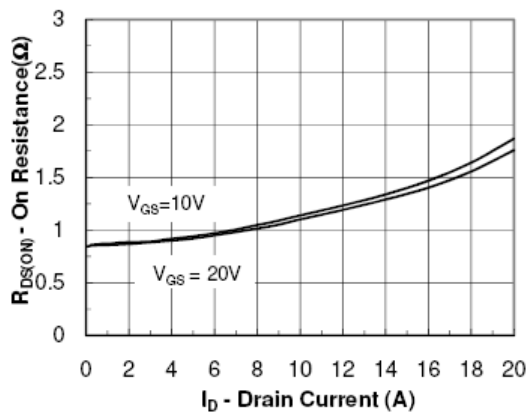


Figure3.On Resistance Vs Drain Current

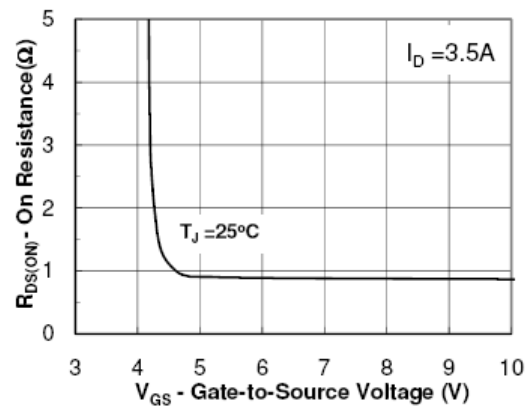


Figure4.On Resistance Vs Gate Source Voltage

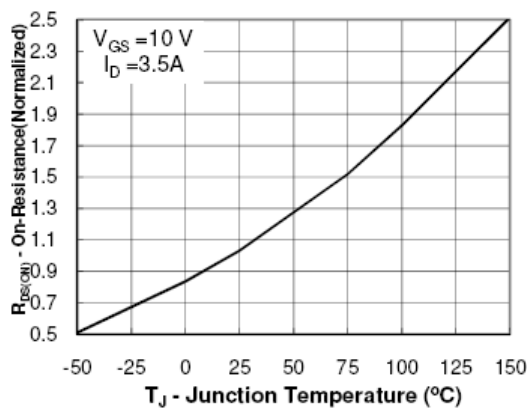


Figure5.On Resistance Vs Junction Temperature

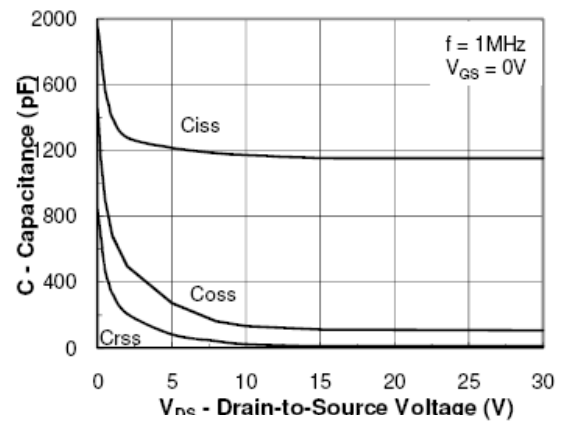


Figure6.Capacitance

Characteristics Curve

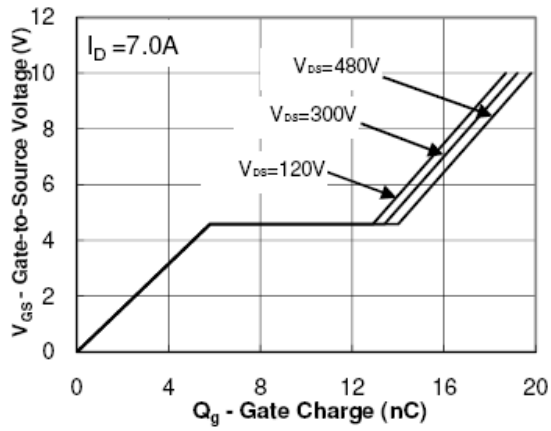


Figure7. Gate Charge Waveform

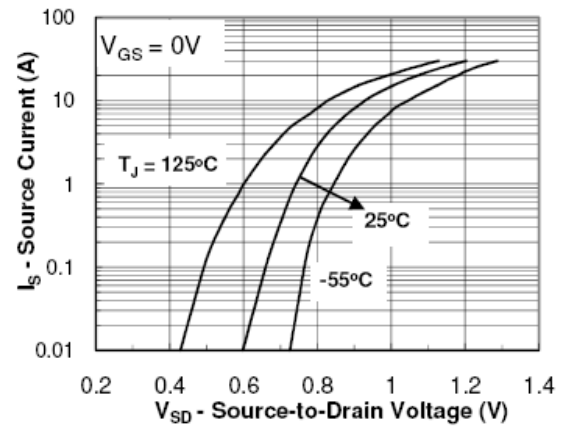


Figure8. Source-Drain Diode

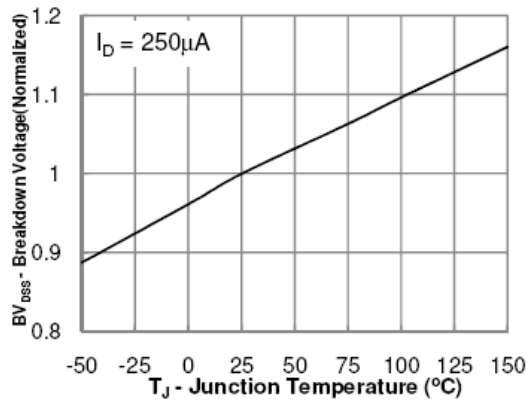


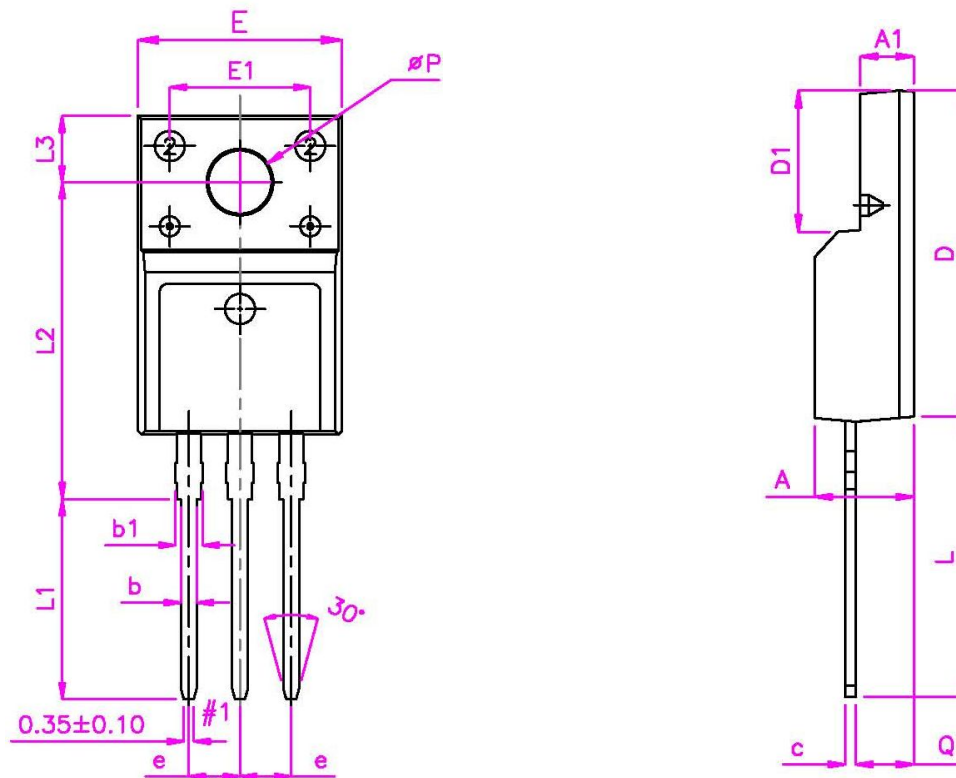
Figure9. Breakdown Voltage Vs Junction

MFIRF7N65
MCIRF7N65

TO-220F Mechanical Data

UNIT.: mm

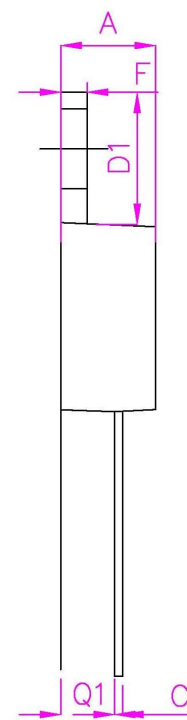
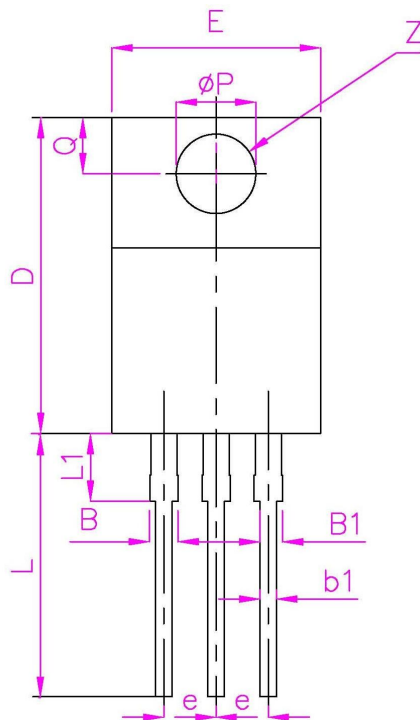
Symbol	MIN.	NOM.	MAX.	Symbol	MIN.	NOM.	MAX.
A	4.2	-	4.70	E1	-	7.0	-
A1	2.30	-	2.90	e	-	2.54	-
b	0.45	-	0.9	L	12.5	-	14.3
b1	1.1	-	1.7	L1	9.45	-	10.05
c	0.35	-	0.9	L2	15	-	16
D	14.5	-	17	L3	3.2	-	4.4
D1	6.10	-	9.0	ΦP	3.0	-	3.3
E	9.6	-	10.3	Q	2.5	-	2.90



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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