HMP065N180C

650-V Cascode GaN HEMT

Description

These GaN HEMT utilize a GaN transistor technologys to provide low RDS(on) and using the Cascode in the TO220 pacakge to realize the normal-off high electron mobility transistor.

Also provides high breakdown voltage, high current and high operating speed which is suitable for high power applications.

Features

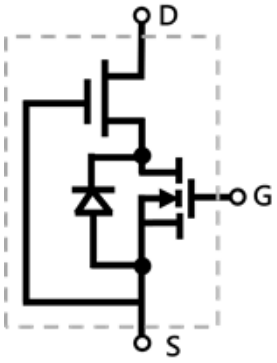
- Gate drive voltage compatibility (-20V to 20V)
- High operating frequency
- Low Q_{rr}

Typical Applications

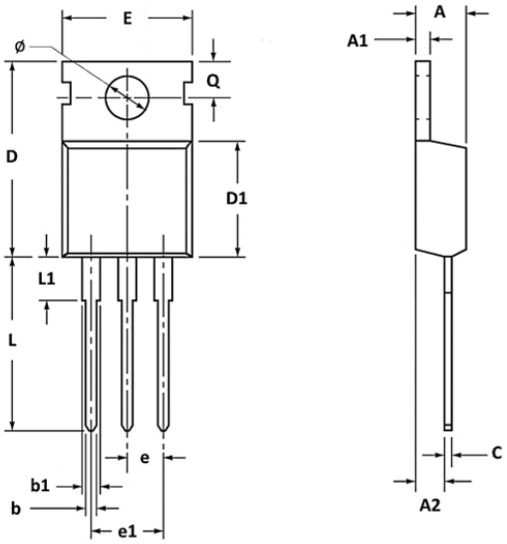
- Switch Mode Power Supplies (SMPS)
- AC-DC/ DC-DC Converters
- Motor Drives

Package type：TO220

Graphic Symbol

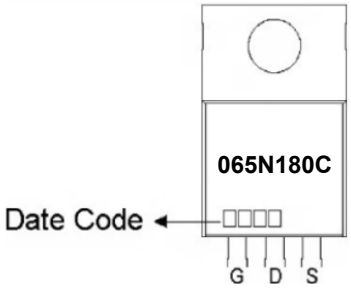


Package Dimension



SYMBOL	DIMENSION (mm)		SYMBOL	DIMENSION (mm)	
	MIN.	MAX.		MIN.	MAX.
A	4.20	4.80	E	9.70	10.40
A1	1.10	1.50	e	2.54(ref.)	
A2	2.20	3.00	e1	5.08(ref.)	
b	0.60	1.00	L	12.70	14.50
b1	1.20	1.80	L1	2.60	4.10
C	0.30	0.65	Φ	3.40	4.00
D	14.30	16.00	Q	2.50	3.00
D1	8.30	9.40			

Marking



RoHS Compliant

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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings			
Symbol	**Parameter**	**Value**	**Units**
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	-20 / +20	V
P_{tot}	Total Power dissipation @T_C =25°C	83	W
I_D	Continuous Drain Current at T_C =25°C	16.1	A
	Continuous Drain Current at T_C =100°C	11.3	A
$I_{D\ pulse}$	Pulse Drain Current (Pulse width =10 μs) [2]	60.4	A
T_J/T_{STG}	Operating Junction and Storage Temperature	-55…150	°C
T_{SOLD}	Soldering peak temperature	260	°C

Notes

1. In off-state, spike duty cycle D<0.01, spike duration <1 μs
2. Value is not tested to full current in production.

Thermal Resistance Ratings			
Symbol	**Parameter**	**Maximum**	**Units**
$R_{\theta JA}$	Maximum Junction-to-Ambient	50	°C/W
$R_{\theta JC}$	Maximum Junction-to-Case	1.5	°C/W

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Static Electrical Characteristics, (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{GS\ (th)}$	Gate Threshold Voltage	V_{DS} =10V, I_D =1mA	-	1.7	3.0	V
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} =0V	650	-	-	V
I_{DSS}	Drain-Source Leakage Current	V_{DS} =650V, V_{GS} =0V, T_J =25°C	-	2.5	30	μA
		V_{DS} =650V, V_{GS} =0V, T_J =150°C	-	10	-	
$R_{DS\ (on)}$	Static Drain-Source On-Resistance	V_{GS} =10V, I_D =5A, T_J =25°C	-	146	180	mΩ
		V_{GS} =10V, I_D =5A, T_J =150°C	-	296	-	
I_{GSS}	Gate-Source Leakage Current	V_{GS} =+/- 20V	-	-	+/-100	nA

AC Electrical Characteristics, (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
C_{ISS}	Input Capacitance	V_{GS}=0 V, V_{DS}=400 V, f=100kHz	-	846	-	pF
C_{OSS}	Output Capacitance		-	23.2	-	
C_{RSS}	Reverse Transfer Capacitance		-	4.2	-	
Q_g	Total Gate Charge	V_{DS} = 400V, V_{GS} = 0 to 10V, I_{DS}=5A	-	8.3	-	nC
Q_{GS}	Gate-Source Charge		-	2.7	-	
Q_{OSS}	Output Charge	V_{GS}=0V, V_{DS}=0~400V	-	33	-	
Q_{RR}	Reverse Recovery Charge	I_S=5V, V_{DS}=0V	-	48	-	
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 400 V, V_{GS} = 0 to 10V, I_{DS} = 2A, R_G(on) = 25 Ω,	-	10	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	20	-	
P_D	Maximum power dissipation	Tc =25°C	-	83	-	W

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- **Typical Electrical Characteristics**

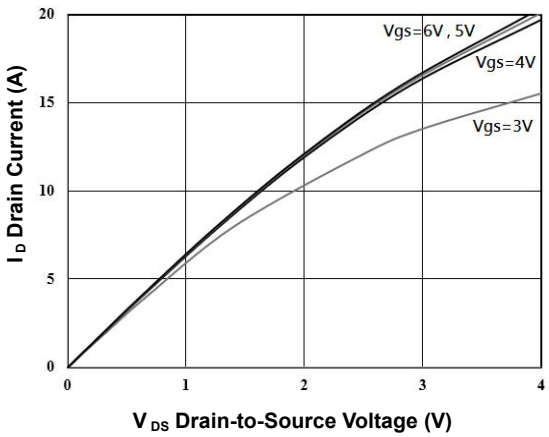

FIG.1-Output Characteristics T_J=25°C

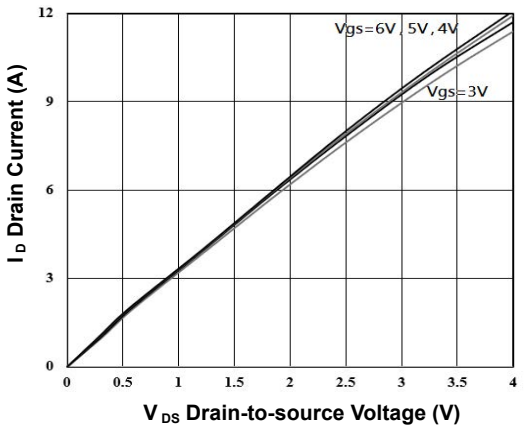

FIG.2- Output Characteristics T_J=150°C

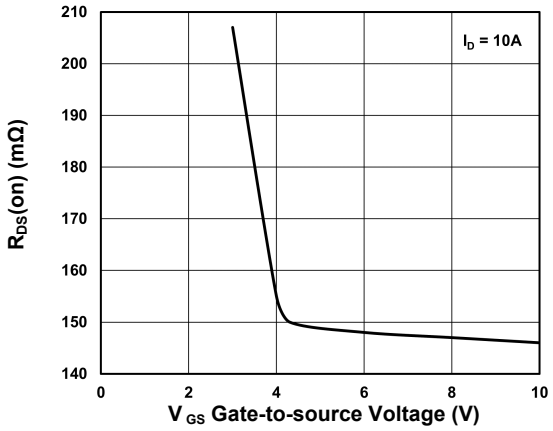

FIG.3- Resistance vs V_{GS}

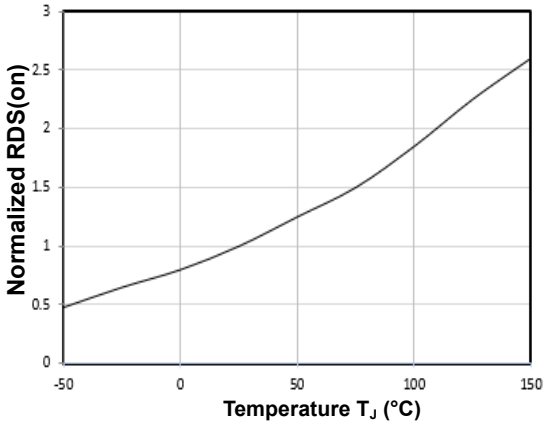

FIG.4- Normalized RDS(on) vs. Temperature

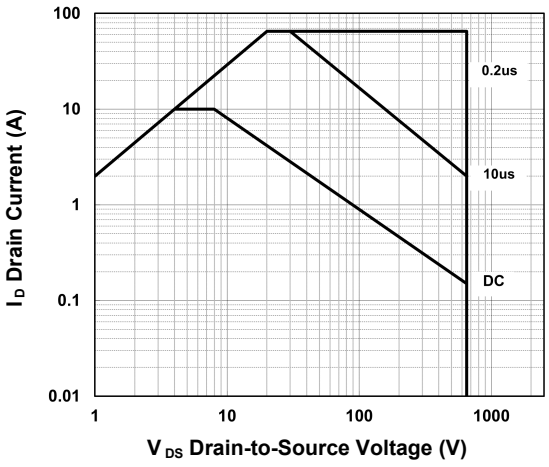

FIG.5- Safe Operating Area

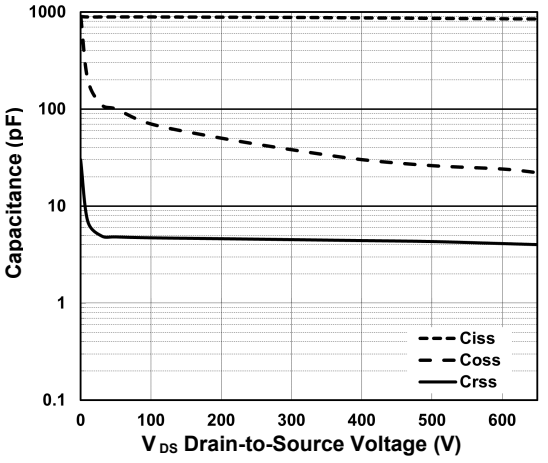

FIG.6- Capacitance vs Drain-Source Voltage

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- **Typical Electrical Characteristics**

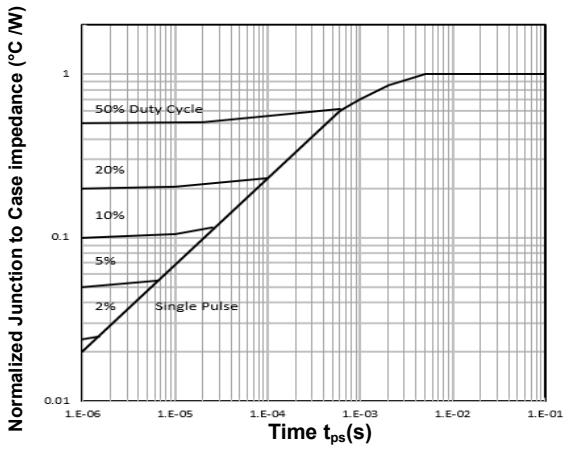

FIG.7- Transient Thermal impedance (Junction to Case)

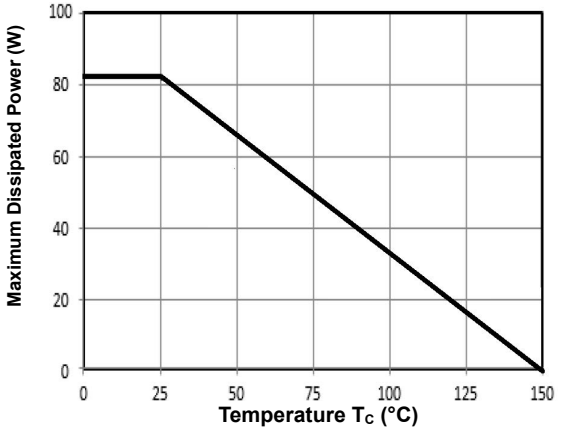

FIG.8- Maximum Power Dissipation Derating vs Case Temperature

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