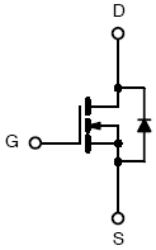
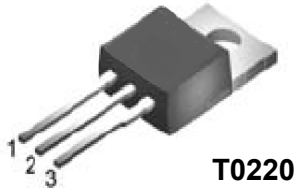
PMG20N65P N-Channel Enhancement Mode MOSFET

Product Summary			
I_D	T_A=25°C	20A	Max
$V_{(BR)DSS}$	I_D=250uA	650V	Min
$r_{DS(on)}$	V_{GS}=10V	0.17 Ω	Typ

Features

- Low $r_{DS(on)}$
- Ultra Low Gate Charge
- High dV/dt capability
- High Unclamped Inductive Switching (UIS) capability
- High peak current capability
- Increased transconductance performance
- Optimized design for high performance power systems





T0220

Standard Metal Heatsink

1=Gate, 2=Drain, 3=Source.

Maximum Ratings and Thermal Characteristics [b] (T_A=25°C unless otherwise noted)			
Parameter	**Symbol**	**Limit**	**Unit**
Drain-Source Voltage	VDS	650	V
Gate-Source Voltage (Static)	VGS	±20	
Gate-Source Voltage AC (f > 1Hz)	VGS	±30	
Drain Current - Continuous (Tc = 25° C)	ID	20	A
- Pulsed (limited by Tjmax)	IDM	82	
Repetitive Avalanche Current (limited by Tjmax)	IAR	7	A
Energy in Avalanche (single pulse, ID = 3.5A)	EAS	690	mJ
Maximum Power Dissipation (Tc = 25° C)	PD	208	W
Operating Junction and Storage Temperature Range	TJ, Tstg	-55 to 150	oC
dV/dt voltage slope (Vds=480V, ID=20A, Tj = 125 °C	dV/dt	50	V/ns
Thermal Resistance - Junction-to-Ambient	RthJA	72	oC/W
- Junction-to-Case	RthJC	0.6	oC/W

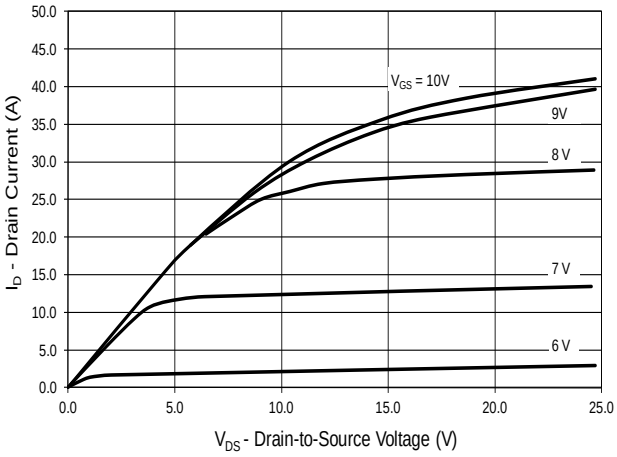
a When mounted on 1 inch square 2oz copper clad FR-4

b Preliminary Data Sheet - Specifications subject to change.

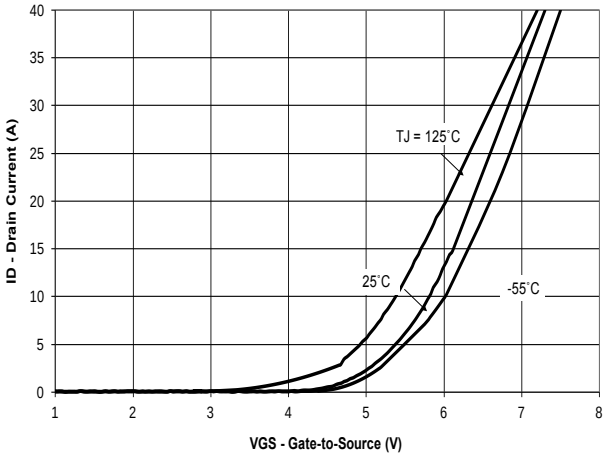
Electrical Characteristics[b] (TJ=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	650	675		V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=600V, V_{GS}=0V		0.1	1	μA
		TJ = 150°C		20	100	μA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V		10	100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2.5	3	3.5	V
$r_{DS(on)}$	Drain-to-Source On-State Resistance	V_{GS}=10V, I_D=10A	0.139	0.17	0.199	Ω
		TJ = 150°C	0.33	0.4	0.597	Ω
R_G	Gate Resistance	f = 1MHz,	0.2	0.5	0.7	Ω
g_{fs}	Transconductance	V_{DS}> 2*I_D*R_{DS} , I_D = 10A	13	20	30	S
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	900	2400	2700	pF
C_{oss}	Output Capacitance		600	780	820	pF
C_{rss}	Reverse Transfer Capacitance		20	50	70	pF
$t_{d(on)}$	Turn-On Delay Time	V_{GS}=10V, I_D=20A, V_{DS}=380V R_G = 4Ω (External)	5	10	12	nS
t_r	Rise Time		2	5	7	nS
$t_{d(off)}$	Turn-Off Delay Time		30	67	100	nS
t_f	Fall Time		2	4.5	12	nS
Q_g	Total Gate Charge	V_{GS}=10V, I_D=20A, V_{DS}=480V	65	87	114	nC
Q_{gs}	Gate-to-Source Charge		6	11	13	nC
Q_{gd}	Gate-to-Drain Charge		23	33	36	nC
$V_{(plateau)}$	Gate Plateau voltage		2	5.5	7	V
t_{rr}	Source-to-Drain Reverse Recovery Time	I_S=I_F, di/dt=100A/uS, Vrr=480V	100	200	250	nS
Qrr	Reverse recovery charge		7	11	14	μC
Irm	Peak reverse recovery current		30	70	80	A
V_{SD}	Diode Forward Voltage	I_S=IF, V_{GS}=0V	0.5	1.0	1.2	V

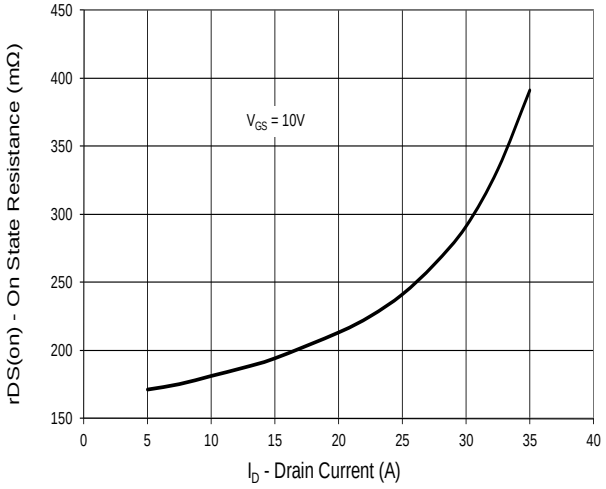
Output Characteristics



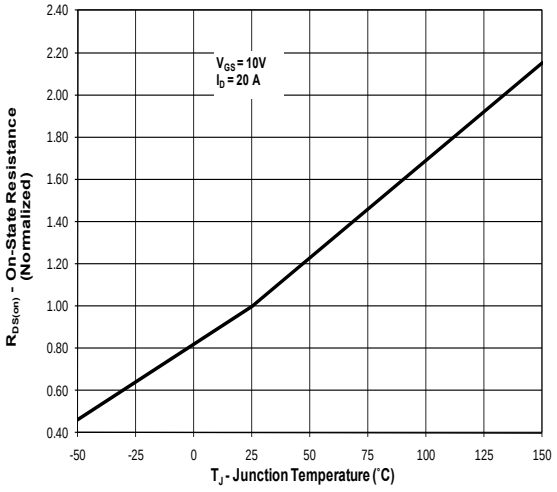
Transfer Characteristics



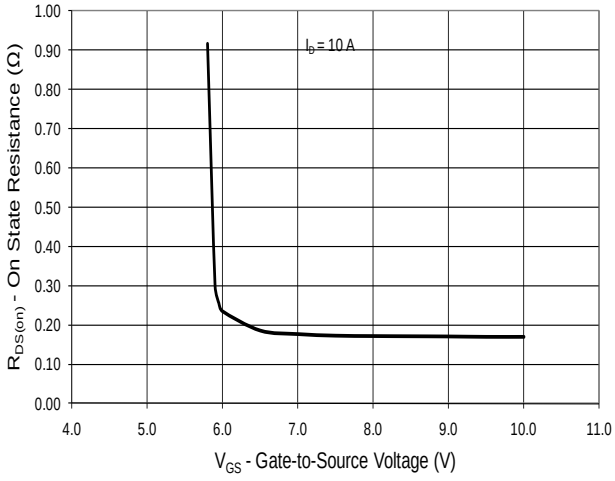
On State Resistance vs. Drain Current



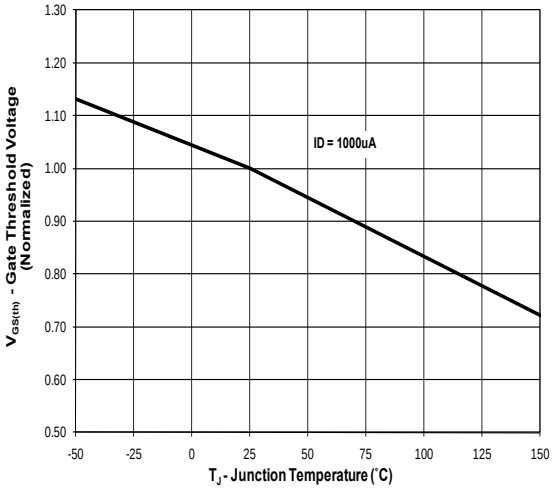
On-State Resistance vs. Junction Temperature



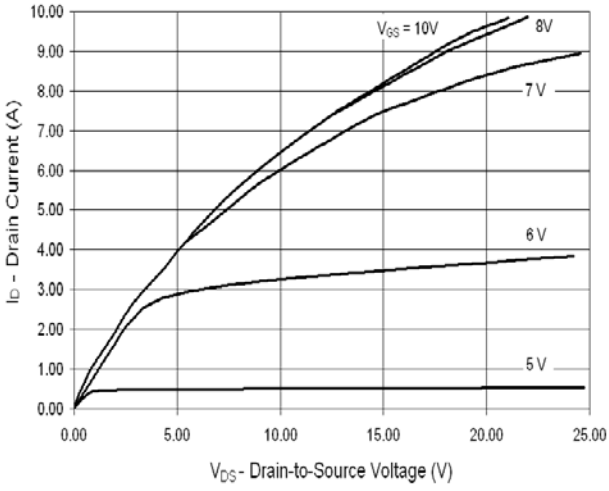
On-Resistance vs. Gate-to-Source Voltage



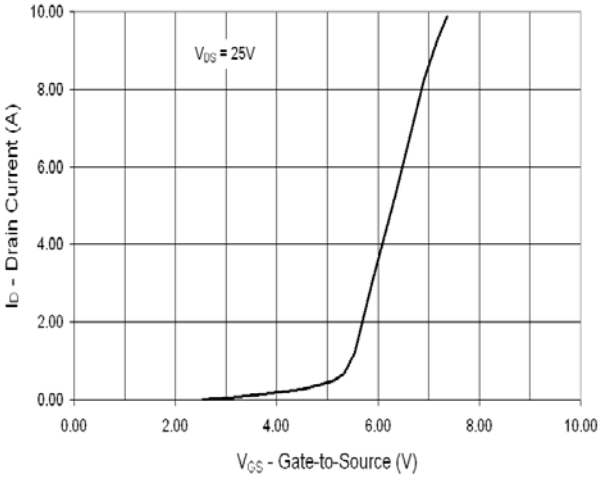
Gate Threshold Voltage vs. Junction Temperature



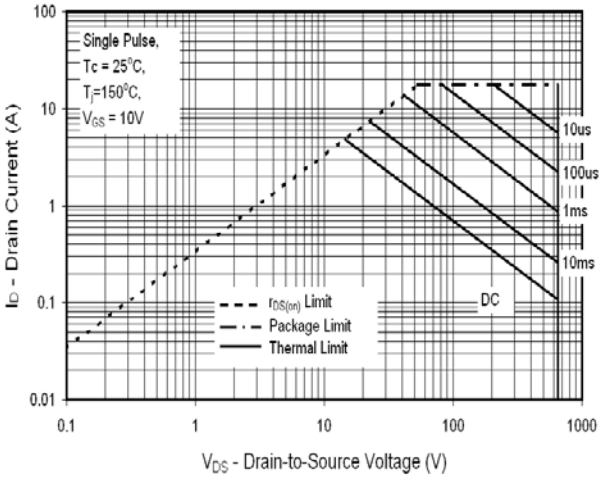
Output Characteristics



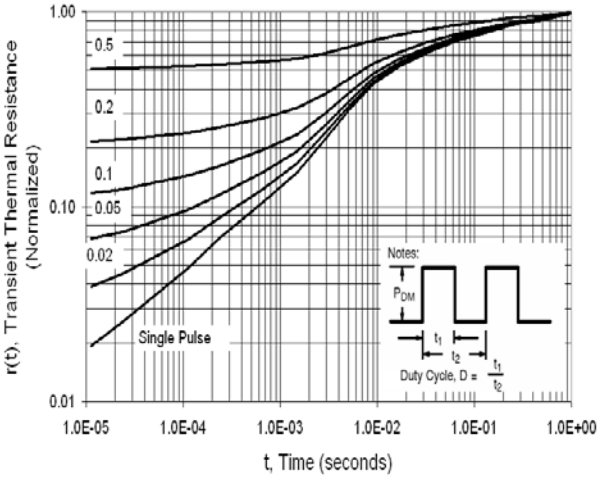
Transfer Characteristics

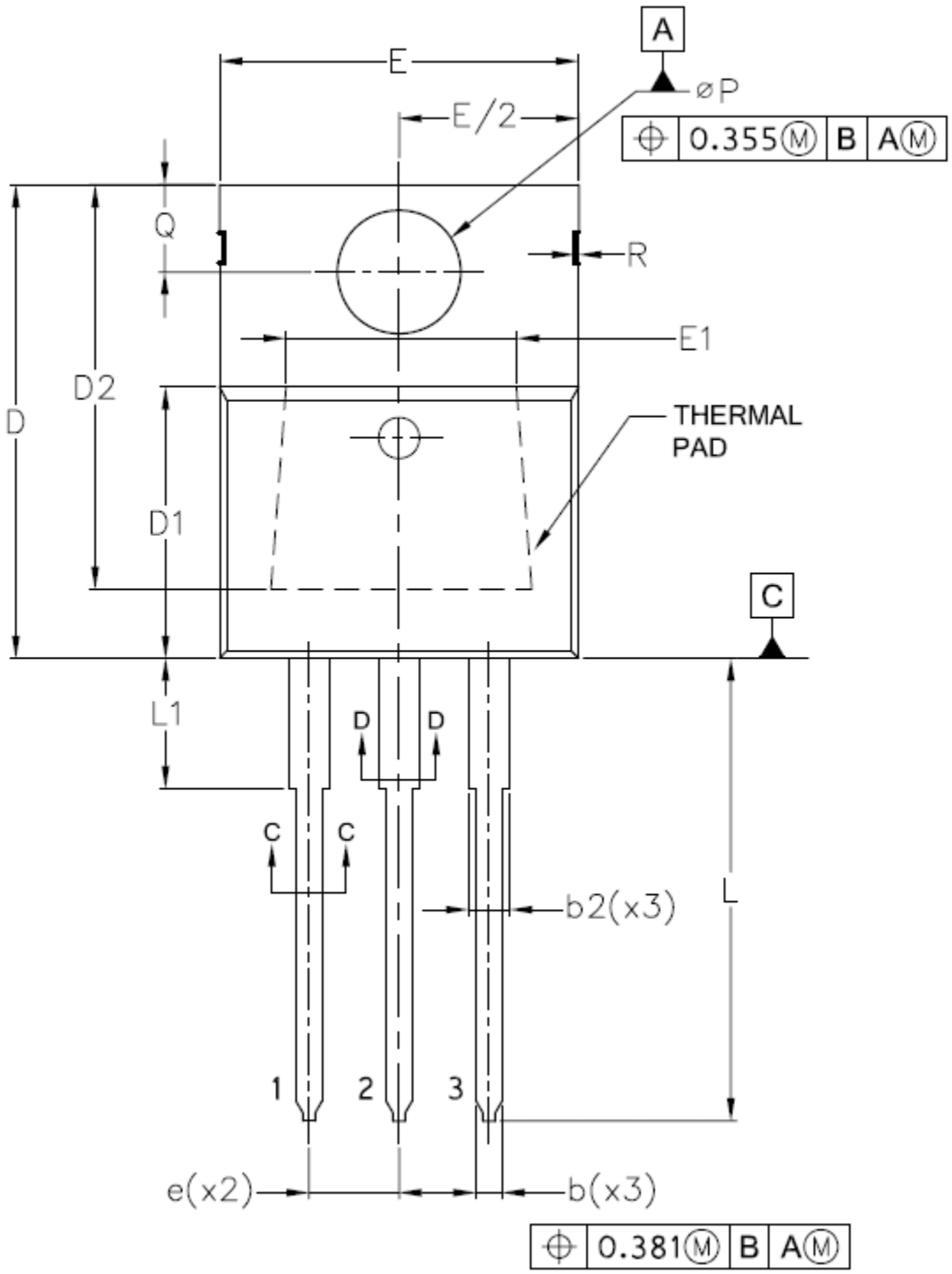


Maximum Rated Forward Biased Safe Operating Area



Transient Thermal Response, Junction-to-Case




A
E
E/2
øP
0.355 M B A M
Q
R
E1
D2
D
D1
THERMAL
PAD
C
L1
D
D
C
C
b2(x3)
L
1
2
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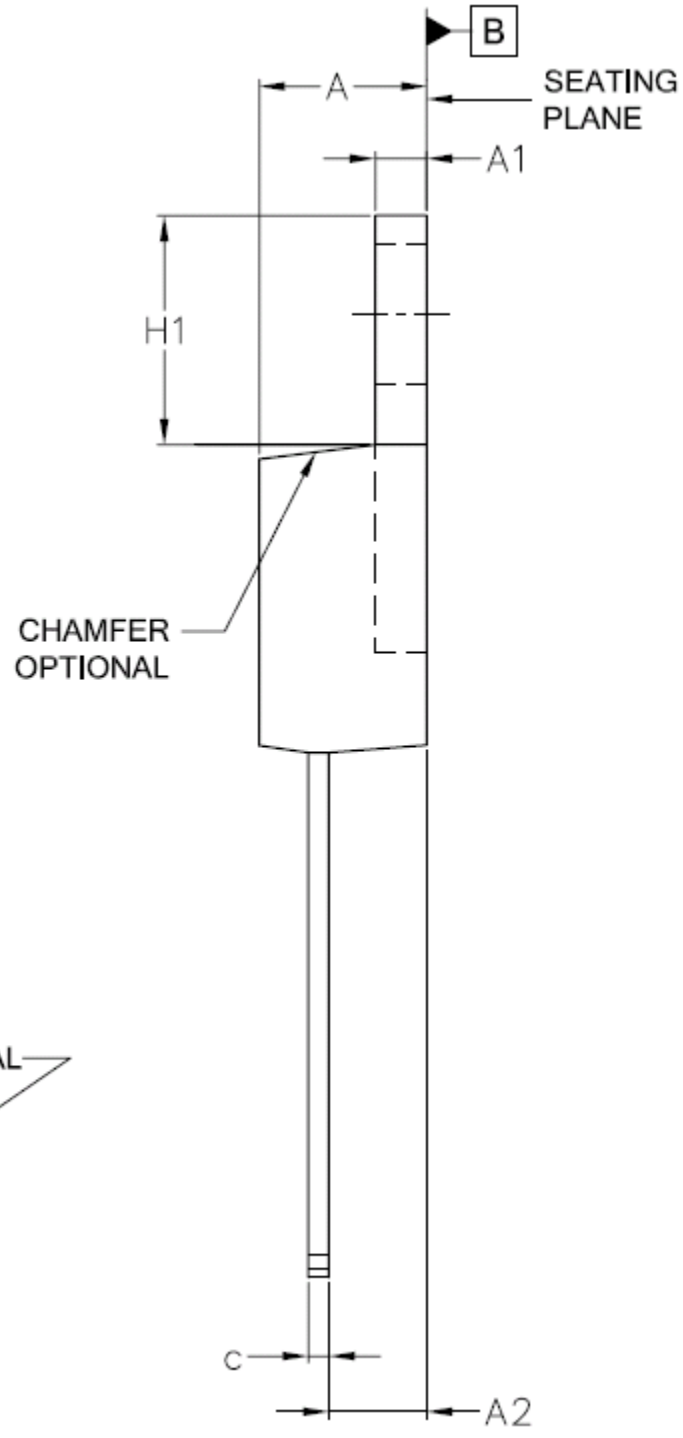
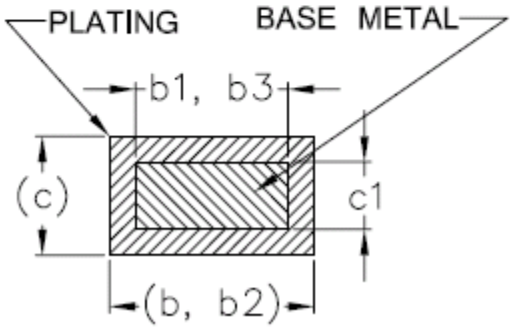
e(x2)
b(x3)
0.381 M B A M





SECTION C-C & D-D

SYMBOLS	DIMENSIONS			
	mm		Inch	
	MIN.	MAX.	MIN.	MAX.
A	3.556	4.826	0.140	0.190
A1	0.508	1.397	0.020	0.055
A2	2.032	2.921	0.080	0.115
b	0.381	1.016	0.015	0.040
b1	0.381	0.965	0.015	0.038
c	0.356	0.610	0.014	0.024
c1	0.356	0.559	0.014	0.022
D	14.224	16.510	0.560	0.650
D1	8.382	9.017	0.330	0.355
D2	12.192	12.878	0.480	0.507
E	9.652	10.668	0.380	0.420
E1	6.858	8.890	0.270	0.350
e	2.540 BSC		0.100 BSC	
H1	5.842	6.858	0.230	0.270
L	12.700	14.732	0.500	0.580
⌀P	3.810	3.860	0.150	0.151
Q	2.540	3.048	0.100	0.120
b2	1.143	1.778	0.045	0.070
R	1.270 BSC		0.050 BSC	
L1	–	6.350	–	0.250
b3	1.143	1.727	0.045	0.068
f1	3.200 REF.		0.126 REF.	
f2	4.220 REF.		0.166 REF.	
j	1.750 REF.		0.069 REF.	
r	0.510 REF.		0.020 REF.	
N	TO-220-3L			