

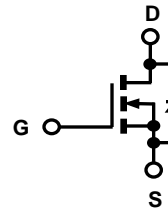


PMG60N160G N-Channel Enhancement Mode MOSFET

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

Product Summary			
I_D	$T_A=25^\circ\text{C}$	23.8A	Max
$V_{(BR)DSS}$	$I_D=250\mu\text{A}$	650V	Min
$r_{DS(on)}$	$V_{GS}=10\text{V}$	0.14 Ω	Typ
Q_g	$V_{DS}=480\text{V}$	85nC	Typ



T0263

Standard Metal
Heatsink

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

Maximum ratings^b, at $T_j=25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$T_c=25^\circ\text{C}$	23.8	A
Pulsed drain current	$I_{D, pulse}$	$T_c=25^\circ\text{C}$	82	A
Avalanche energy, single pulse	E_{AS}	$I_D=11.9\text{A}$	690	mJ
Avalanche current, repetitive	I_{AR}	limited by $T_j\text{max}$	13	A
MOSFET dv/dt ruggedness	dv/dt	$V_{DS}=480\text{V}$, $I_D=23.8\text{A}$, $T_j=125^\circ\text{C}$	50.0	V/ns
Gate source voltage	V_{GS}	Static	± 20	V
		AC ($f > 1\text{Hz}$), $V_{GS}=30\text{V}$	± 30	
Power dissipation	P_{tot}	$T_c=25^\circ\text{C}$	208	W
Operating and storage temperature	T_j, T_{stg}		-55 to +150	$^\circ\text{C}$
Mounting torque		M 3 & 3.5 screws	60	Ncm

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

b Preliminary Data Sheet – Specifications subject to change

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

Thermal characteristics

Thermal resistance, junction-case ^a	R_{thJC}		-	-	1.9	°C/W
Thermal resistance, junction-ambient ^a	R_{thJA}	leaded	-	-	68	
Soldering temperature, wave soldering only allowed at leads	T_{sold}	1.6mm (0.063in.) from case for 10 s	-	-	260	°C

Electrical characteristics ^b, at $T_j=25^\circ\text{C}$, unless otherwise specified

Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=250\mu\text{A}$	650	675	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.5	3	3.5	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=600\text{V}, V_{GS}=0\text{V}, T_j=25^\circ\text{C}$	-	0.1	1	μA
		$V_{DS}=600\text{V}, V_{GS}=0\text{V}, T_j=150^\circ\text{C}$	-	20	100	
Gate source leakage current	I_{GSS}	$V_{GS}=\pm 20\text{ V}, V_{DS}=0\text{V}$	-	10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=11.9\text{A}, T_j=25^\circ\text{C}$	-	0.14	0.16	Ω
		$V_{GS}=10\text{V}, I_D=11.9\text{A}, T_j=150^\circ\text{C}$	-	0.35	-	
Gate resistance	R_G	$f=1\text{ MHz}, \text{open drain}$	-	4	-	Ω

Dynamic characteristics

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=25\text{ V}, f=1\text{ MHz}$	-	2730	-	μF
Output capacitance	C_{oss}		-	1330	-	
Reverse transfer capacitance	C_{rss}		-	17	-	
Transconductance	g_{fs}	$V_{DS}>2 * I_D * R_{DS}, I_D=11.9\text{A}$	-	25	-	S
Turn-on delay time	$t_{d(on)}$	$V_{DS}=480\text{V}, V_{GS}=10\text{V}, I_D=23.8\text{A}, R_G=4\Omega$ (External)	-	10	-	ns
Rise time	t_r		-	5	-	
Turn-off delay time	$t_{d(off)}$		-	67	-	
Fall time	t_f		-	25	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

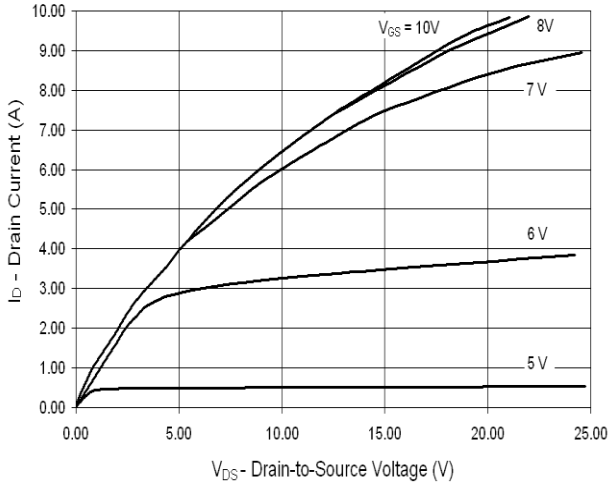
Gate charge characteristics

Gate to source charge	Q_{gs}	$V_{DS}=480\text{ V}, I_D=23.8\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	16	-	nC
Gate to drain charge	Q_{gd}		-	34	-	
Gate charge total	Q_g		-	85	-	
Gate plateau voltage	V_{plateau}		-	6	-	V

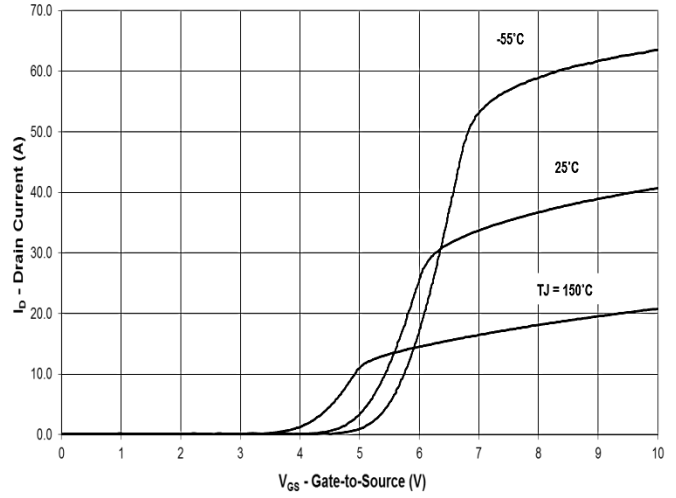
Reverse Diode

Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_S=I_F$	-	1.0	1.2	V
Reverse recovery time	t_{rr}	$V_{RR}=480\text{ V}, I_S=I_F,$ $d_{iF}/d_t=100\text{ A}/\mu\text{S}$	-	440	-	ns
Reverse recovery charge	Q_{rr}		-	8	-	μC
Peak reverse recovery current	I_{rm}		-	35	-	A

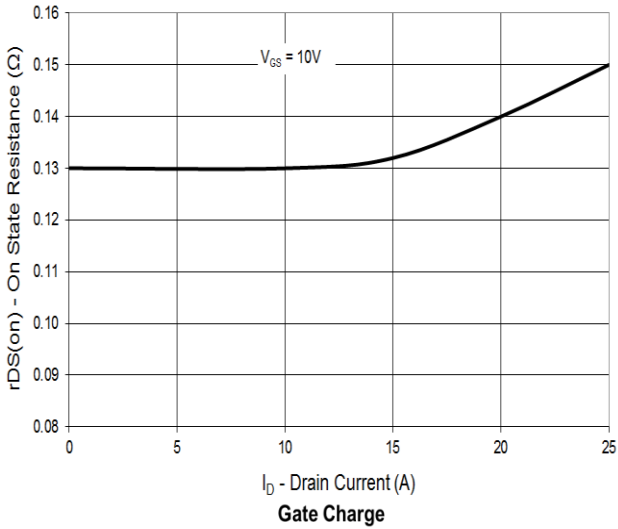
Output Characteristics



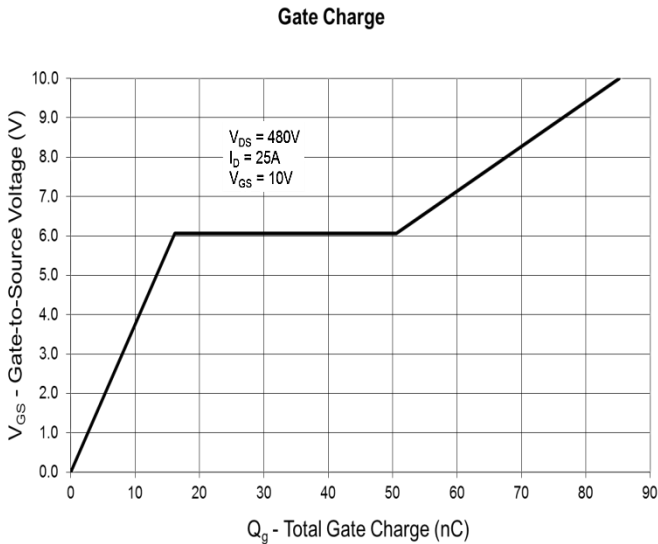
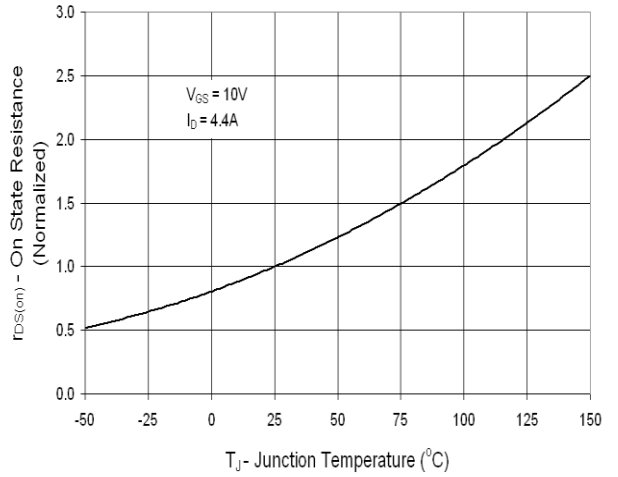
Transfer Characteristics



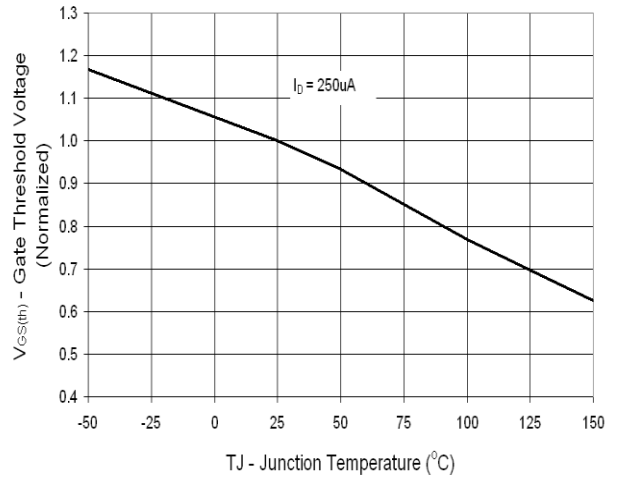
On State Resistance vs. Drain Current



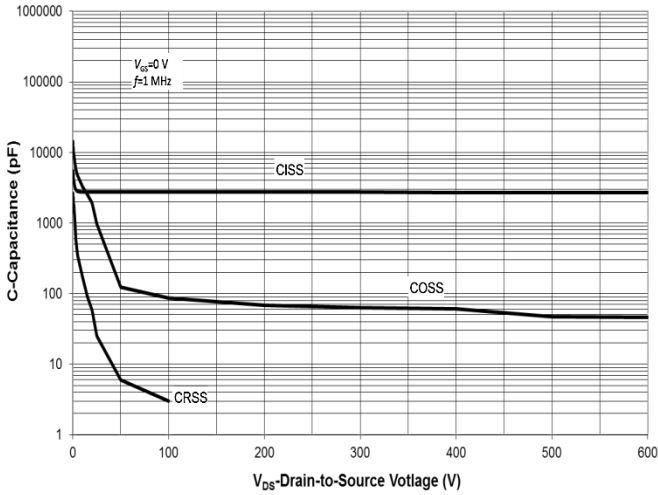
On State Resistance vs. Junction Temperature



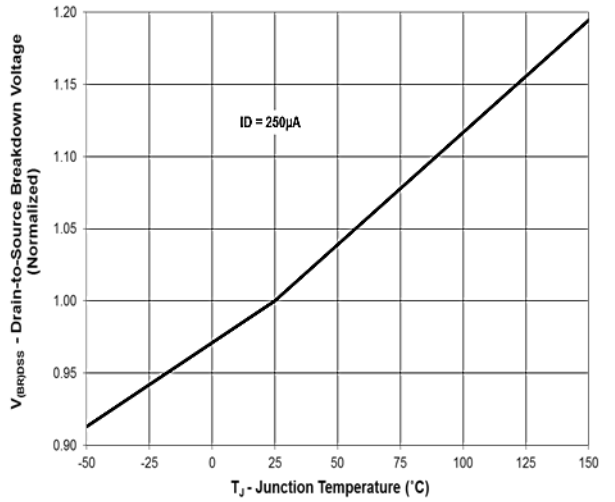
Gate Threshold Voltage vs. Junction Temperature



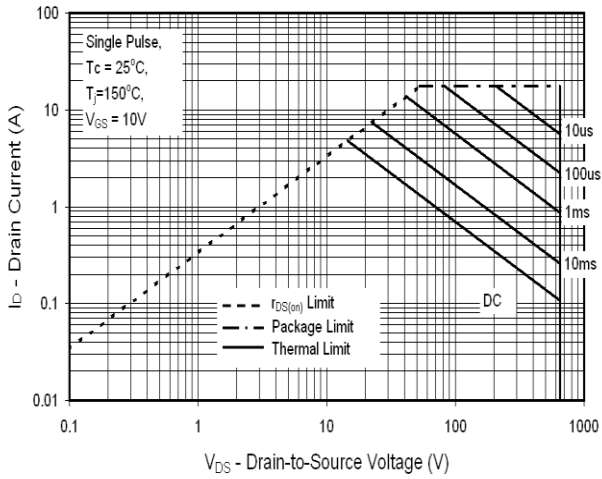
Capacitance



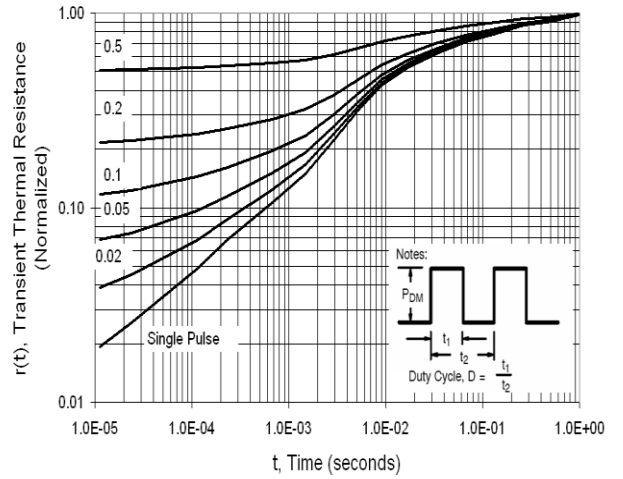
Drain-to-Source Breakdown Voltage vs. Junction Temperature

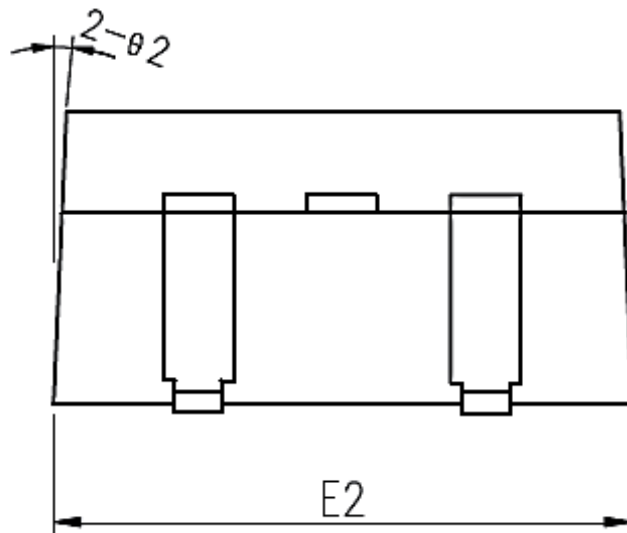
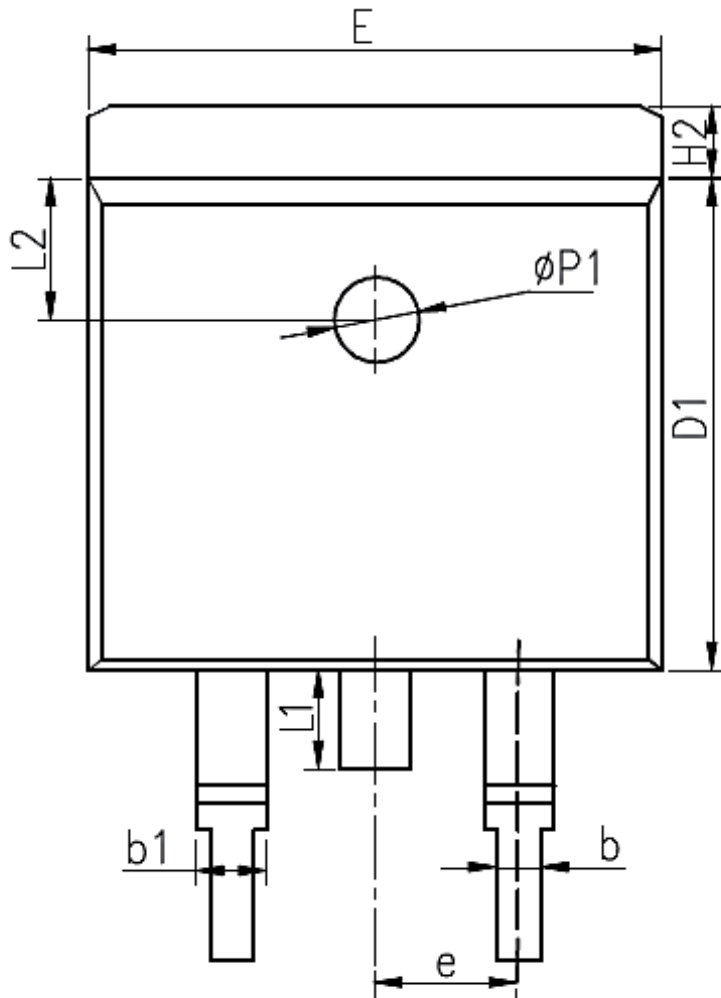


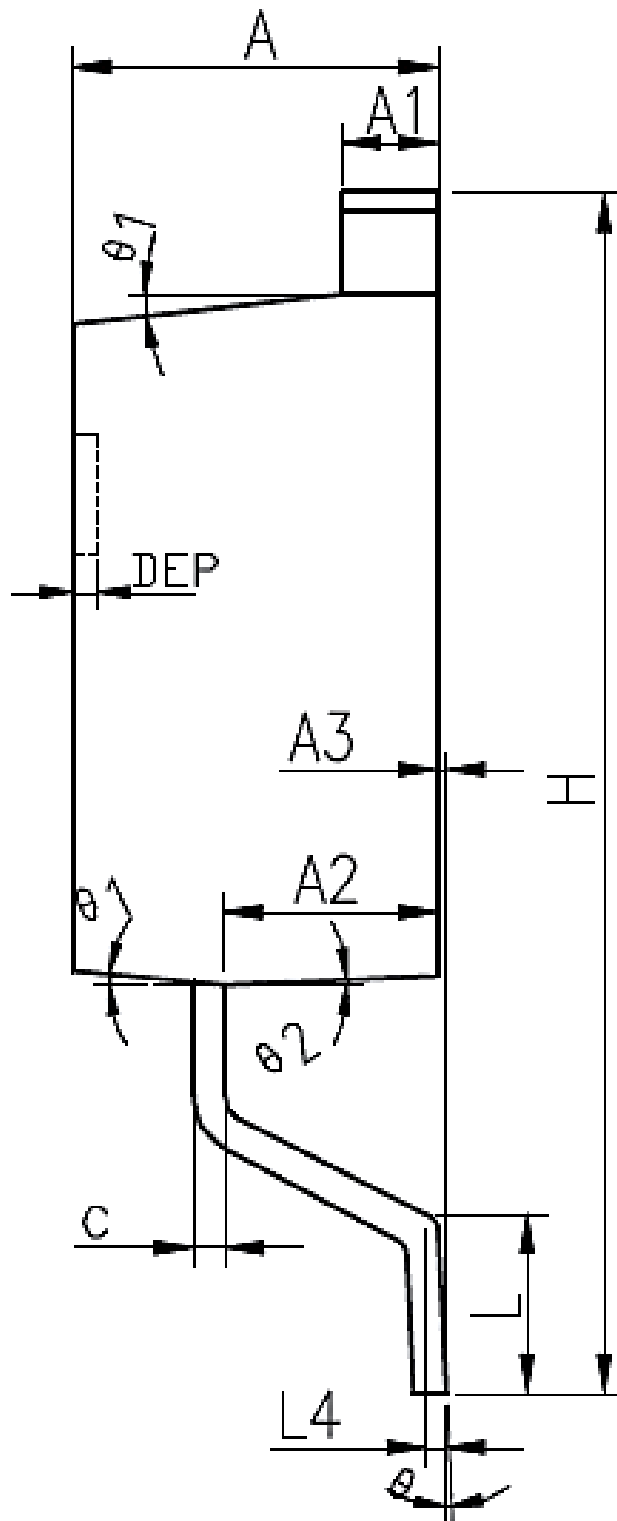
Maximum Rated Forward Biased Safe Operating Area



Transient Thermal Response, Junction-to-Case







COMMON DIMENSIONS

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.22	1.27	1.32	0.048	0.050	0.052
A2	2.59	2.69	2.79	0.102	0.106	0.110
A3	0.00	0.10	0.20	0.000	0.004	0.008
b	0.77	0.813	0.90	0.030	0.032	0.035
b1	1.20	1.270	1.36	0.047	0.050	0.054
c	0.34	0.381	0.47	0.013	0.015	0.019
D1	8.60	8.70	8.80	0.339	0.343	0.346
E	10.00	10.16	10.26	0.394	0.400	0.404
E2	10.00	10.10	10.20	0.394	0.398	0.402
e	2.54 BSC			0.100 BSC		
H	14.70	15.10	15.50	0.579	0.594	0.610
H2	1.17	1.27	1.40	0.046	0.050	0.055
L	2.00	2.30	2.60	0.079	0.091	0.102
L1	1.45	1.55	1.70	0.057	0.061	0.067
L2	2.50 REF			0.098 REF		
L4	0.25 BSC			0.010 BSC		
θ	0°	5°	8°	0°	5°	8°
θ1	5°	7°	9°	5°	7°	9°
θ2	1°	3°	5°	1°	3°	5°
φP1	1.40	1.50	1.60	0.055	0.059	0.063
DEP	0.05	0.10	0.20	0.002	0.004	0.008