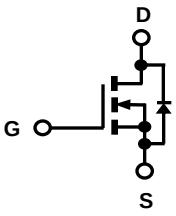
PMG10N65F N-Channel Enhancement Mode MOSFET

Product Summary			
I_D	T_A=25°C	9.5A	Max
$V_{(BR)DSS}$	I_D=250uA	650V	Min
$r_{DS(on)}$	V_{GS}=10V	0.35	Typ
Q_g	V_{DS}=480V	41nC	Typ

Features

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



T0220 Full-PAK

Isolated (T0-220)

1=Gate, 2=Drain, 3=Source

Maximum ratings [b] , at T_j=25°C, unless otherwise specified

Parameter	*Symbol*	*Conditions*	*Value*	*Unit*
Continuous drain current	I_D	T_c=25°C	9.5	A
Pulsed drain current	$I_{D, pulse}$	T_c=25°C	28.5	A
Avalanche energy, single pulse	E_{AS}	I_D=8.3A	340	mJ
Avalanche current, repetitive	I_{AR}	limited by $T_j$max	5	A
MOSFET d*v*/d*t* ruggedness	d*v*/d*t*	V_{DS}=480V, I_D=9.5A, T_j=125°C	50	V/ns
Gate source voltage	V_{GS}	static	±20	V
		AC (*f*>1Hz)	±30	
Power dissipation	P_{tot}	T_c=25°C	35	W
Operating and storage temperature	T_j, T_{stg}		-55 to +150	°C
Mounting torque		M 2.5 screws	50	Ncm

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

b Preliminary Data Sheet – Specifications subject to change

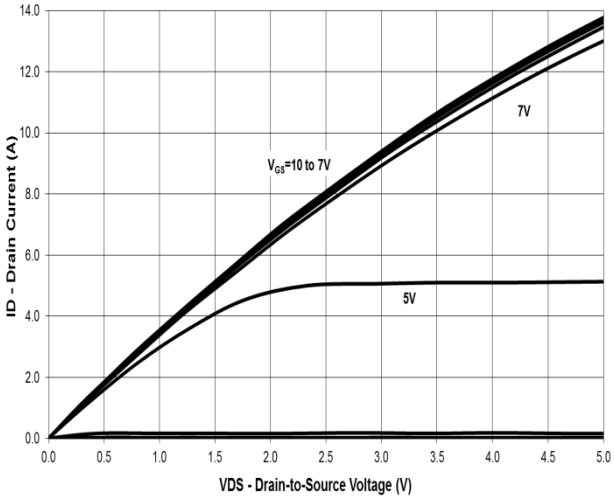
Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	
Thermal characteristics						
Thermal resistance, junction-case [a]	R_{thJC}		-	-	3.5	°C/W
Thermal resistance, junction-ambient [a]	R_{thJA}	leaded	-	-	80	
Soldering temperature, wave soldering only allowed at leads	T_{sold}	1.6mm (0.063in.) from case for 10 s	-	-	260	°C

Electrical characteristics [b], at T_j=25°C, unless otherwise specified

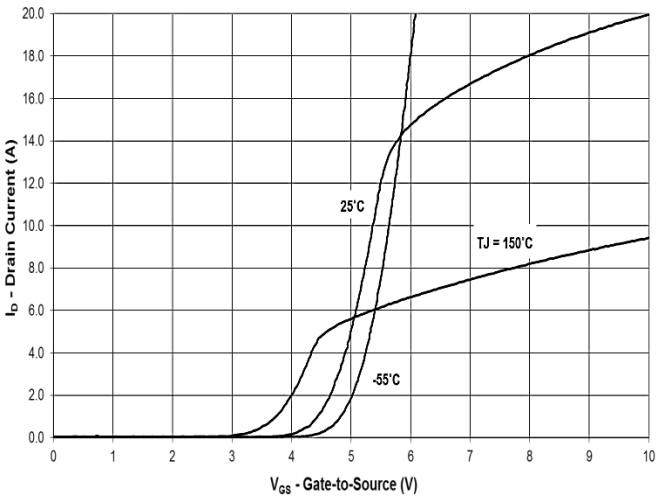
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=250μA	650	675	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.1	3	3.9	
Zero gate voltage drain current	I_{DSS}	V_{DS}=650V, V_{GS}=0V, T_j=25°C	-	0.1	1	μA
		V_{DS}=650V, V_{GS}=0V, T_j=150°C	-	-	100	
Gate source leakage current	I_{GSS}	V_{GS}=±20 V, V_{DS}=0V	-	-	100	nA
Drain-source on-state resistance	$R_{DS\ (on)}$	V_{GS}=10V, I_D=4.75A, T_j=25°C	-	0.35	0.38	Ω
		V_{GS}=10V, I_D=4.75A, T_j=150°C	-	0.63	-	
Gate resistance	R_G	f=1 MHZ, open drain	-	5	-	Ω
Dynamic characteristics						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=25 V, f=1 MHz	-	1250	-	pF
Output capacitance	C_{oss}		-	600	-	
Reverse transfer capacitance	C_{rss}		-	5	-	
Transconductance	g_{fs}	V_{DS}>2*I_D*R_{DS}, I_D=4.75A	-	12	-	S
Turn-on delay time	$t_{d(on)}$	V_{DS}=380V, V_{GS}=10V, I_D=9.5A, R_G=4Ω (External)	-	6	-	ns
Rise time	t_r		-	3.5	-	
Turn-off delay time	$t_{d(off)}$		-	54	-	
Fall time	t_f		-	7	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DS}=480 V, I_D=9.5A, V_{GS}=0 to 10 V	-	7.1	-	nC
Gate to drain charge	Q_{gd}		-	14.5	-	
Gate charge total	Q_g		-	41	-	
Gate plateau voltage	$V_{plateau}$		-	5.2	-	V
Reverse Diode						
Diode forward voltage	V_{SD}	V_{GS}=0V, I_S=I_F	-	0.9	1.2	V
Reverse recovery time	t_{rr}	V_{RR}=300V, I_S=I_F, d_{iF}/d_t=100 A/µS	-	332	-	ns
Reverse recovery charge	Q_{rr}		-	4.4	-	µC
Peak reverse recovery current	I_{rm}		-	25.6	-	A

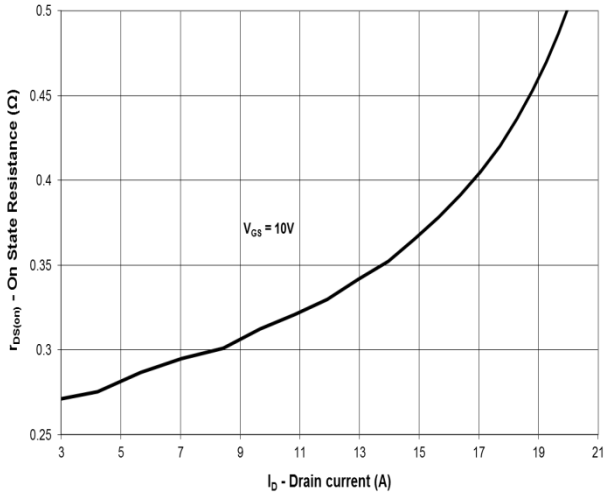
Output Characteristics



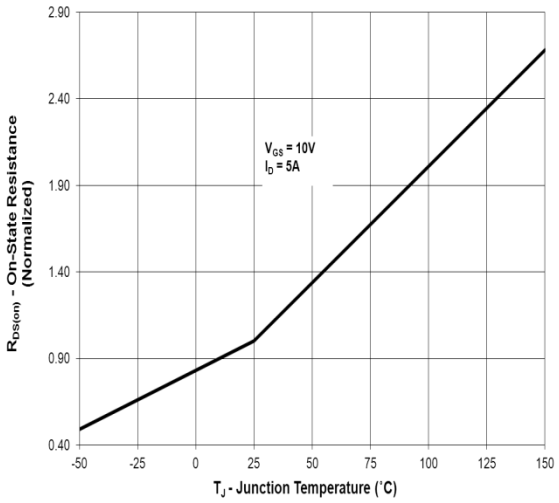
Transfer Characteristics



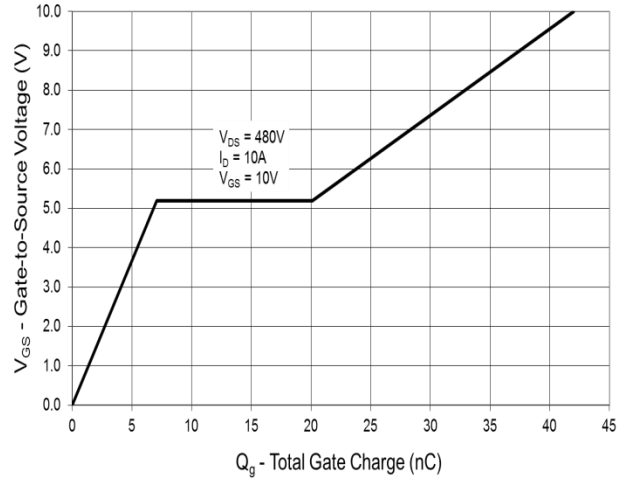
On Resistance vs. Drain Current



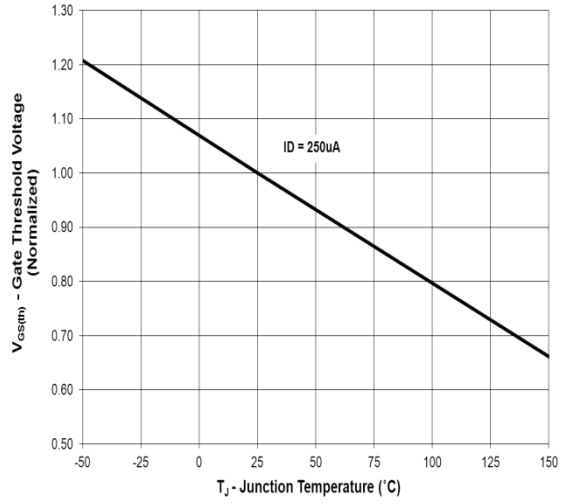
On-State Resistance vs. Junction Temperature



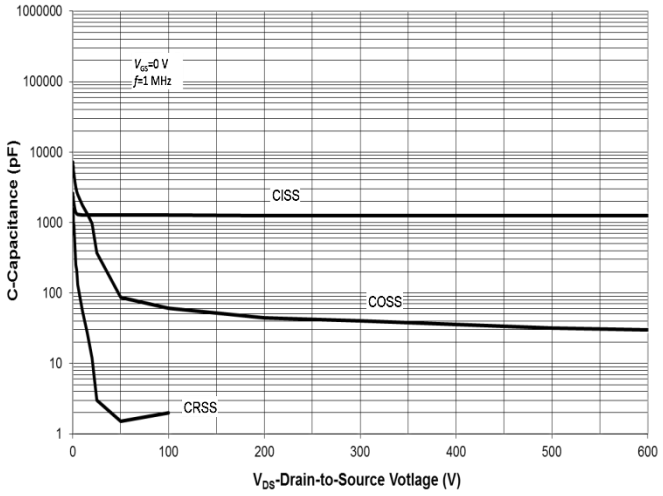
Gate Charge



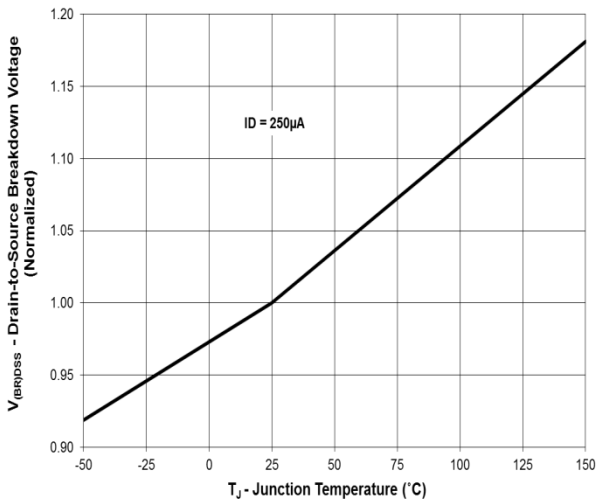
Gate Threshold Voltage vs. Junction Temperature



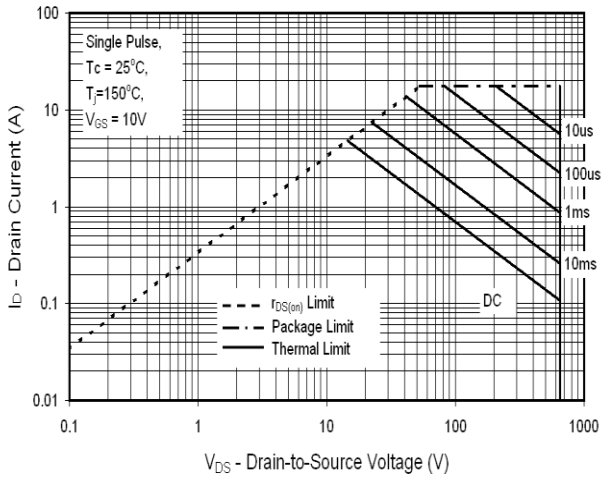
Capacitance



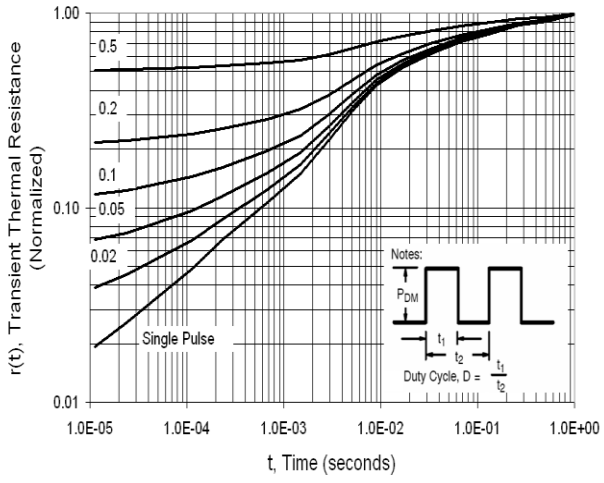
Drain-to-Source Breakdown Voltage vs. Junction Temperature

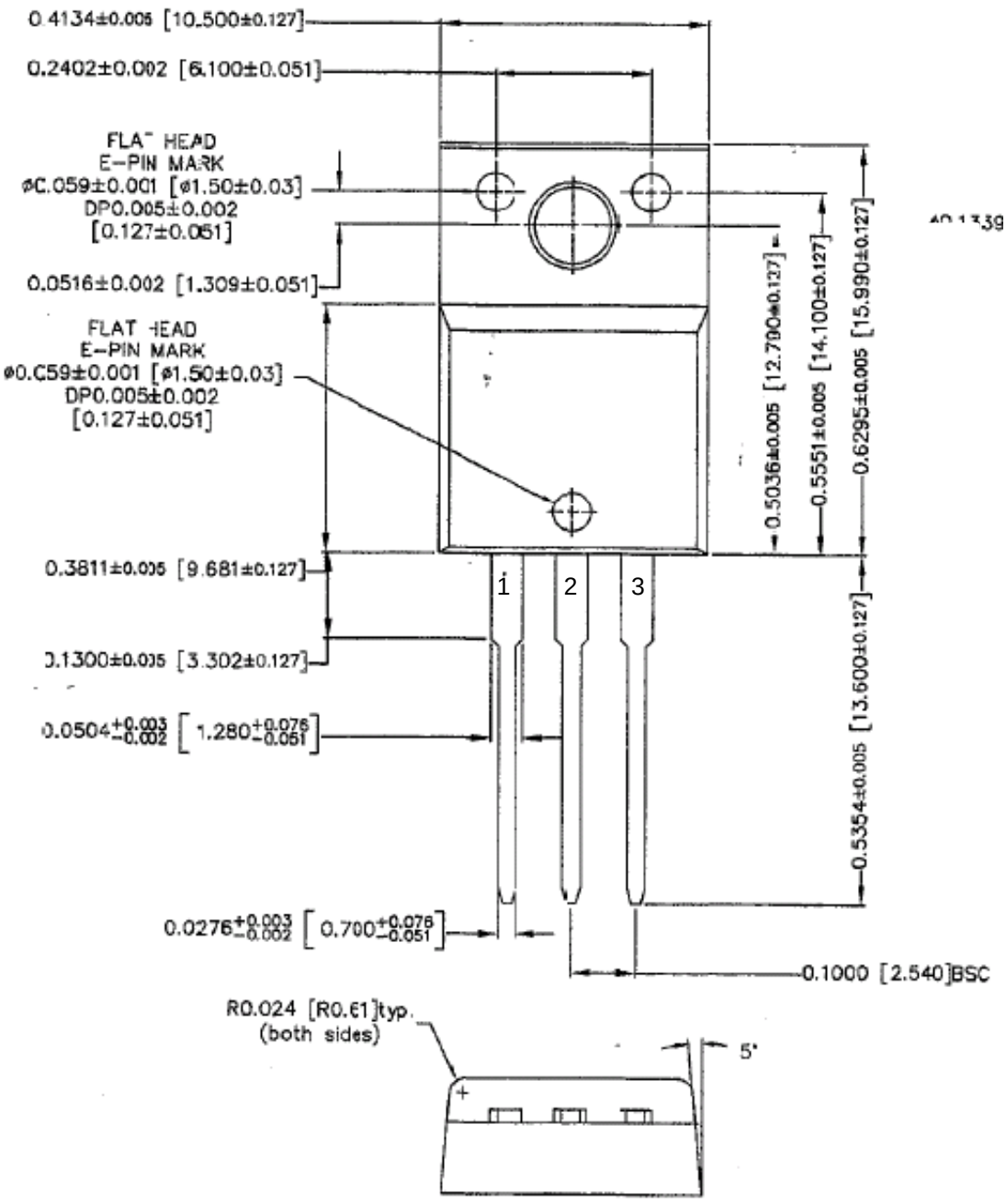


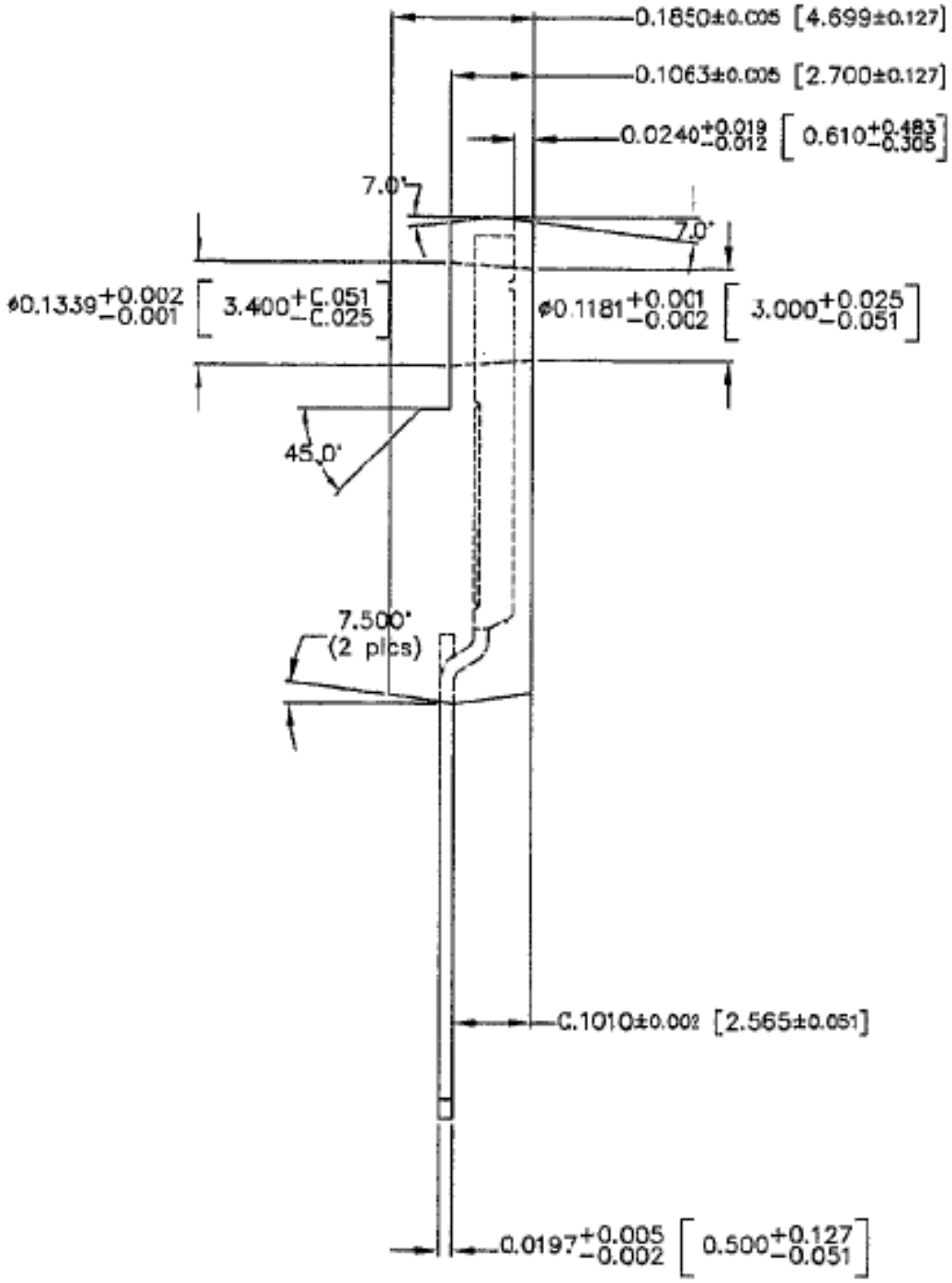
Maximum Rated Forward Biased Safe Operating Area

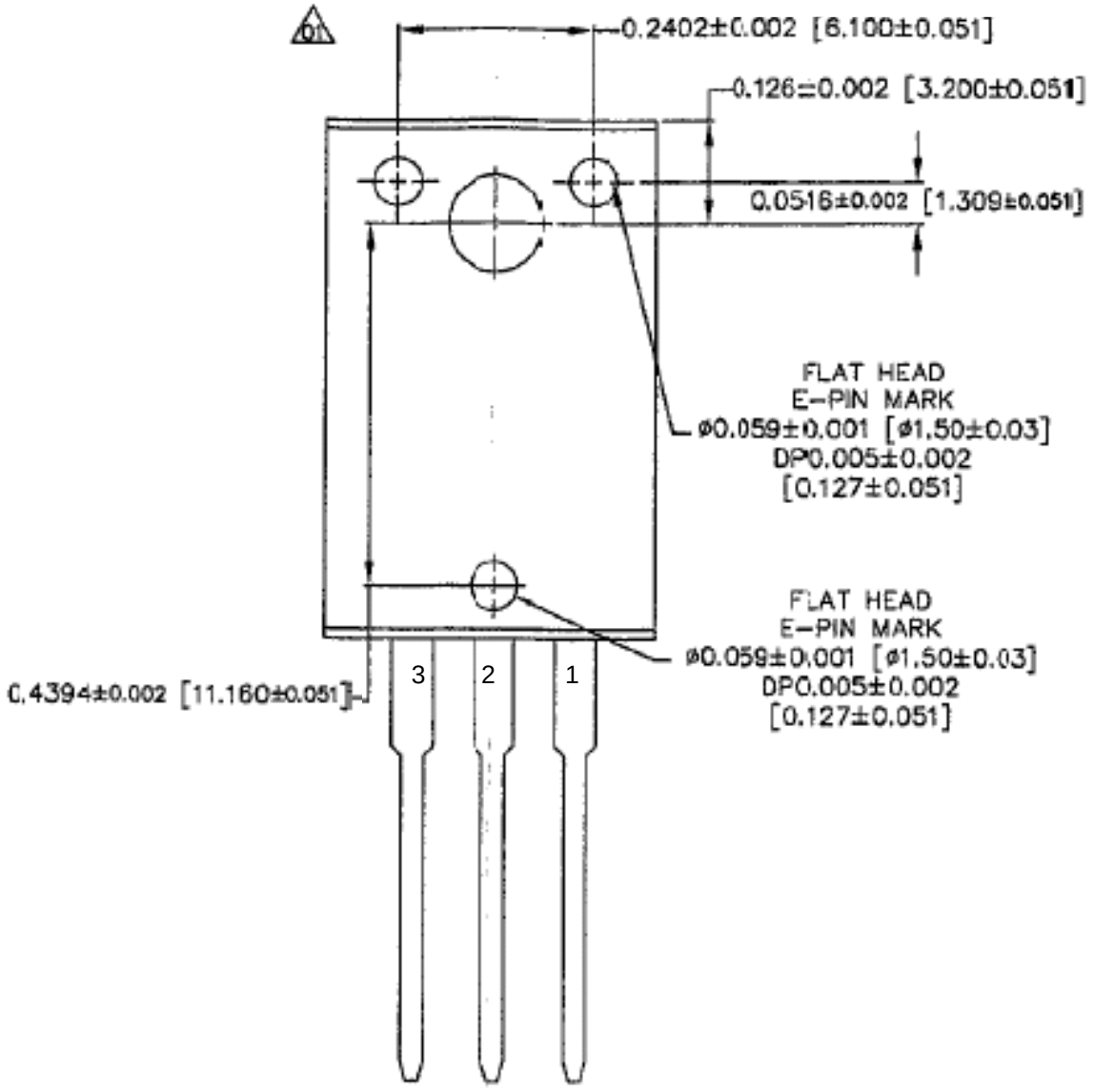


Transient Thermal Response, Junction-to-Case




0.4134±0.005 [10.500±0.127]
0.2402±0.002 [6.100±0.051]
FLAT HEAD
E-PIN MARK
ø0.059±0.001 [ø1.50±0.03]
DP0.005±0.002
[0.127±0.051]
0.0516±0.002 [1.309±0.051]
FLAT HEAD
E-PIN MARK
ø0.059±0.001 [ø1.50±0.03]
DP0.005±0.002
[0.127±0.051]
0.3811±0.005 [9.681±0.127]
0.1300±0.005 [3.302±0.127]
0.0504+0.003 −0.002 [1.280+0.076 −0.051]
0.0276+0.003 −0.002 [0.700+0.076 −0.051]
0.5036±0.005 [12.790±0.127]
0.5551±0.005 [14.100±0.127]
0.6295±0.005 [15.990±0.127]
0.5354±0.005 [13.600±0.127]
1
2
3
0.1000 [2.540]BSC
R0.024 [R0.61]typ.
(both sides)
5°


0.1850±0.005 [4.699±0.127]
0.1063±0.005 [2.700±0.127]
0.0240 +0.019 −0.012 [0.610 +0.483 −0.305]
7.0°
7.0°
ϕ0.1339 +0.002 −0.001 [3.400 +0.051 −0.025]
ϕ0.1181 +0.001 −0.002 [3.000 +0.025 −0.051]
45.0°
7.500°
(2 plcs)
0.1010±0.002 [2.565±0.051]
0.0197 +0.005 −0.002 [0.500 +0.127 −0.051]


01
0.2402±0.002 [6.100±0.051]
0.126±0.002 [3.200±0.051]
0.0516±0.002 [1.309±0.051]
FLAT HEAD
E-PIN MARK
ø0.059±0.001 [ø1.50±0.03]
DP0.005±0.002
[0.127±0.051]
FLAT HEAD
E-PIN MARK
ø0.059±0.001 [ø1.50±0.03]
DP0.005±0.002
[0.127±0.051]
0.4394±0.002 [11.160±0.051]
3
2
1