

SE18NS65A

**N-Channel Enhancement-Mode MOSFET**

Revision: A

**General Description**

Thigh Density Cell Design For Ultra Low On-Resistance Fully Characterized Avalanche Voltage and Current Improved Shoot-Through FOM

- Simple Drive Requirement
- Small Package Outline
- Surface Mount Device

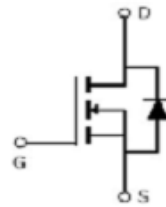
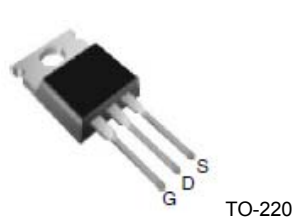
**Features**

For a single MOSFET

- $V_{DS} = 650V$
- $R_{DS(ON)} = 160m\Omega @ V_{GS}=10V$

**Pin configurations**

See Diagram below



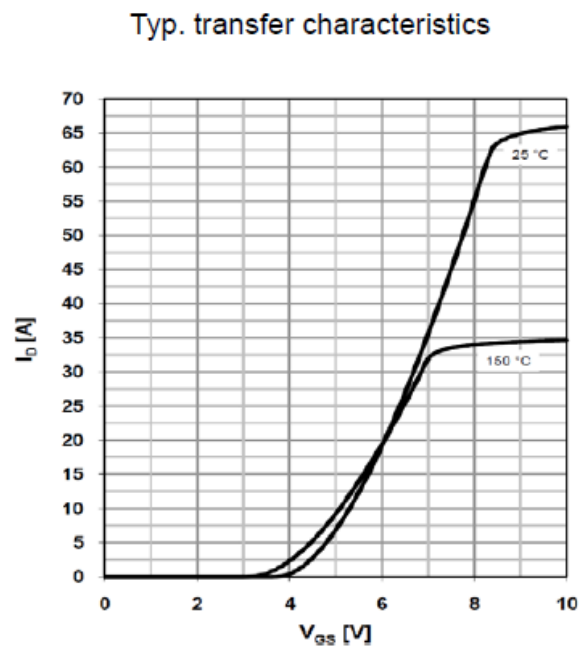
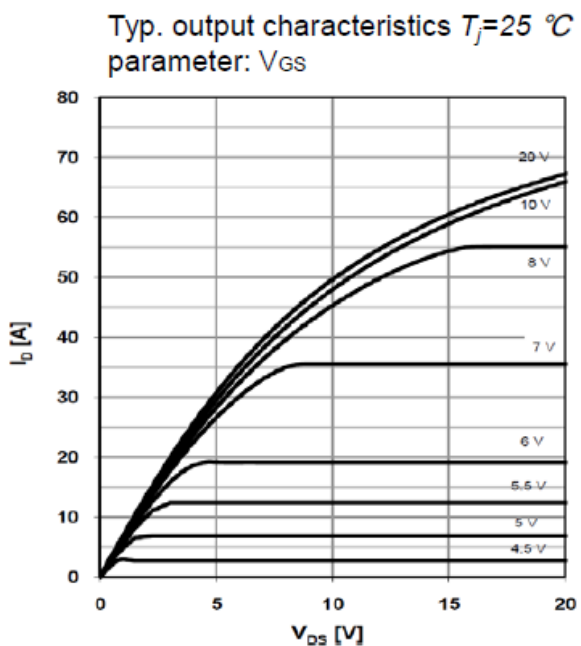
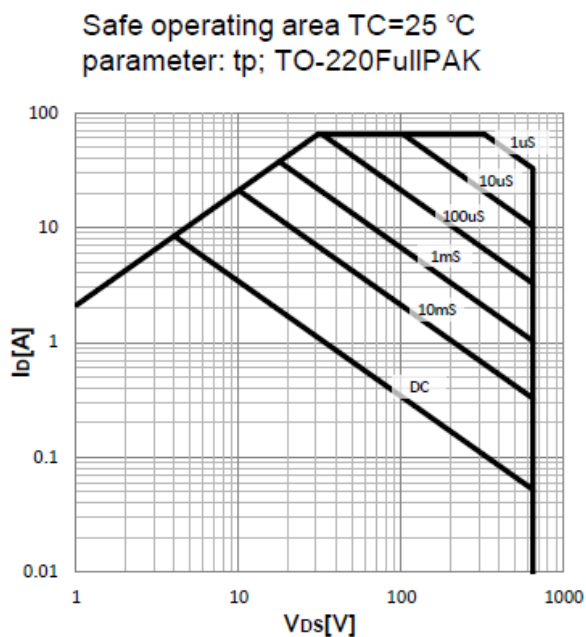
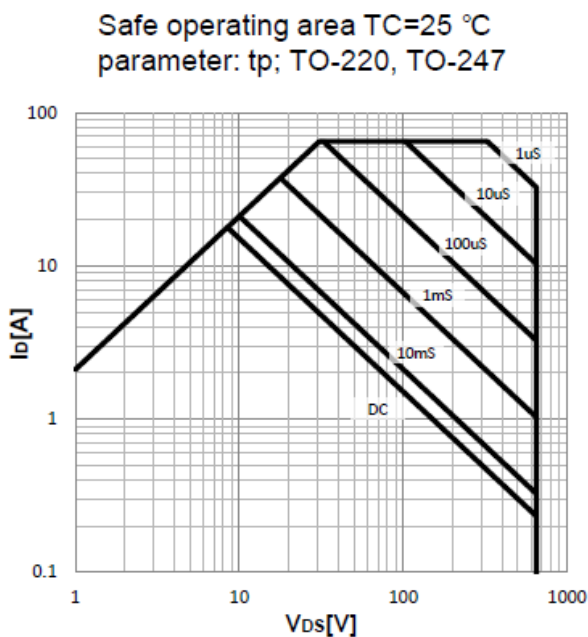
**Absolute Maximum Ratings**

Parameter		Symbol	Rating	Units
Drain-Source Voltage		$V_{DS}$	650	V
Gate-Source Voltage		$V_{GS}$	$\pm 30$	V
Drain Current	Continuous	$I_D$	20	A
	Pulsed		65	
Total Power Dissipation	@TA=25°C	$P_D$	150	W
Operating Junction Temperature Range		$T_J$	-55 to 150	°C

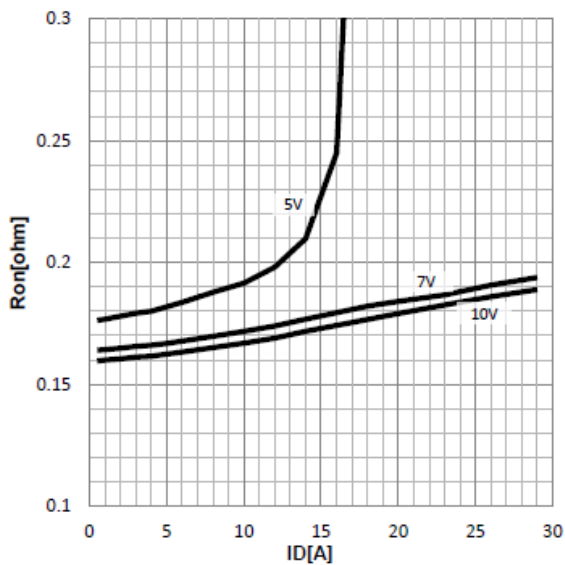
## SE18NS65A

Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS (Note 2)</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	650			V
I <sub>DSS</sub>	Drain to Source Leakage Current	V <sub>DS</sub> =650V, V <sub>GS</sub> =0V			1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =30V			100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A		160	190	mΩ
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =100V, f=1MHz		1505		pF
C <sub>oss</sub>	Output Capacitance			68		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			2.1		pF
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	V <sub>GS</sub> =10V, V <sub>DS</sub> =480V, I <sub>D</sub> =10A		36.5		nC
Q <sub>gs</sub>	Gate Source Charge			8.7		nC
Q <sub>gd</sub>	Gate Drain Charge			12.5		nC
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> =10V, V <sub>DS</sub> =400V, R <sub>GEN</sub> =20Ω I <sub>D</sub> =5A		38		ns
t <sub>d(off)</sub>	Turn-Off Delay Time			170		ns
t <sub>d(r)</sub>	Turn-On Rise Time			39		ns
t <sub>d(f)</sub>	Turn-Off Fall Time			47		ns
<b>Thermal Resistance</b>						
Symbol	Parameter	Min	Typ	Units		
R <sub>θJC</sub>	Junction to Case		0.6	°C/W		
R <sub>θJA</sub>	Junction to Ambient (t ≤ 10s)		62	°C/W		

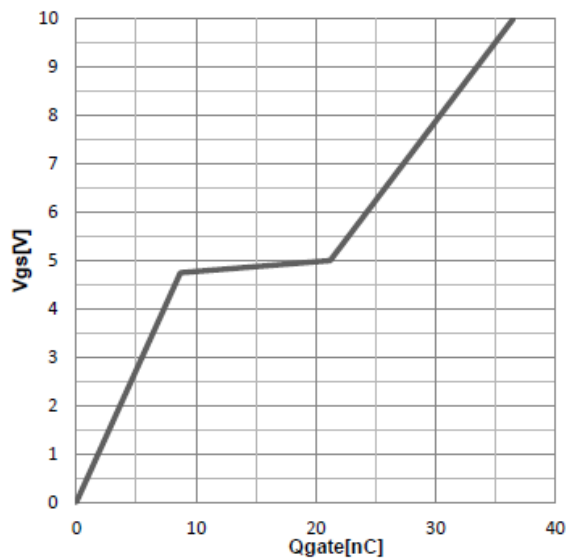
Typical Characteristics



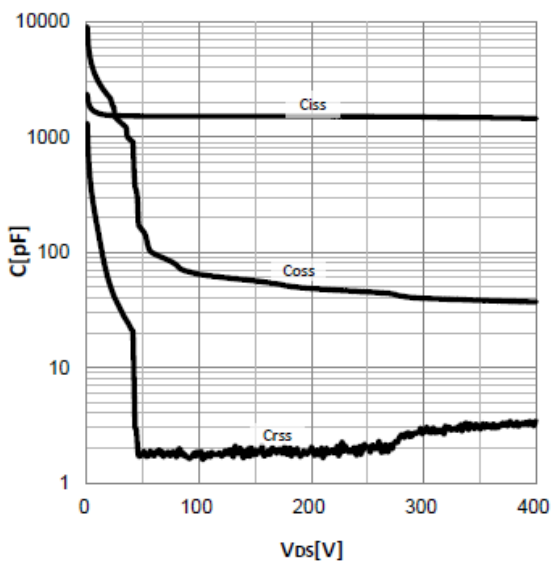
Typ. drain-source on-state resistance parameter :  $V_{GS}$



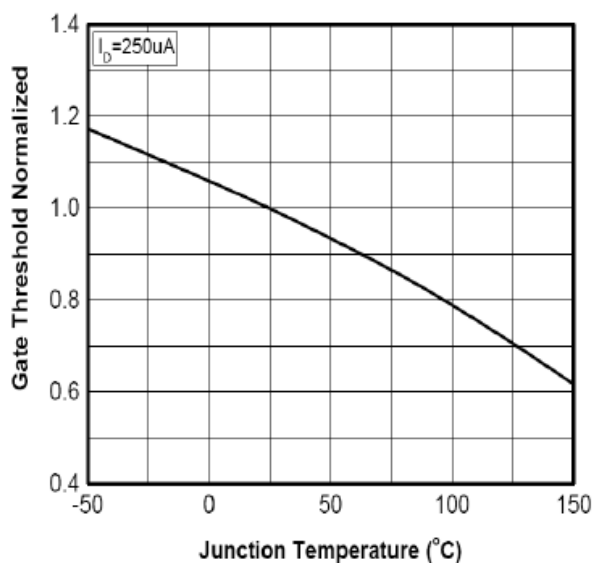
Typ. gate charge characteristics



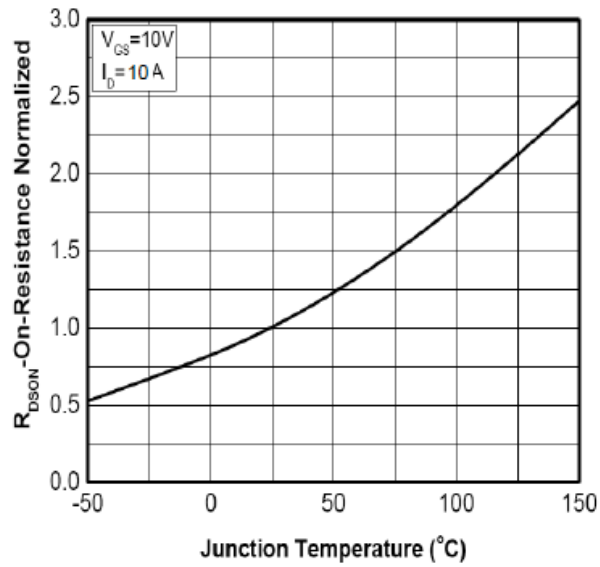
Typ. capacitances



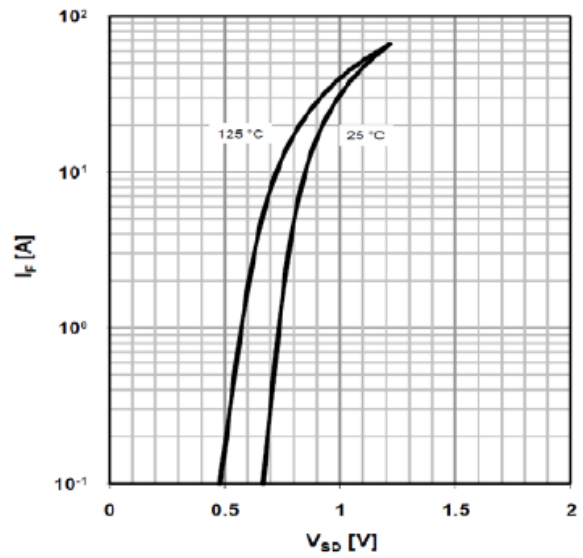
Normalized  $V_{GS(th)}$  characteristics



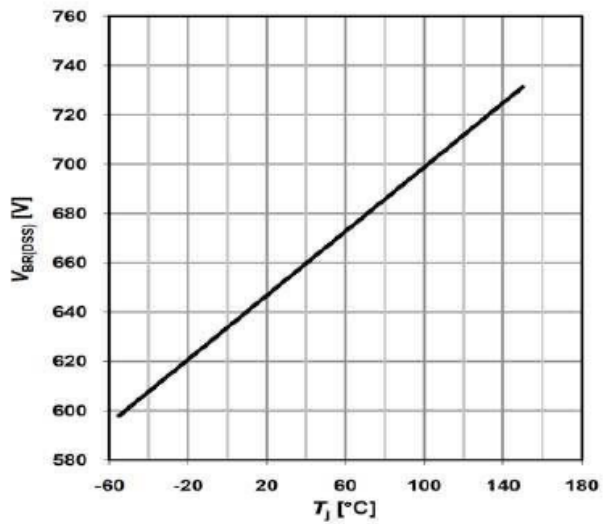
Normalized on resistance vs temperature



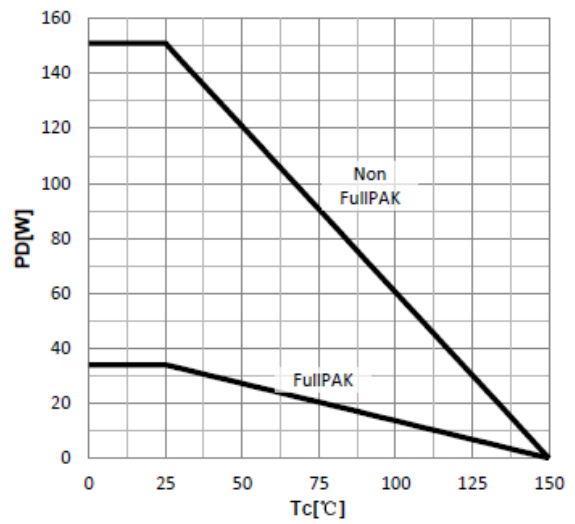
Forward characteristics of reverse diode

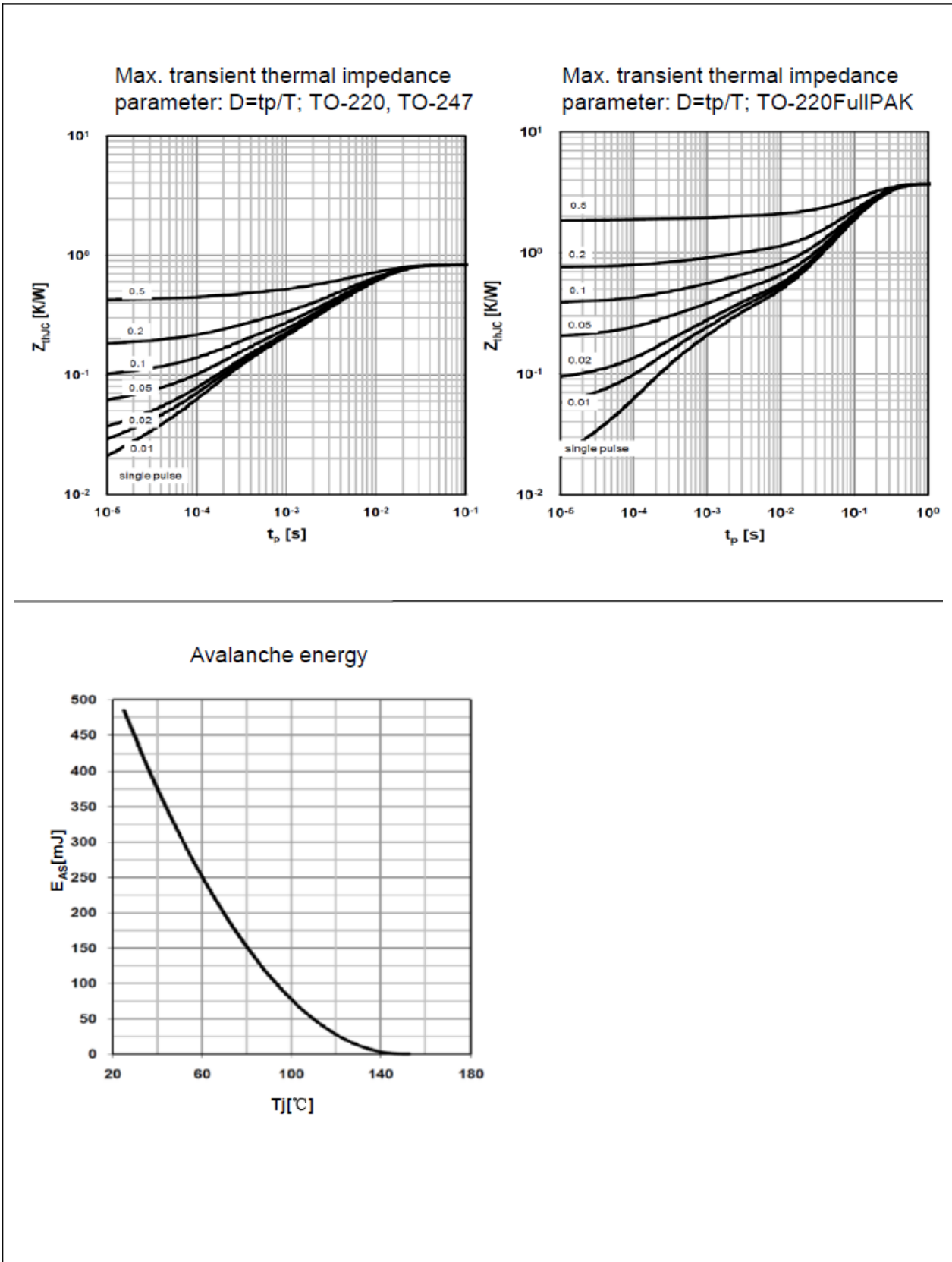


Drain-source breakdown voltage



Power dissipation

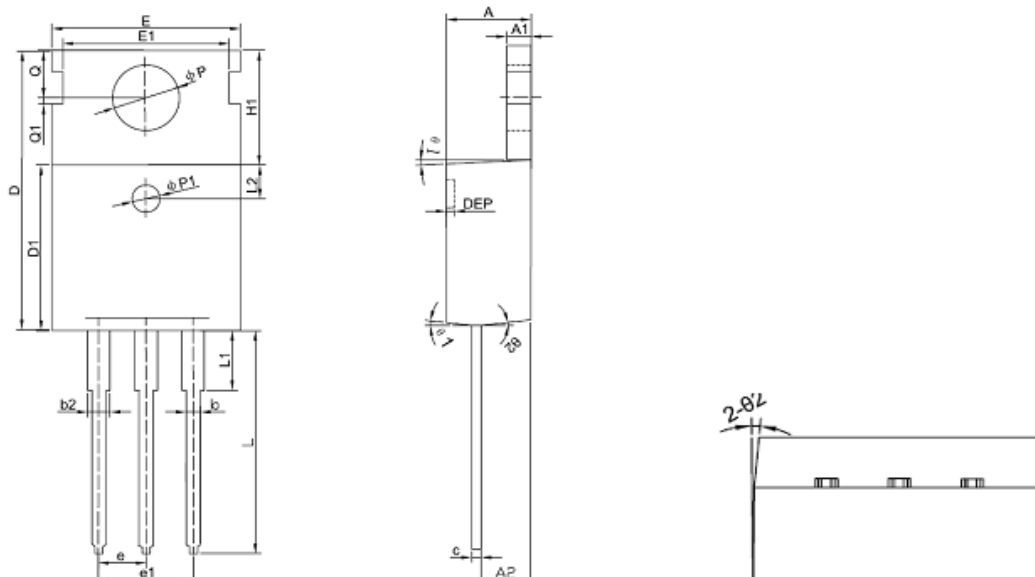




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## Package Outline Dimension

TO-220



Symbol	Dimension In Millimeters			Dimension In Inches		
	Min	Nom	Max	Min	Nom	Max
A	4.400	4.550	4.700	0.173	0.179	0.185
A1	1.270	1.300	1.330	0.050	0.051	0.052
A2	2.590	2.690	2.790	0.102	0.106	0.110
b	0.770	-	0.900	0.030	-	0.035
b2	1.230	-	1.360	0.048	-	0.054
c	0.480	0.500	0.520	0.019	0.020	0.020
D	15.100	15.400	15.700	-	0.606	-
D1	9.000	9.100	9.200	0.354	0.358	0.362
DEP	0.050	0.285	0.520	0.002	0.011	0.020
E	10.060	10.160	10.260	0.396	0.400	0.404
E1	-	8.700	-	-	0.343	-
ΦP1	1.400	1.500	1.600	0.055	0.059	0.063
e	2.54BSC			0.1BSC		
e1	5.08BSC			0.2BSC		
H1	6.100	6.300	6.500	0.240	0.248	0.256
L	12.750	12.960	13.170	0.502	0.510	0.519
L1	-	-	3.950	-	-	0.156
L2	1.85REF			0.073REF		
ΦP	3.570	3.600	3.630	0.141	0.142	0.143
Q	2.730	2.800	2.870	0.107	0.110	0.113
Q1	-	0.200	-	-	0.008	-
θ1	5 <sup>0</sup>	7 <sup>0</sup>	9 <sup>0</sup>	5 <sup>0</sup>	7 <sup>0</sup>	9 <sup>0</sup>
θ2	1 <sup>0</sup>	3 <sup>0</sup>	5 <sup>0</sup>	1 <sup>0</sup>	3 <sup>0</sup>	5 <sup>0</sup>

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