



General Features

- Low Gate Charge
- Enhancement mode
- Fast Switching
- High Power and Current Handling Capability

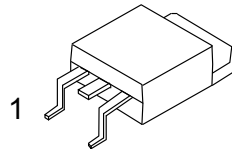
Applications

- DC-DC primary bridge
- DC-DC Synchronous rectification
- DC FAN

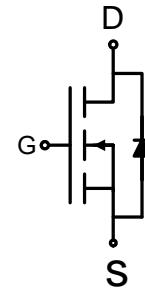
Product Summary



BVDSS	20	V
RDS(on), Typ. @ VGS=4.5 V	5	mΩ
ID	60	A



TO-252



N-channel

Absolute Maximum Ratings

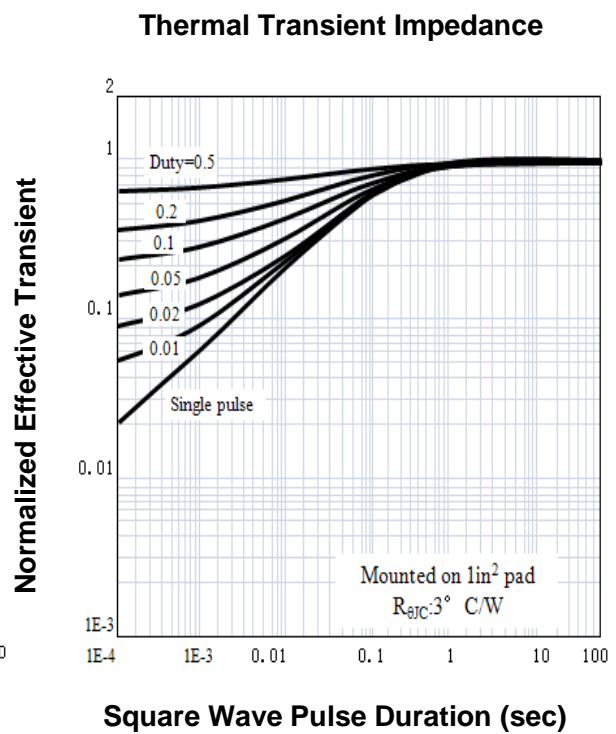
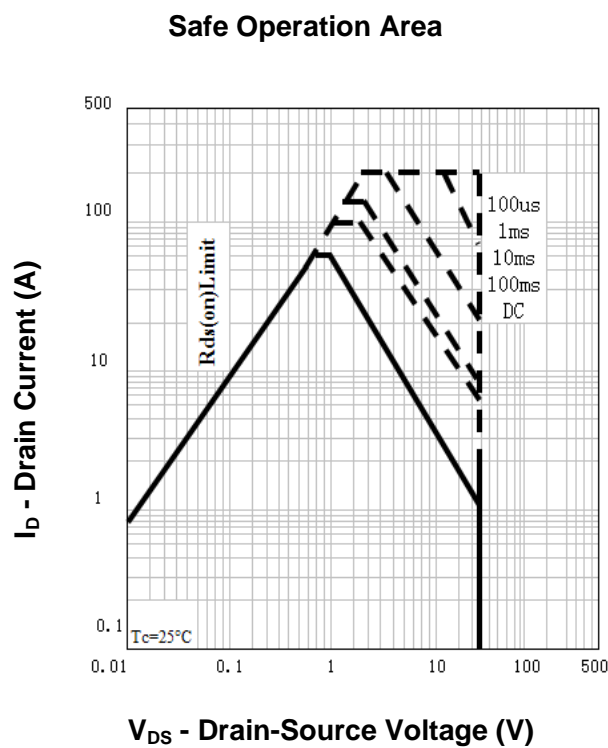
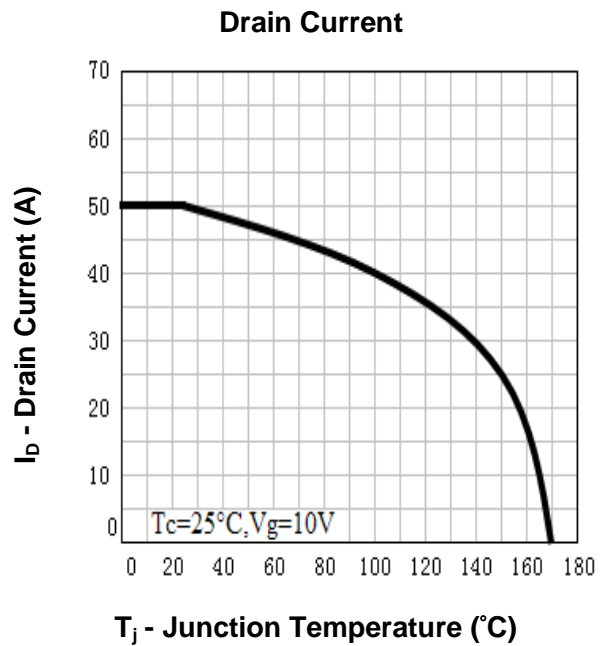
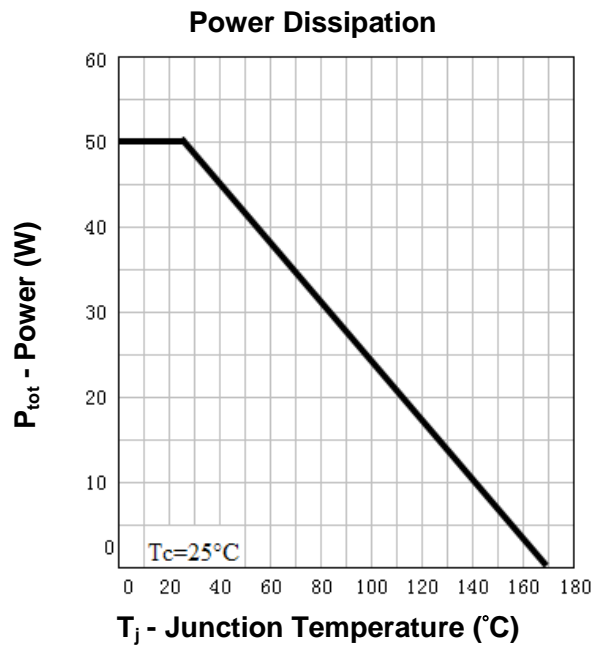
Symbol	Parameter	Rating	Unit
Common Ratings (T _A =25°C Unless Otherwise Noted)			
V _{DSS}	Drain-Source Voltage	20	V
V _{GSS}	Gate-Source Voltage	±12	
T _J	Maximum Junction Temperature	150	°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C 60	A
Mounted on Large Heat Sink			
I _{DP}	300μs Pulse Drain Current Tested	T _C =25°C 200 ^①	A
I _D	Continuous Drain Current (V _{GS} =8V)	T _C =25°C 60 ^②	A
		T _C =100°C 40	
P _D	Maximum Power Dissipation	T _C =25°C 60	W
		T _C =100°C 25	
R _{θJC}	Thermal Resistance-Junction to Case	3	°C/W
Drain-Source Avalanche Ratings			
E _{AS} ^③	Avalanche Energy, Single Pulsed	120	mJ

**Electrical Characteristics** ($T_A=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	ASDM20N60			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			1	μA
					30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.4	0.7	1.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(4)}$	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_{DS}=25A$		5	6.5	$m\Omega$
		$V_{GS}=2.5V, I_{DS}=20A$		7	10	$m\Omega$
Diode Characteristics						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=25A, V_{GS}=0V$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=25A, di_{SD}/dt=100A/\mu s$		14		ns
Q_{rr}	Reverse Recovery Charge			32		nC
Dynamic Characteristics ⁽⁵⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.2		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=15V,$ Frequency=1.0MHz		980		pF
C_{oss}	Output Capacitance			160		
C_{rss}	Reverse Transfer Capacitance			80		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=15V, R_L=15\Omega,$ $I_{DS}=25A, V_{GEN}=8V,$ $R_G=6\Omega$		6		ns
t_r	Turn-on Rise Time			10		
$t_{d(OFF)}$	Turn-off Delay Time			24		
t_f	Turn-off Fall Time			5		
Gate Charge Characteristics ⁽⁵⁾						
Q_g	Total Gate Charge	$V_{DS}=15V, V_{GS}=8V,$ $I_{DS}=25A$		18	23	nC
Q_{gs}	Gate-Source Charge			2.5		
Q_{gd}	Gate-Drain Charge			5		

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature. Current limited by bond wire.
 - ③ Limited by $T_{Jmax}, I_{AS}=20A, V_{DD}=15V, R_G=50\Omega$, Starting $T_J=25^\circ\text{C}$.
 - ④ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑤ Guaranteed by design, not subject to production testing.

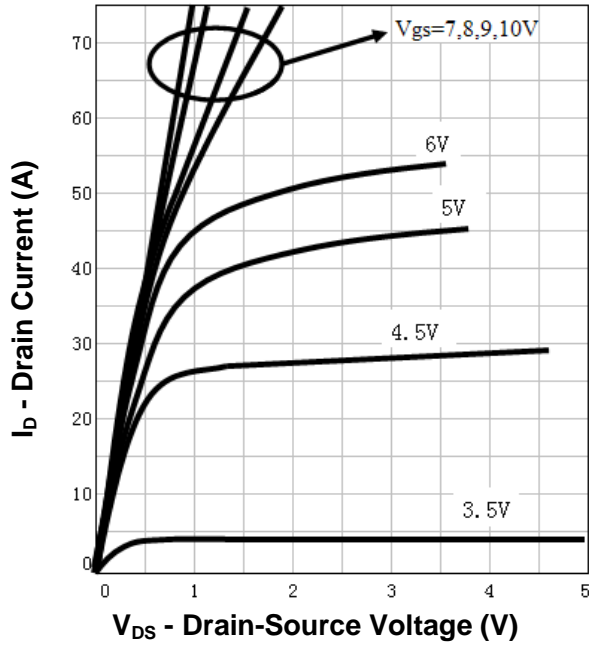
Typical Characteristics



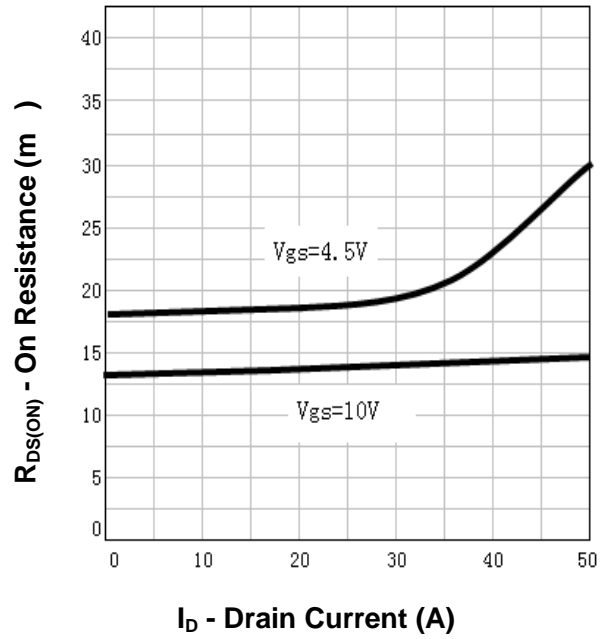


Typical Characteristics

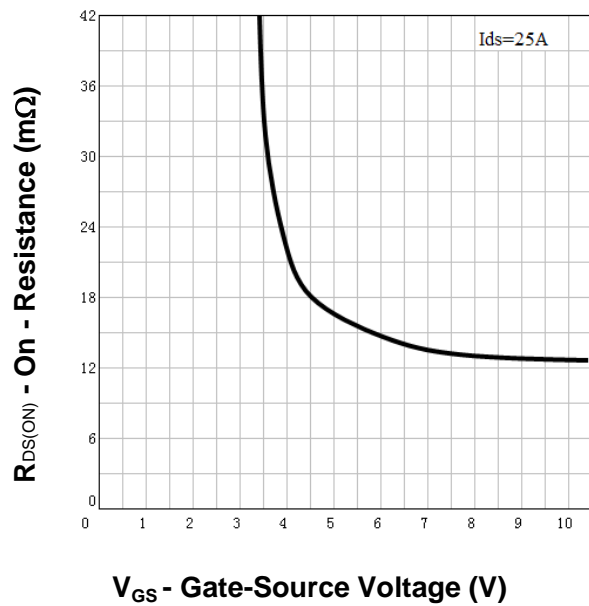
Output Characteristics



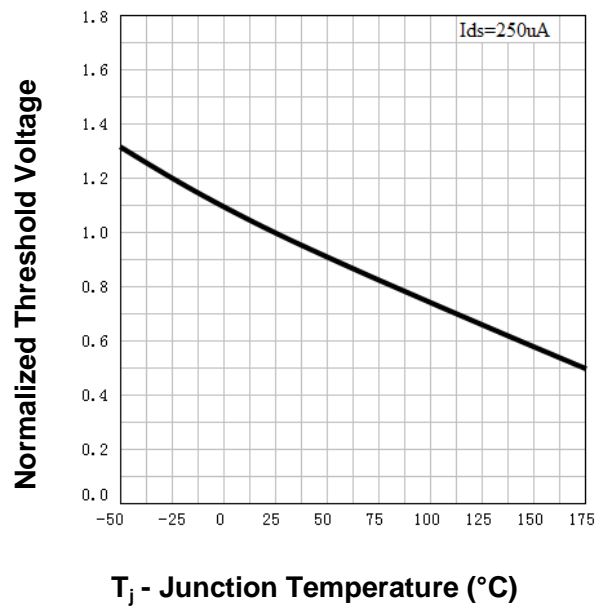
Drain-Source On Resistance



Drain-Source On Resistance

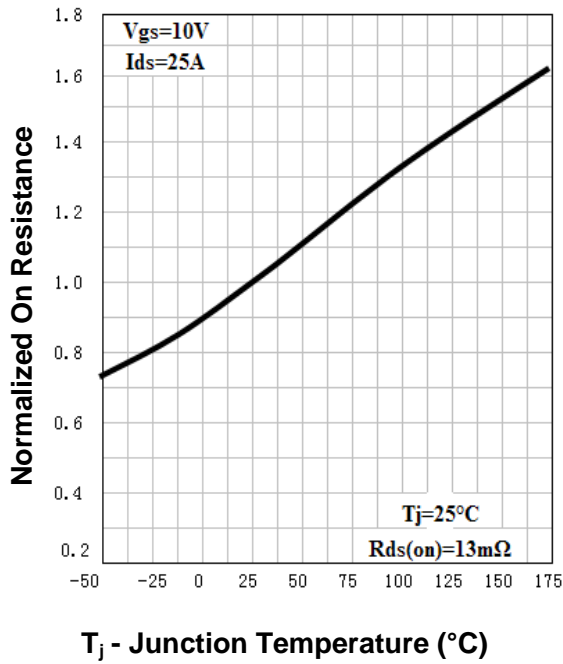


Gate Threshold Voltage

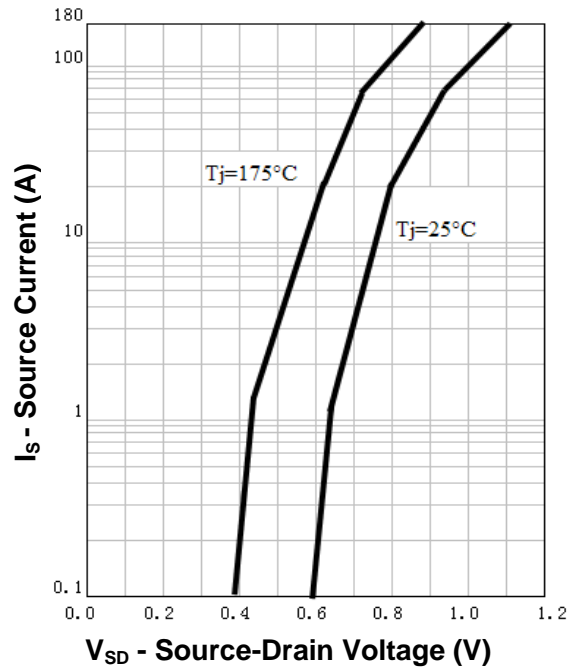


Typical Characteristics

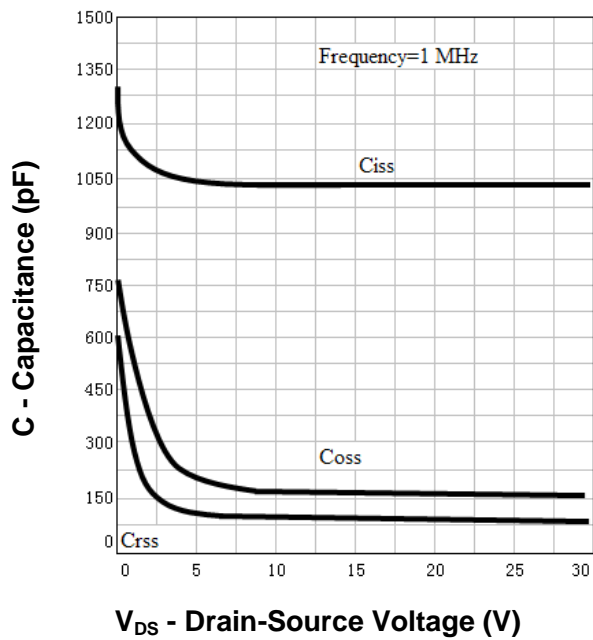
Drain-Source On Resistance



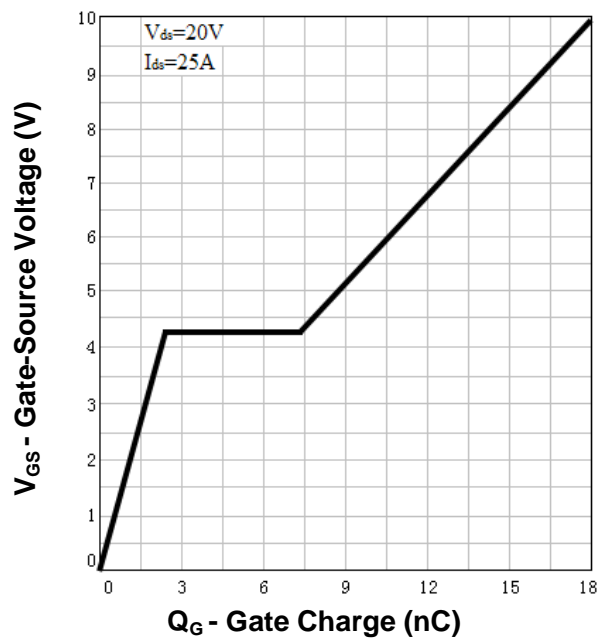
Source-Drain Diode Forward



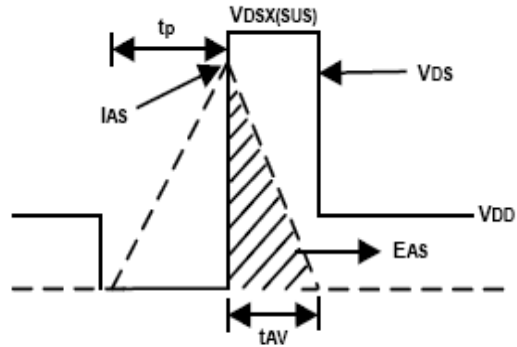
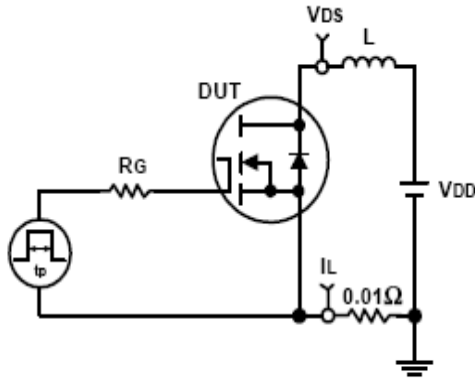
Capacitance



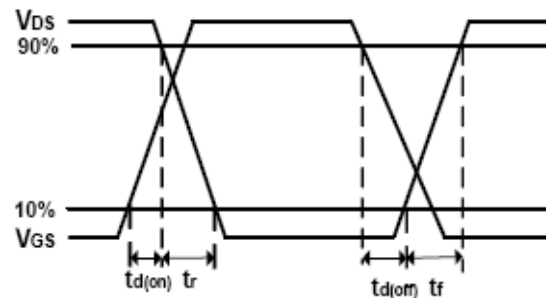
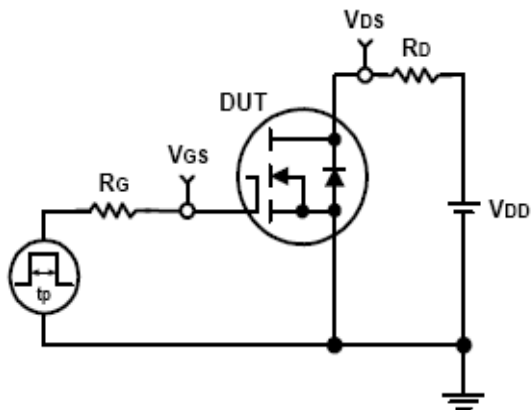
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms





Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity
ASDM20N60	20N60	TO-252	Tape&Reel	2500/Reel

PACKAGE	MARKING
TO-252	

Ordering Number		Package
Lead Free	Halogen Free	
ASDM20N60-KQ-R	ASDM20N60G-KQ-R	TO-252

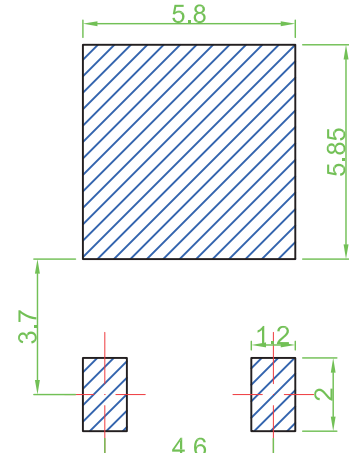
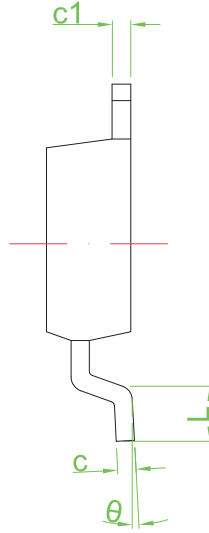
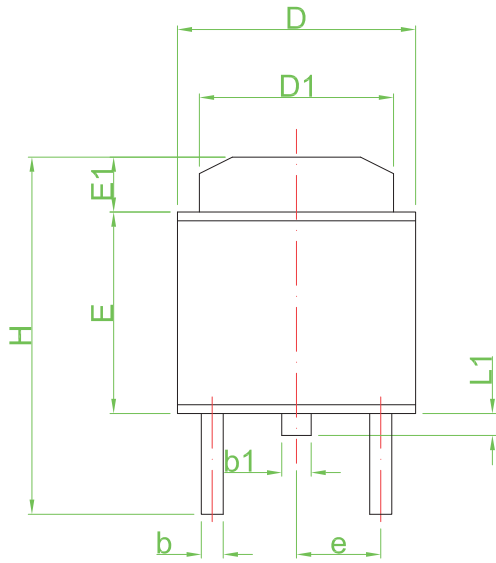
<p>ASDM20N60G-KQ-R</p> <p>1 Packing Type 2 Package Type 3 Green Package</p>	<p>1 R:Tape Reel 2 KQ: TO-252 3 blank : Lead Free G:Halogen Free</p>
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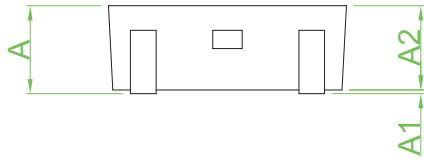
ASCENDSEMI

ASDM20N60

20V N-Channel MOSFET



Recommended Land Pattern



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	2.25	2.65	0.089	0.104
A1	0.00	0.15	0.000	0.006
A2	2.20	2.40	0.087	0.094
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.46	0.66	0.018	0.026
c1	0.46	0.66	0.018	0.026
D	6.30	6.70	0.248	0.264
D1	5.20	5.40	0.205	0.213
E	5.30	5.70	0.209	0.224
E1	1.40	1.60	0.055	0.063
H	9.40	9.90	0.370	0.390
e	2.30 TYP		0.09 TYP	
L	1.40	1.77	0.055	0.070
L1	0.50	0.70	0.020	0.028
θ	0°	8°	0°	8°



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