General Features

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Optimized for synchronous rectification Low Input Capacitance

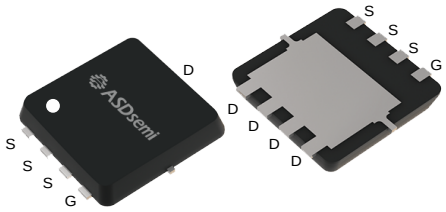
Product Summary

RoHS

V_{DS}	100	V
$R_{DS(on),Typ}$@ V_{GS}=10 V	3.4	mΩ
I_D	118	A

Application

- Automotive applications
- Hard switched and high frequency circuits
- BLDC Motor drive applications
- Battery powered circuits



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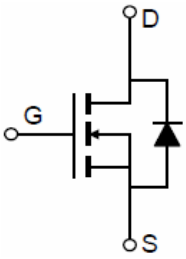


Schematic diagram

Absolute Maximum Ratings (T_J=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous	T_C=25°C	I_D	118	A
	T_C=100°C		62	A
Drain Current-Pulsed Note 1	T_C=25°C	I_{DM}	472	A
Avalanche Current		I_{AR}	34	A
Single Pulse Avalanche Energy Note 3		E_{AS}	29	mJ
Maximum Power Dissipation	T_C=25°C	P_D	73	W
Operating Junction Temperature Range		T_J	150	°C

Thermal Resistance Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Junction-to-Ambient Note 2	$R_{\theta JA}$	Steady State	-	54.5	-	°C/W
Thermal resistance, Junction-to-Case	$R_{\theta JC}$	Steady State	-	1.7	-	°C/W

Notes:

1. Pulse Test: Pulse Width ≤ 10ms, Duty Cycle ≤ 1%.
2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 in still air.
3. Starting T_J=25°C, L=0.1mH, R_g=50Ω, V_{GS}=10V.

Electrical Characteristics (T_J=25°C unless otherwise noted)

STATIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_{DS}=1mA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V, V_{GS}=0V, T_J=25°C	-	-	10	μA
		V_{DS}=80V, V_{GS}=0V, T_J=125°C	-	-	100	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA

STATIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_{DS}=250μA	1.2	1.8	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_{DS}=50A	-	3.4	4.5	mΩ
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_{DS}=20A	-	4.6	6.5	mΩ
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	1.2	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=5V, I_{DS}=20A	-	43.0	-	S

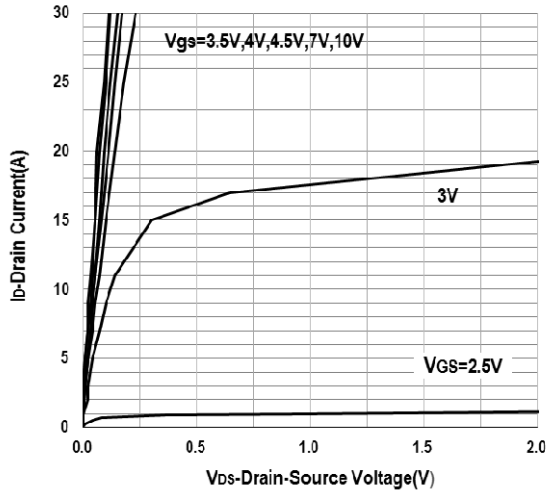
DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C_{iss}	V_{DS}=50V, V_{GS}=0V, f=1MHz	-	4117	-	pF
Output Capacitance	C_{oss}	V_{DS}=50V, V_{GS}=0V, f=1MHz	-	654	-	pF
Reverse Transfer Capacitance	C_{rss}	V_{DS}=50V, V_{GS}=0V, f=1MHz	-	44	-	pF
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=50V, V_{GS}=10V, I_{DS}=45A, R_{GEN}=3.6Ω	-	13.7	-	ns
Rise Time	t_r	V_{DS}=50V, V_{GS}=10V, I_{DS}=45A, R_{GEN}=3.6Ω	-	36.0	-	ns
Turn-Off Delay Time	$T_{d(off)}$	V_{DS}=50V, V_{GS}=10V, I_{DS}=45A, R_{GEN}=3.6Ω	-	54.4	-	ns
Fall Time	t_f	V_{DS}=50V, V_{GS}=10V, I_{DS}=45A, R_{GEN}=3.6Ω	-	40.3	-	ns

GATE CHARGE CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate to Source Gate Charge	Q_{gs}	V_{DD}=50V, I_D=30A,	-	14.6	-	nC
Gate charge at threshold	$Q_{g(th)}$	V_{DD}=50V, I_D=30A,	-	8.0	-	nC
Gate to Drain Charge	Q_{gd}	V_{DD}=50V, I_D=30A,	-	21.4	-	nC
Switching charge	Q_{SW}	V_{DD}=50V, I_D=30A,	-	28	-	nC
Gate charge total	Q_g	V_{DD}=50V, I_D=30A, V_{GS}=0 to 10V	-	78	-	nC
Gate plateau voltage	$V_{plateau}$	V_{DD}=50V	-	3.6	-	V
Gate charge total, sync. FET (Q_g- Q_{gd})	$Q_{g(sync)}$	V_{DS}=0.1V	-	56.6	-	nC

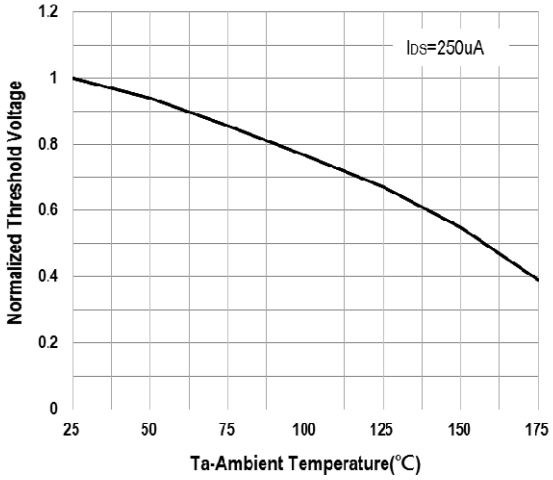
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=20A	-	0.8	1.3	V
Body Diode Reverse Recovery Time	t_{rr}	V_{DD}=50V, I_F=20A, di/dt=100A/μs	-	52	-	ns
		V_{DD}=50V, I_F=20A, di/dt=200A/μs	-	46.4	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	V_{DD}=50V, I_F=20A, di/dt=100A/μs	-	70.6	-	nC
		V_{DD}=50V, I_F=20A, di/dt=200A/μs	-	131.8	-	nC
Reverse Recovery Current	I_{RRM}	V_{DD}=50V, I_F=20A, di/dt=100A/μs	-	2.4	-	A
		V_{DD}=50V, I_F=20A, di/dt=200A/μs	-	4.9	-	A

Typical Operating Characteristics

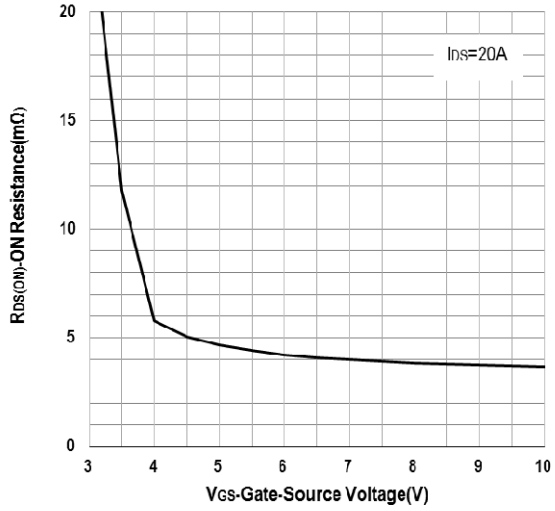
Output Characteristics



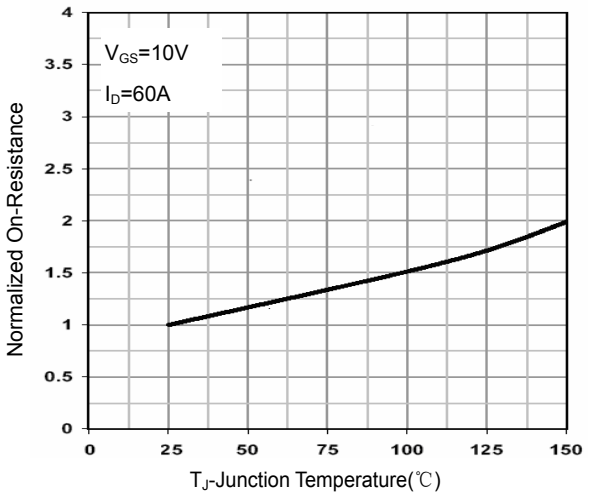
Gate Threshold Voltage



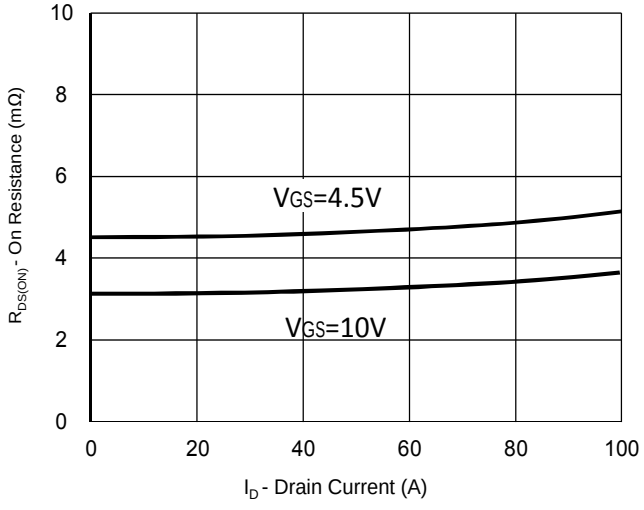
Gate-Source On Resistance



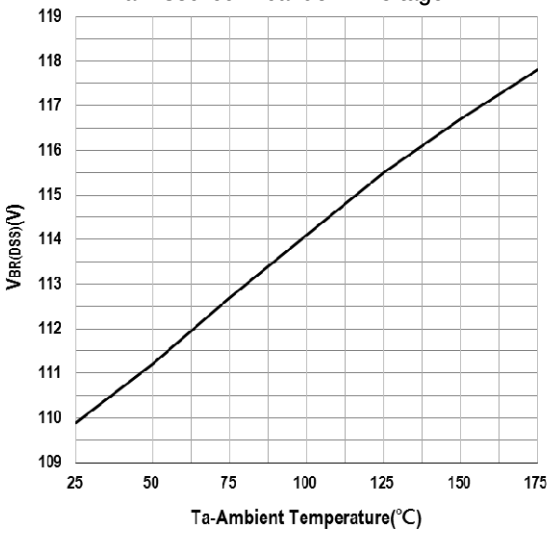
Drain-Source On Resistance



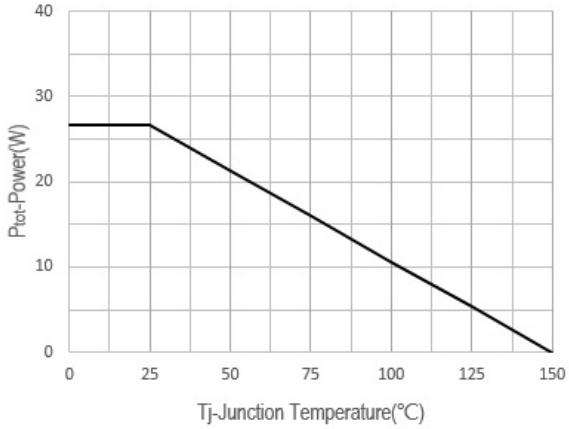
Drain-Source On Resistance



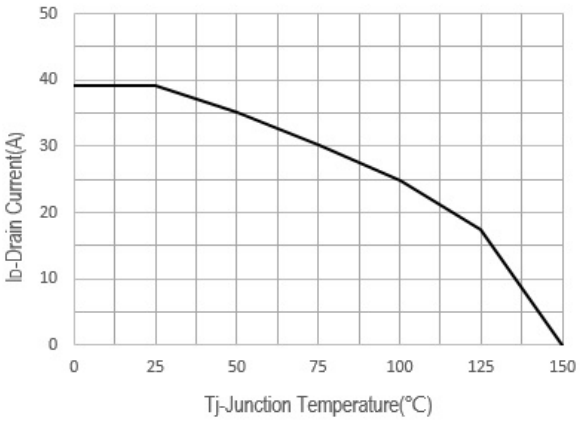
Drain-source Breakdown Voltage



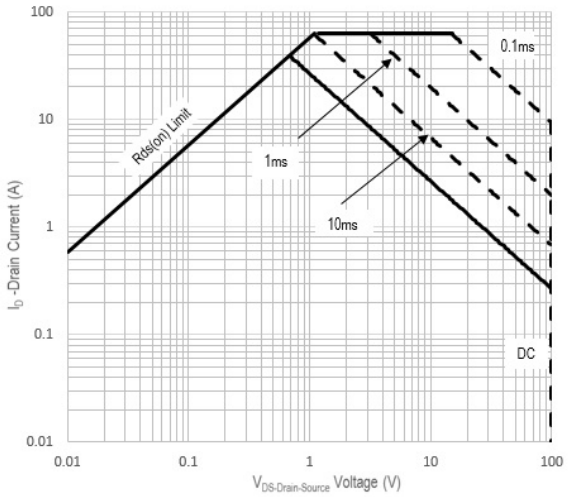
Power Dissipation



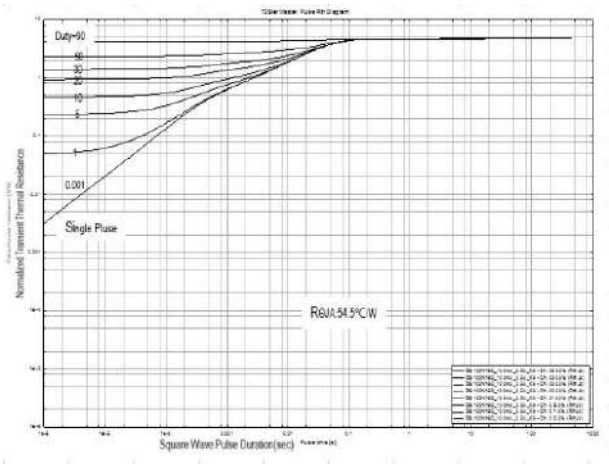
Drain Current



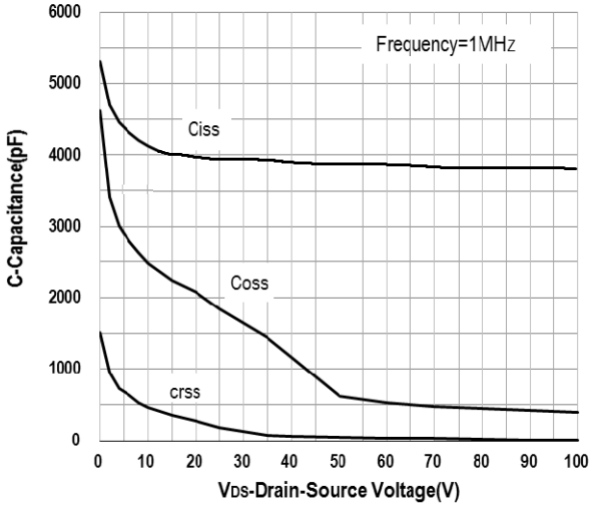
Safe Operation Area



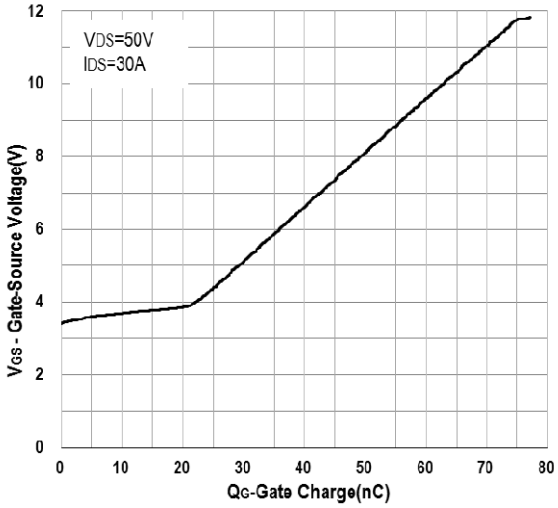
Transient Thermal Impedance



Capacitance

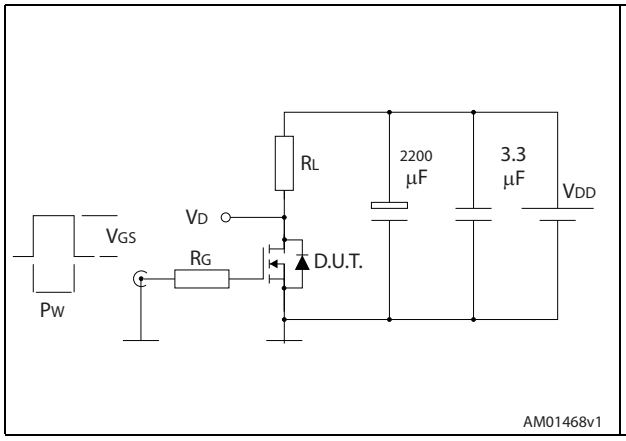


Gate Charge

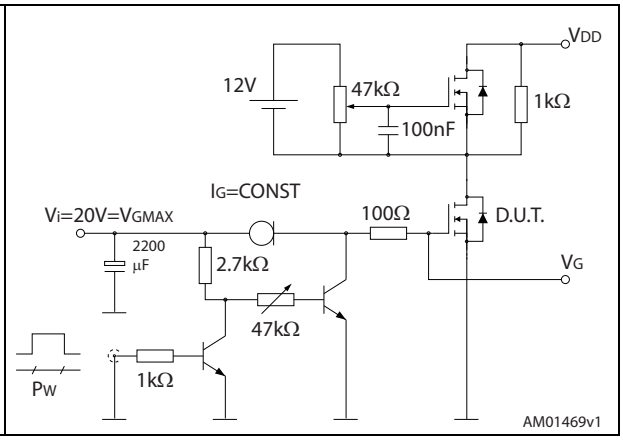


Test circuits

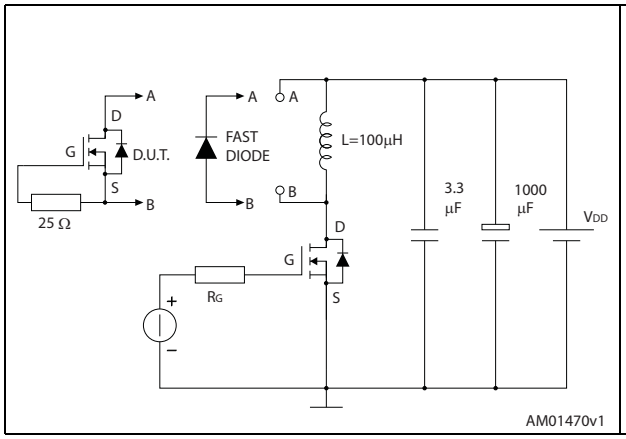
Switching times test circuit for resistive load



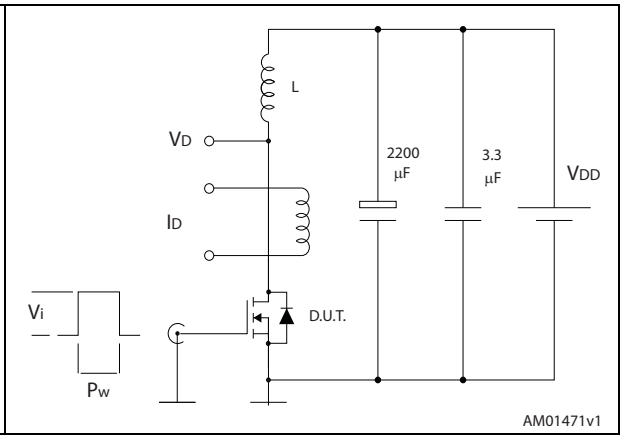
Gate charge test circuit



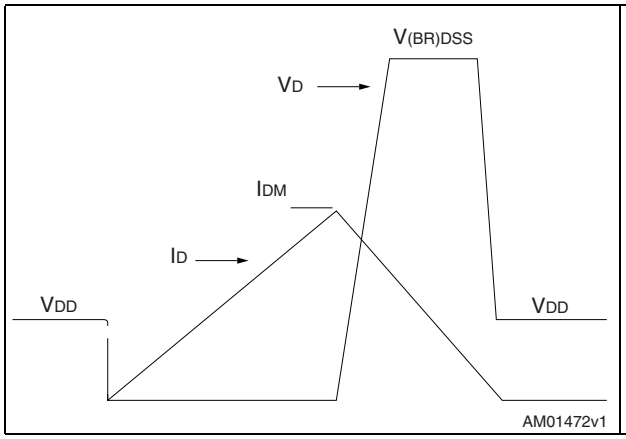
Test circuit for inductive load switching and diode recovery times



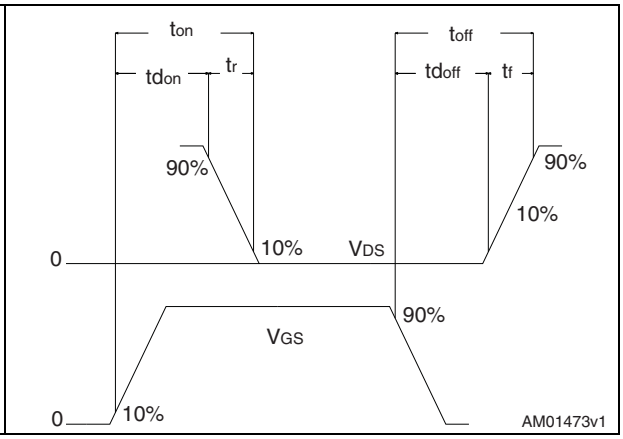
Unclamped inductive load test circuit



Unclamped inductive waveform

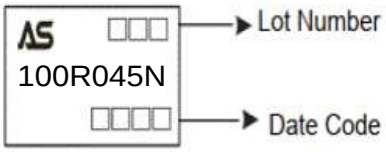


Switching time waveform

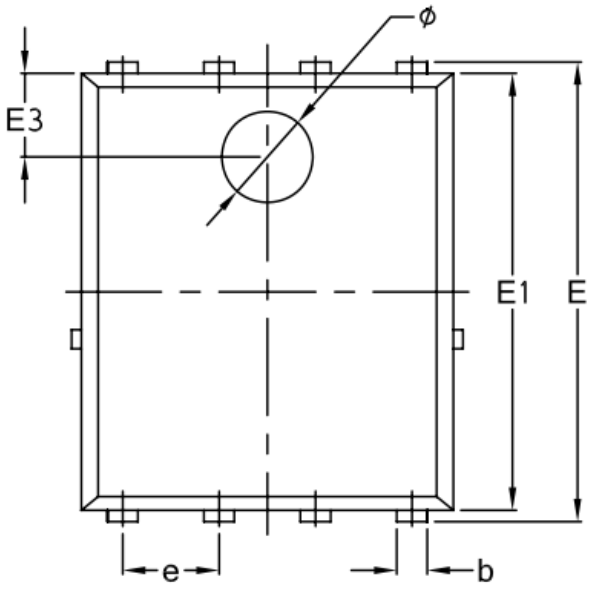


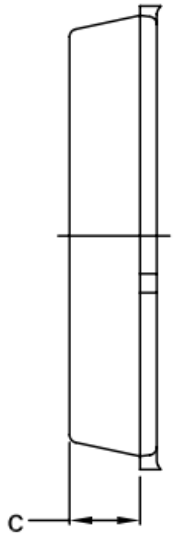
Ordering and Marking Information

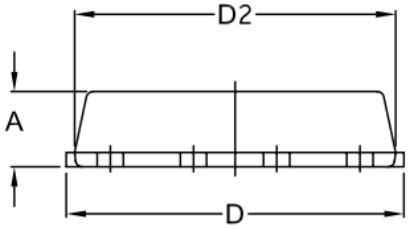
Ordering Device No.	Marking	Package	Packing	Quantity
ASDM100R045NQ-R	100R045N	PDFN5*6-8	Tape&Reel	4000/Reel

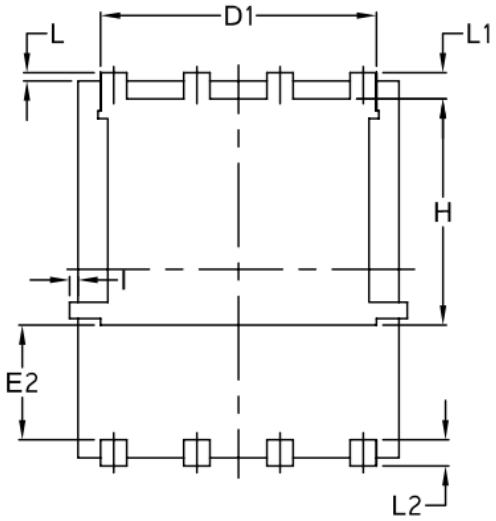
PACKAGE	MARKING
PDFN5*6-8	

PDFN5*6-8









SYMBOL	COMMON			
	MM		INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	—	0.0630	—
E3	1.00	1.20	0.0394	0.0472
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	—	0.18	—	0.0070
ϕ	1.10	1.30	0.0433	0.0512

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