

Features

- 100% avalanche tested
- Pb-free lead plating; RoHS compliant

Application

- Synchronous Rectification
- PWM Application
- Power management
- Load Switch
- DC-DC converter

Product Summary

● N-Channel

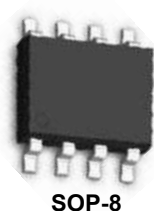


V_{DS}		40	V
$R_{DS(on), Typ}$	$V_{GS}=10V$	7.7	$m\Omega$
$R_{DS(on), Typ}$	$V_{GS}=4.5V$	9.8	$m\Omega$
I_D		10.9	A

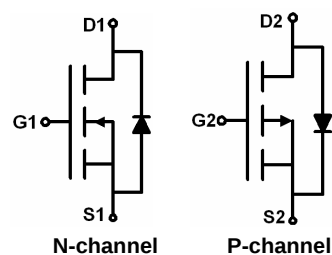
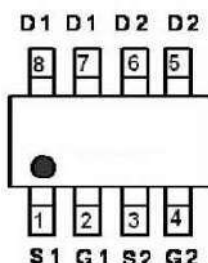
● P-Channel

V_{DS}		-40	V
$R_{DS(on), Typ}$	$V_{GS}=-10V$	14.8	$m\Omega$
$R_{DS(on), Typ}$	$V_{GS}=-4.5V$	18.4	$m\Omega$
I_D		-7.6	A

Top view



SOP-8



Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	40	-40	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current $T_C=25^\circ\text{C}$	I_D	10.9	-7.6	A
Pulsed Drain Current (Note 1)	I_{DM}	43.6	-30.4	A
Avalanche Energy, Single Pulse	E_{AS}	10	15	mJ
Maximum Power Dissipation	P_D	2	2	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	-55 To 150	$^\circ\text{C}$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note2)	$R_{\theta JA}$	N-Ch	62.5	$^\circ\text{C/W}$
		P-Ch	62.5	

Notes: EAS condition, $V_{DS}=\pm 20V, V_{GS}=\pm 10V, L=0.5mH, R_g=25\Omega$

N-CH Electrical Characteristics at Tj=25°C (unless otherwise specified) Static Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.5	2.5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS}=0V, V_{DS}=40V, T_j=25^\circ C$	-	0.01	1	μA
		$V_{GS}=0V, V_{DS}=40V, T_j=100^\circ C$		-	100	
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	10	± 100	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	7.7	9.3	m Ω
		$V_{GS}=4.5V, I_D=15A$	-	9.8	12	
Gate Resistance	R_G	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	-	1.8	-	Ω

Dynamic Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=20V, f=1MHz$	-	1980	-	pF
Output Capacitance	C_{oss}		-	239	-	
Reverse Transfer Capacitance	C_{rss}		-	183	-	
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=20V, I_D=30A$	-	48	-	nC
Gate-Source Charge	Q_{gs}		-	6.5	-	
Gate-Drain Charge	Q_{gd}		-	12	-	
Turn on delay time	$t_{d(on)}$	$V_{DS}=20V, I_D=30A,$ $V_{GS}=10V$ $R_G=1\Omega, V_{GS}=10V$		7.5		ns
Rise time	t_r			16		
Turn off delay time	$t_{d(off)}$			22		
Fall time	t_f			10		

Diode Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=20A$	-	0.83	1.2	V

P-CH Electrical Characteristics at Tj=25°C (unless otherwise specified) Static Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	-40	-		V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	-1.0	-1.8	-2.5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS}=0V, V_{DS}=-40V, T_j=25^\circ C$	-	-0.01	-1	μA
		$V_{GS}=0V, V_{DS}=-40V, T_j=100^\circ C$		-	-100	
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	10	± 100	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$	-	14.8	19	m Ω
		$V_{GS}=-4.5V, I_D=-15A$	-	18.4	23	
Gate Resistance	R_G	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	-	6.5	-	Ω

Dynamic Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=-30V, f=1MHz$	-	1938	-	pF
Output Capacitance	C_{oss}		-	242	-	
Reverse Transfer Capacitance	C_{rss}		-	140	-	
Total Gate Charge	Q_g	$V_{GS}=-4.5V, V_{DS}=-20V, I_D=-30A$	-	58	-	nC
Gate-Source Charge	Q_{gs}		-	7	-	
Gate-Drain Charge	Q_{gd}		-	10	-	
Turn on delay time	$t_{d(on)}$	$V_{GS}=-10V, V_{DD}=-20V, I_D=-15A, R_{GEN}=6.3$		10		ns
Rise time	t_r			24		
Turn off delay time	$t_{d(off)}$			40		
Fall time	t_f			9		

Diode Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-20A$	-	-0.92	-1.2	V

N- Channel Typical Performance Characteristics

Figure1: Output Characteristics

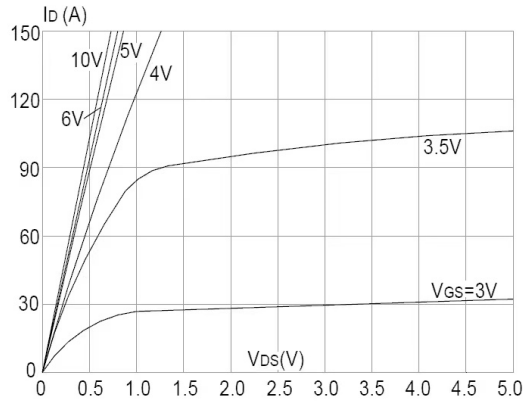


Figure 2: Typical Transfer Characteristics

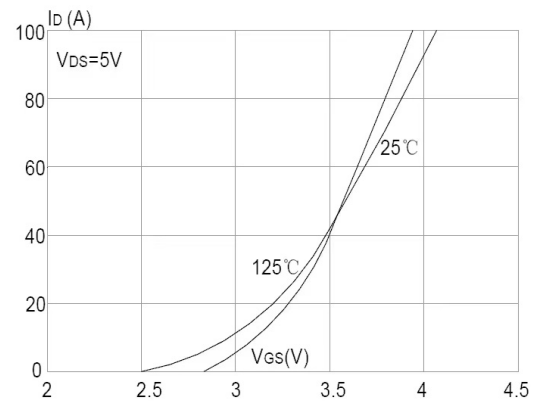


Figure 3: On-resistance vs. Drain Current

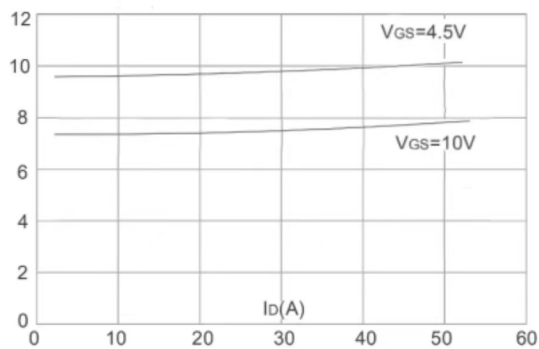


Figure 4: Body Diode Characteristics

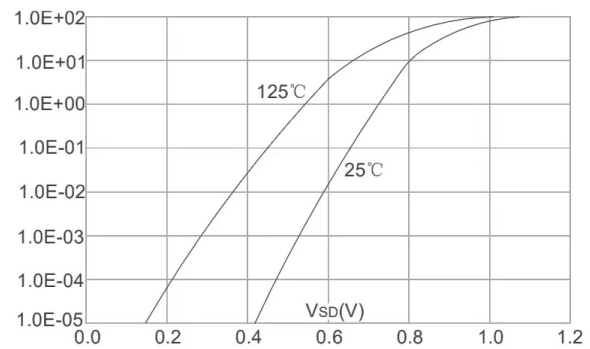


Figure 5: Gate Charge Characteristics

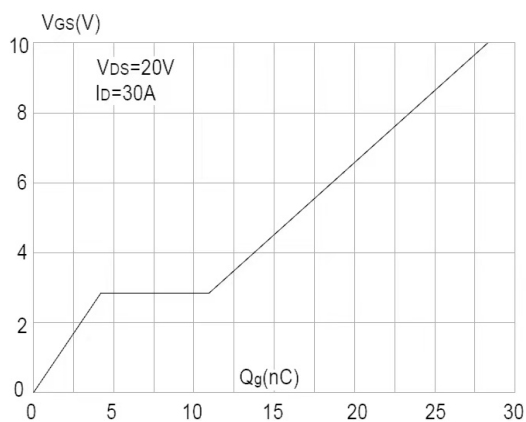


Figure 6: Capacitance Characteristics

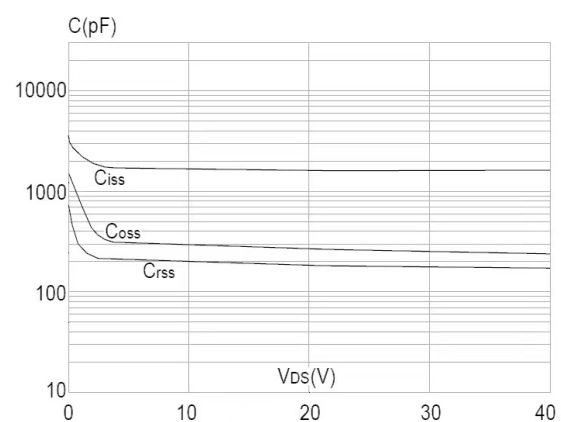


Figure 7: Normalized Breakdown Voltage
vs. Junction Temperature

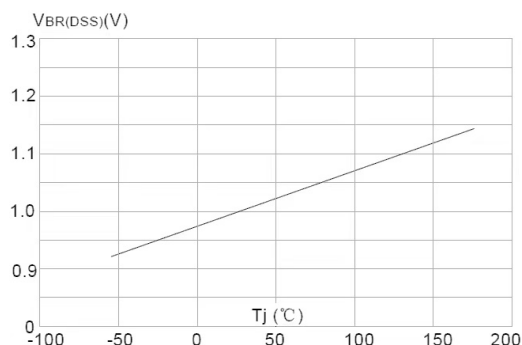


Figure 8: Normalized on Resistance
vs. Junction Temperature

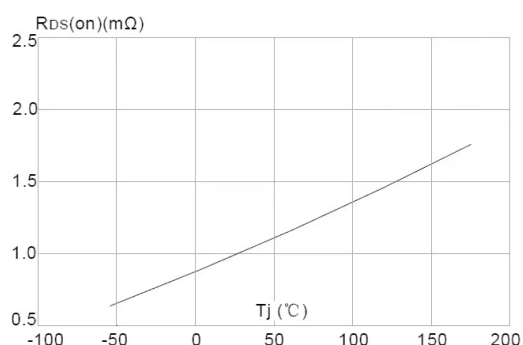


Figure 9: Maximum Safe Operating Area

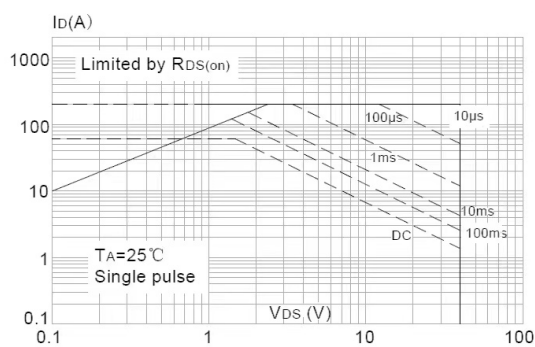


Figure 10: Maximum Continuous Drain Current
vs. Case Temperature

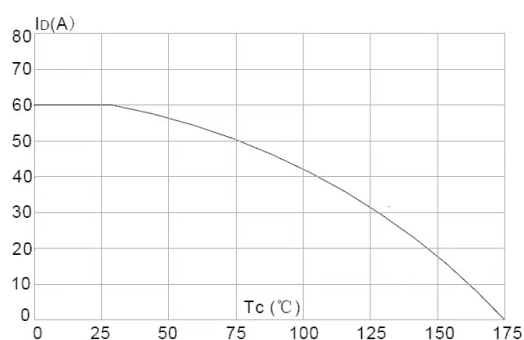
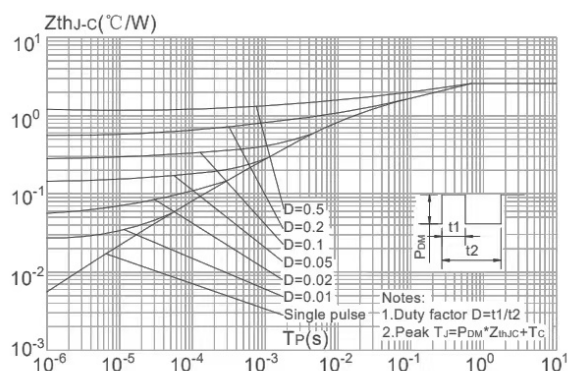


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to- Case



P- Channel Typical Performance Characteristics

Figure1: Output Characteristics

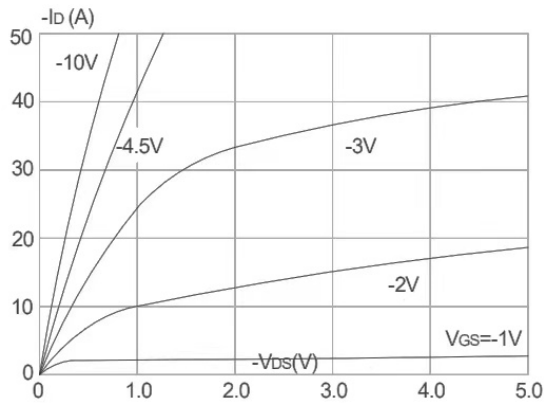


Figure 2: Typical Transfer Characteristics

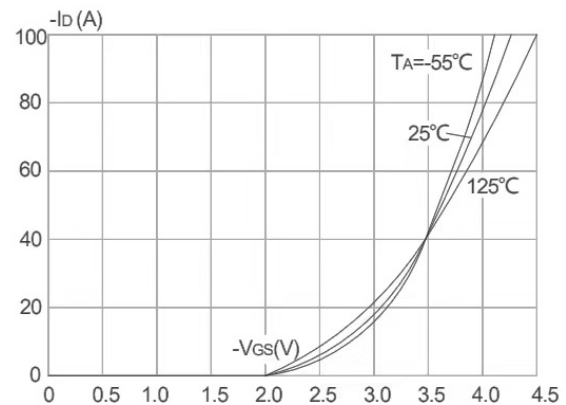


Figure 3: On-resistance vs. Drain Current

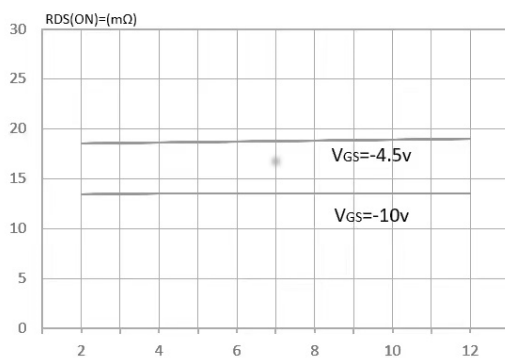


Figure 4: Body Diode Characteristics

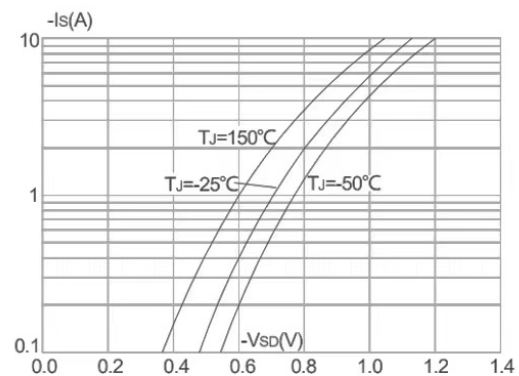


Figure 5: Gate Charge Characteristics

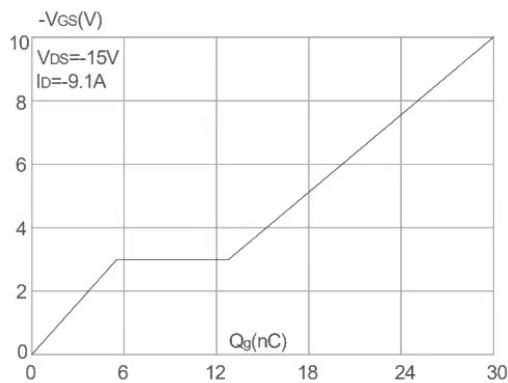


Figure 6: Capacitance Characteristics

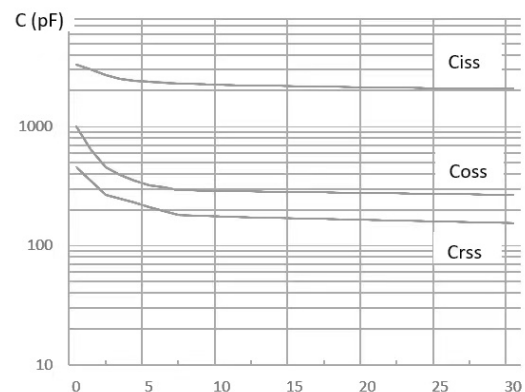


Figure 7: Normalized Breakdown Voltage
vs. Junction Temperature

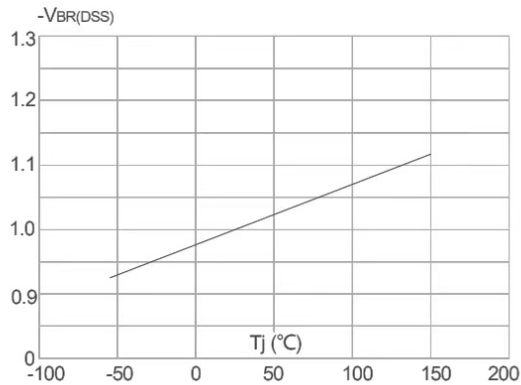


Figure 8: Normalized on Resistance
vs. Junction Temperature

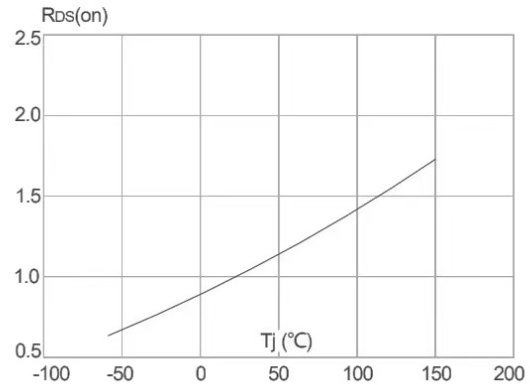


Figure 9: Maximum Safe Operating Area

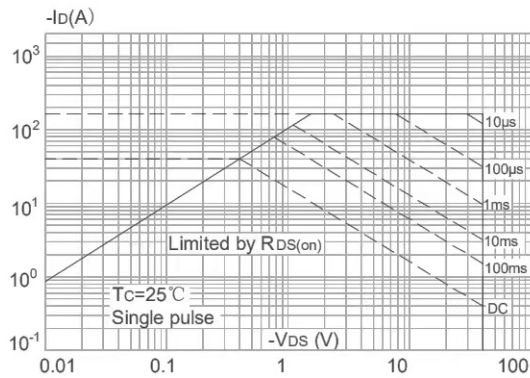


Figure 10: Maximum Continuous Drain Current
vs. Case Temperature

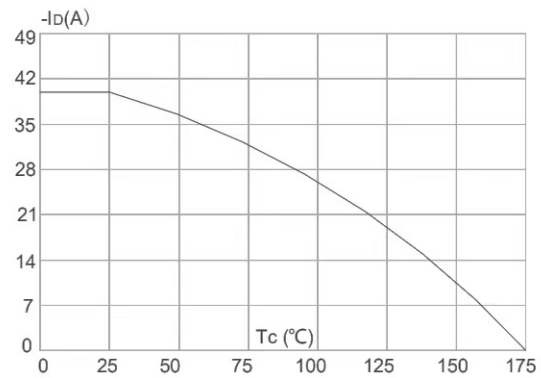
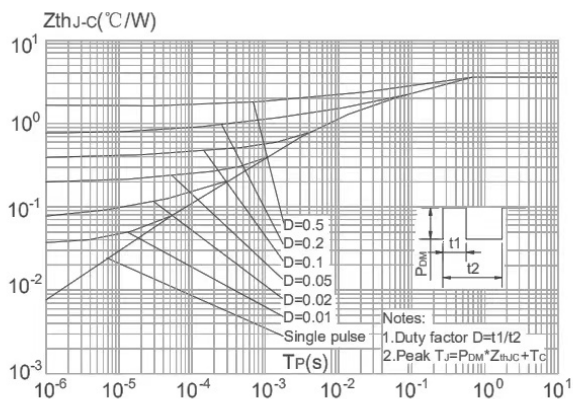
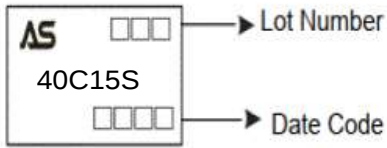


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to- Case

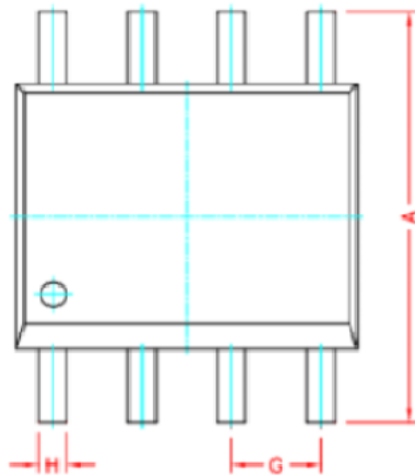


Ordering and Marking Information

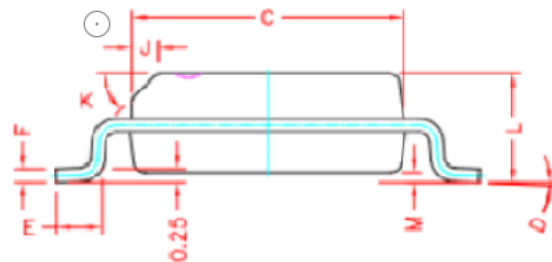
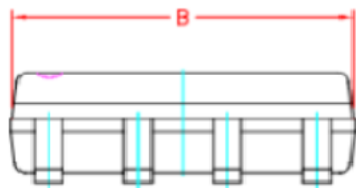
Ordering Device No.	Marking	Package	Packing	Quantity
ASDM40C15S-R	40C15S	SOP-8	Tape&Reel	4000/Reel

PACKAGE	MARKING
SOP-8	 The diagram shows a rectangular SOP-8 package with the following markings: - Top left: AS (Ascend Semiconductor logo) - Top right: □□□ (three empty boxes) with an arrow pointing to Lot Number - Center: 40C15S - Bottom right: □□□□ (four empty boxes) with an arrow pointing to Date Code

SOP-8



REF	DIMENSIONS	
	Millimeters	
	Min	Max
A	5.80	6.20
B	4.80	5.10
C	3.80	4.00
D	0°	8°
E	0.40	0.90
F	0.19	0.25
M	0.10	0.25
H	0.35	0.49
L	1.35	1.75
J	0.375 REF	
K	45°	
G	1.27 TYP	



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