

Features

- Dual N-Channel
- Enhancement mode
- Fast Switching
- High Effective

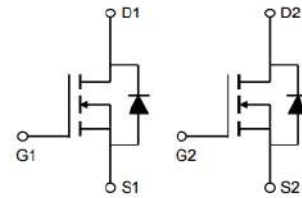
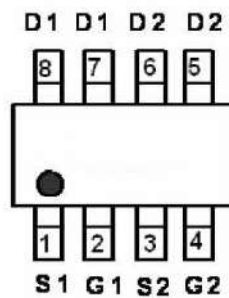
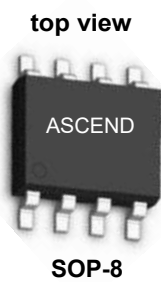
Applications

- Power Management in Inverter System
- Synchronous Rectification

Product Summary



V_{DS}	30	V
$R_{DS(on),max.}@V_{GS}=10V$	12.5	m Ω
I_D	12	A



Maximum ratings, at $T_A=25\text{ }^\circ\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage	30	V
I_S	Diode continuous forward current	$T_A=25\text{ }^\circ\text{C}$ 12	A
I_D	Continuous drain current @ $V_{GS}=10V$	$T_A=25\text{ }^\circ\text{C}$ 12	A
		$T_A=100\text{ }^\circ\text{C}$ 7.3	A
I_{DM}	Pulse drain current tested ①	$T_A=25\text{ }^\circ\text{C}$ 48	A
EAS	Avalanche energy, single pulsed ②	26	mJ
P_D	Maximum power dissipation	$T_A=25\text{ }^\circ\text{C}$ 2	W
V_{GS}	Gate-Source voltage	± 20	V
MSL		Level 3	
T_{STG}, T_J	Storage and junction temperature range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JL}$	Thermal Resistance, Junction-to-Lead	40	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	$^\circ\text{C/W}$

Typical Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _J =25°C)	V _{DS} =30V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _J =125°C)	V _{DS} =30V, V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.3	2.0	V
R _{DS(ON)}	Drain-Source On-State Resistance ③	V _{GS} =10V, I _D =10A	--	10.5	12.5	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ③	V _{GS} =4.5V, I _D =6A	--	13.5	16	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	780	1250	1500	pF
C _{oss}	Output Capacitance		100	210	250	pF
C _{riss}	Reverse Transfer Capacitance		70	150	200	pF
R _g	Gate Resistance	f=1MHz	--	3.5	--	Ω
Q _g	Total Gate Charge	V _{DS} =15V, I _D =10A, V _{GS} =10V	--	17	--	nC
Q _{gs}	Gate-Source Charge		--	3.8	--	nC
Q _{gd}	Gate-Drain Charge		--	4.8	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =15V, I _D =10A, R _G =3Ω, V _{GS} =10V	--	6.5	--	nS
t _r	Turn-on Rise Time		--	11.2	--	nS
t _{d(off)}	Turn-Off Delay Time		--	20.7	--	nS
t _f	Turn-Off Fall Time		--	5.3	--	nS
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =2A, V _{GS} =0V	--	0.8	1.2	V
t _{rr}	Reverse Recovery Time	T _J =25°C, I _{SD} =10A, V _{GS} =0V	--	20	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=500A/μs		11.5		nC

NOTE:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 8A, V_{GS} = 10V. Part not recommended for use above this value
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Performance Characteristics

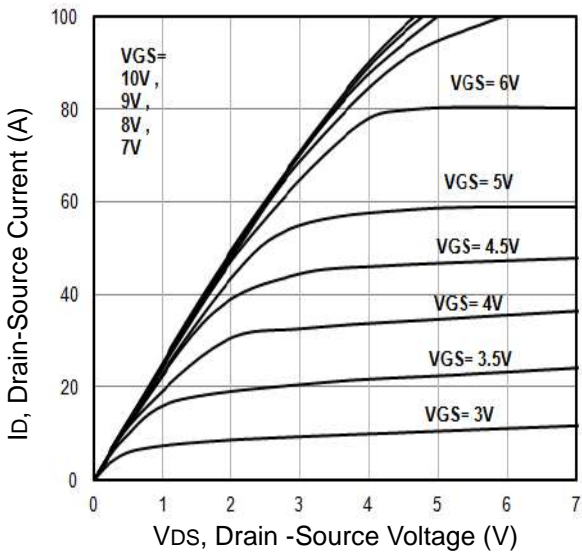


Fig1. Typical Output Characteristics

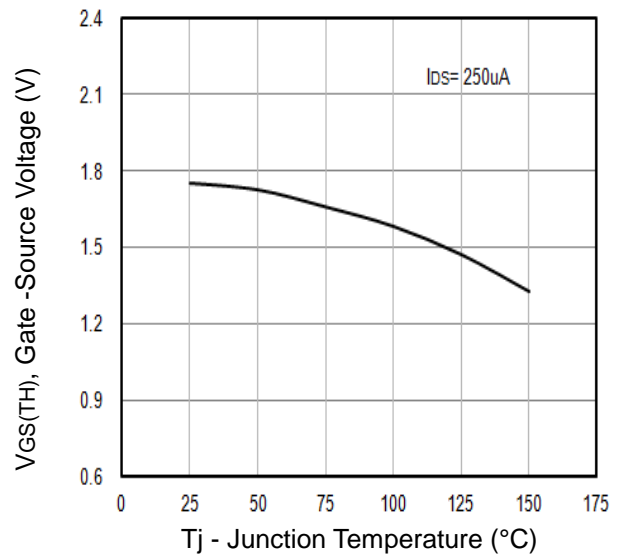


Fig2. Threshold Voltage Vs. Temperature

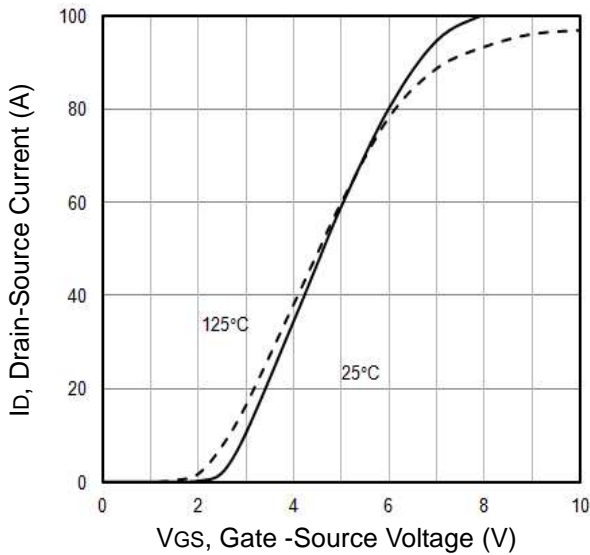


Fig3. Typical Transfer Characteristics

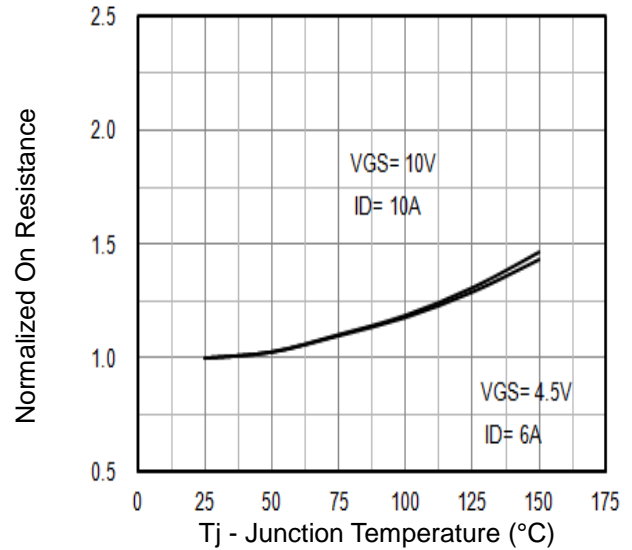


Fig4. Normalized On-Resistance Vs. Temperature

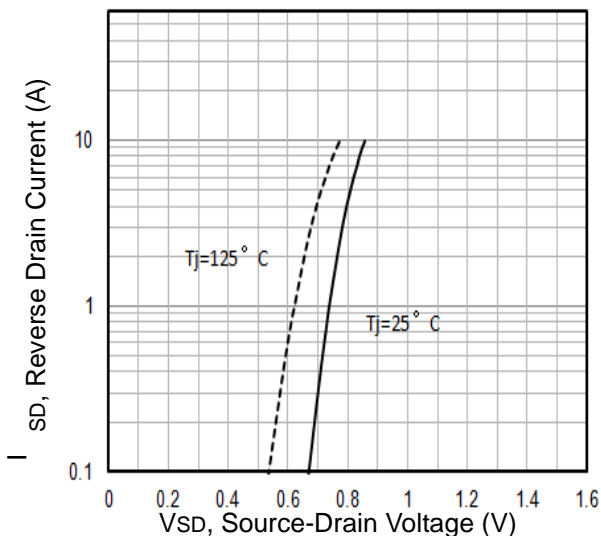


Fig5. Typical Source-Drain Diode Forward Voltage

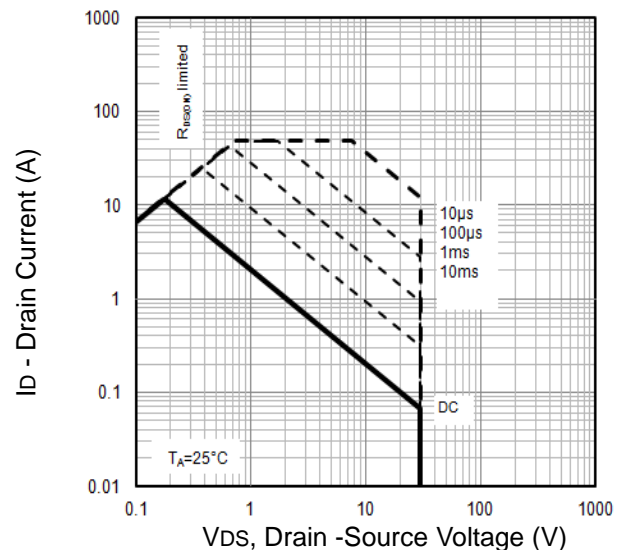


Fig6. Maximum Safe Operating Area

Typical Performance Characteristics

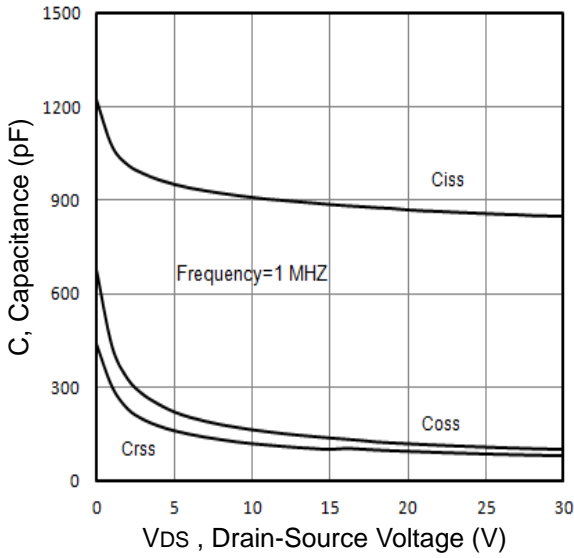


Fig7. Typical Capacitance Vs.Drain-Source Voltage

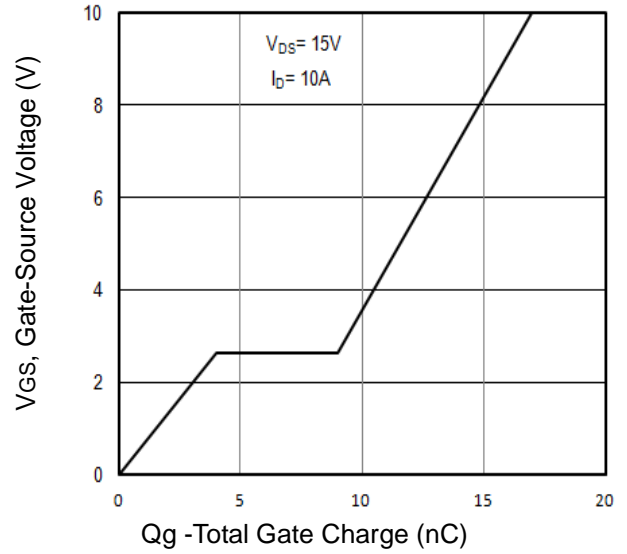


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

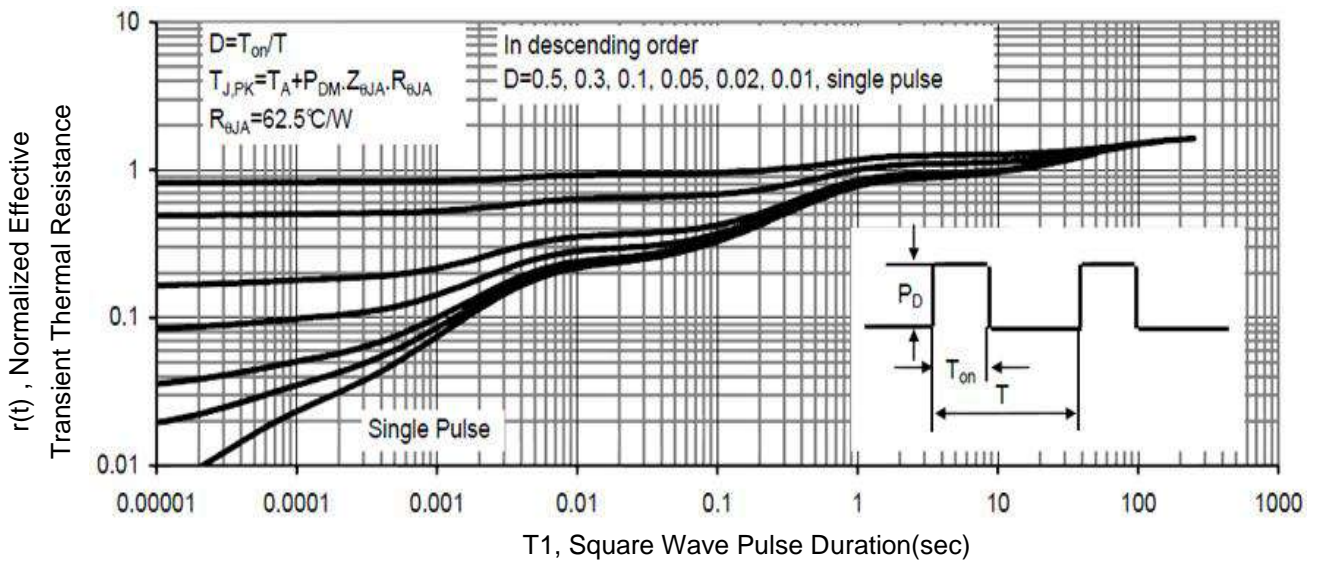


Fig9. T1 , Transient Thermal Response Curve

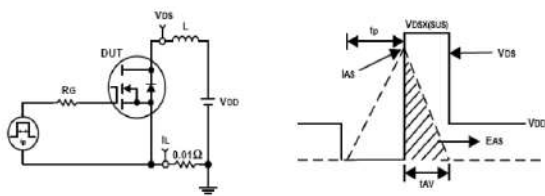


Fig10. Unclamped Inductive Test Circuit and waveforms

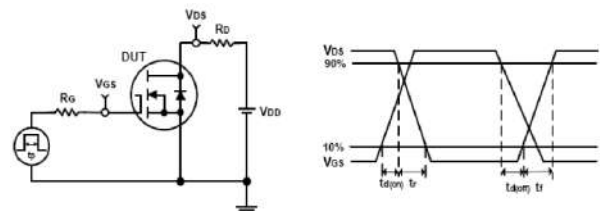
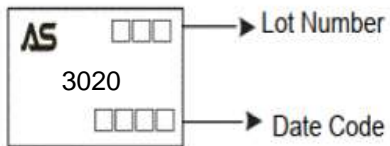


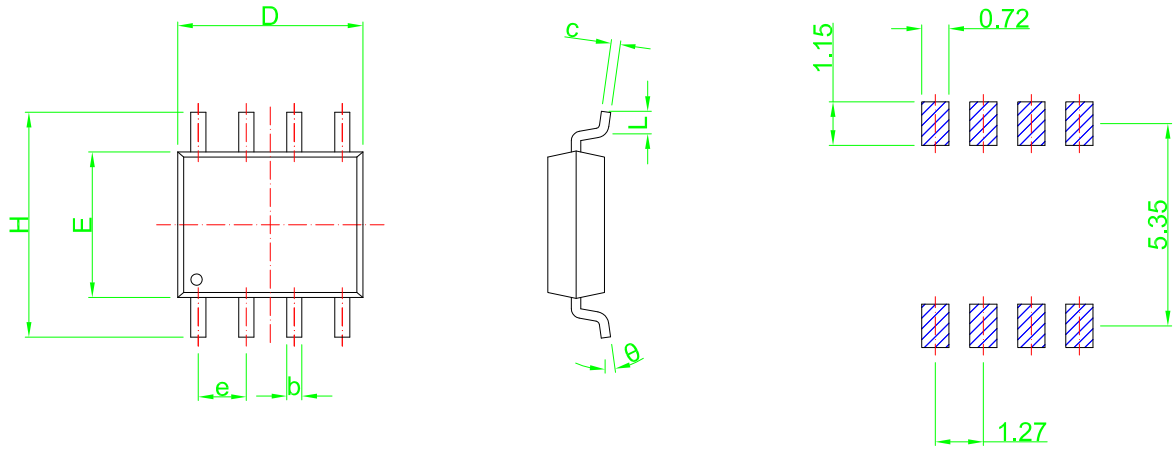
Fig11. Switching Time Test Circuit and waveforms

Ordering and Marking Information

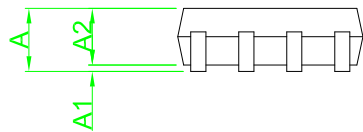
Ordering Device No.	Marking	Package	Packing	Quantity
ASDM3020S-R	3020	SOP8	Tape&Reel	4000/Reel

PACKAGE	MARKING
SOP8	 <p>The diagram shows a rectangular marking area on a component. It contains the letters 'AS' in the top left, the number '3020' in the center, and two sets of boxes for identification. The top set consists of three boxes, with an arrow pointing to the text 'Lot Number'. The bottom set consists of four boxes, with an arrow pointing to the text 'Date Code'.</p>

SOP-8 PACKAGE IN FORMATION



Recommended Land Pattern



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	---	1.75	---	0.069
A1	0.00	0.26	0.000	0.010
A2	1.30	1.70	0.051	0.067
b	0.30	0.55	0.012	0.022
C	0.15	0.35	0.006	0.014
D	4.80	5.00	0.189	0.197
E	3.80	4.00	0.150	0.157
e	1.27 TYP		0.050 TYP	
H	5.70	6.30	0.224	0.248
L	0.45	0.85	0.018	0.033
θ	0°	8°	0°	8°

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