

Features

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Optimized package with separate driver source pin
- Easy to parallel and simple to drive

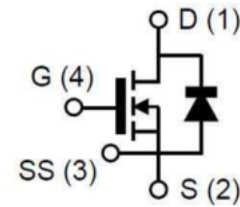
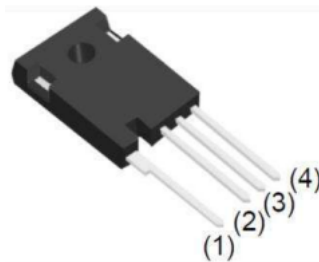


Product Summary

V_{DS}	1200	V
$R_{DS(on),Max} @ V_{GS}=20V$	100	m Ω
I_D	30	A

Applications

- EV motor drive
- High Voltage DC/DC Converters
- Switch Mode Power Supplies
- Power Factor Correction Modules



Absolute Maximum Ratings($T_c=25^\circ C$)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	1200	V
I_D	Drain Current(continuous)at $T_c=25^\circ C$	30	A
I_D	Drain Current(continuous)at $T_c=100^\circ C$	23	A
I_{DM}	Drain Current (pulsed)	75	A
V_{GS}	Gate-Source Voltage	-10/+22	V
P_D	Power Dissipation $T_c = 25^\circ C$	145	W
T_J, T_{stg}	Junction and Storage Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Value.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.86	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	$^\circ C/W$

The values are based on the junction-to case thermal impedance which is measured with the device mounted to a large heat sink assuming maximum junction temperature of $T_j(max)=150^\circ C$

**Electrical Characteristics(T_J = 25°C unless otherwise specified)
Typical Performance-Static**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DS}	Drain-source Breakdown Voltage	I _D =250μA, V _{GS} =0V	1200			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =1200V, V _{GS} =0V, T _J =25°C			100	μA
I _{GSS}	Gate-body Leakage Current	V _{DS} =0V ; V _{GS} =-10 to 20V			250	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =5mA	2		4	V
V _{GS(on)}	Recommended turn-on Voltage	Static		20		V
V _{GS(off)}	Recommended turn-off Voltage			-5		V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} =20V, I _D =20A			100	mΩ
		V _{GS} =20V, I _D =20A T _J =150°C		122		mΩ

Typical Performance-Dynamic

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C _{iss}	Input Capacitance	V _{DS} =1000V, f=1MHz, V _{AC} =25mV		1590		pF
C _{oss}	Output Capacitance			63		pF
C _{rss}	Reverse Transfer Capacitance			3.9		pF
g _{fs}	Transconductance	V _{DS} =20V, I _D =20A		12		S
E _{oss}	C _{oss} Stored Energy	V _{DS} =1000V, f=1MHz		35.7		μJ
E _{on}	Turn-On Energy (Body Diode)	V _{DS} =800V, V _{GS} =-5/20V, I _D =20A, L=150μH		455		μJ
E _{off}	Turn-Off Energy (Body Diode)	T _J =150°C		111		μJ
Q _g	Total Gate Charge	V _{DS} =800V, V _{GS} =-5V/20V, I _D = 15 A		72		nC
Q _{gs}	Gate-source Charge			21		nC
Q _{gd}	Gate-Drain Charge			22		nC
R _{G(int)}	Internal Gate Resistance	f=1MHz, V _{AC} =25mV		3		Ω
t _{d(on)}	Turn-on Delay Time	V _{DS} =800V, V _{GS} =-5V/20V, I _D =20A, L=150 μ H R _{ext} =2.5Ω		42		ns
t _r	Rise Time			15		ns
t _{d(off)}	Turn-off Delay Time			36		ns
t _f	Fall Time			11		ns

Typical Performance-Reverse Diode(T_J = 25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{FSD}	Forward Voltage	V _{GS} =0V, I _F =10A, T _J =25°C		4.8	6	V
		V _{GS} =0V, I _F =10A, T _J =150°C		4.2	6	V
I _S	Continuous Diode Forward Current	V _{GS} =0V, T _C =25°C		25		A
t _{rr}	Reverse Recovery Time	V _{GS} =-5 V, I _F =20A,		36		nS
Q _{rr}	Reverse Recovery Charge	V _R =800 V, di/dt=900		297		nC
I _{rrm}	Peak Reverse Recovery Current	A/μs, T _J =150°C		15.5		A

Electrical Characteristics

Fig1. Output characteristics ($T_J = 25\text{ }^\circ\text{C}$)

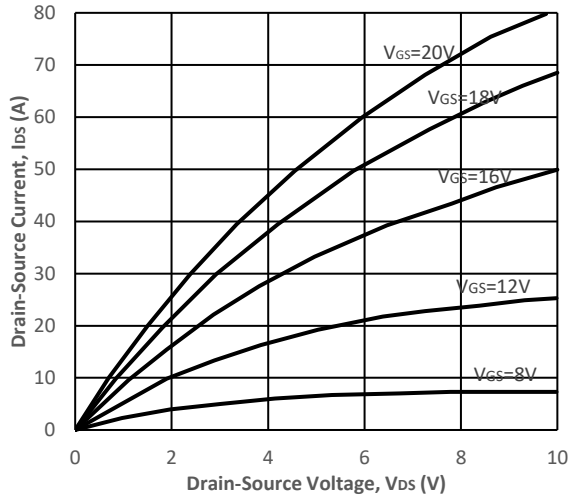


Fig2. Output characteristics ($T_J = 150\text{ }^\circ\text{C}$)

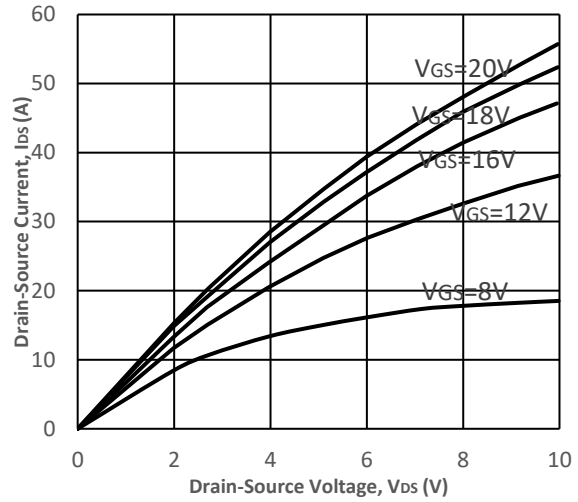


Fig3. Normalized On-Resistance vs. Temperature

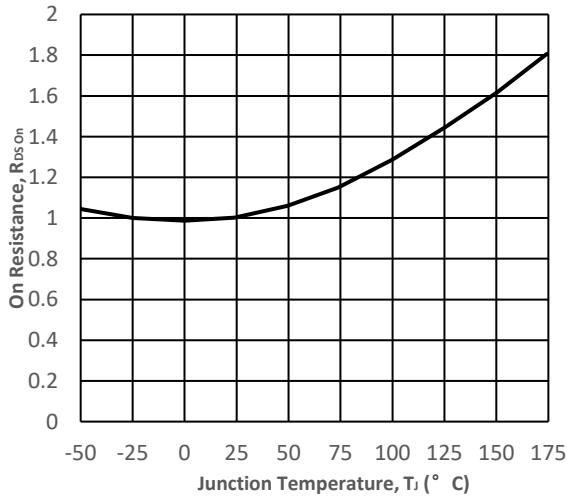


Fig4. On-Resistance vs. Temperature

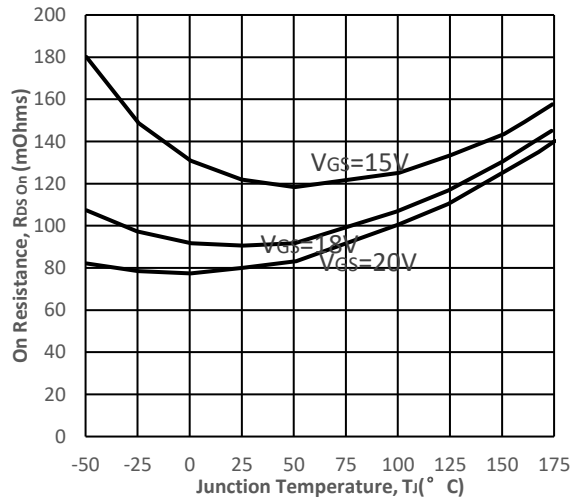


Fig5. Transfer Characteristic

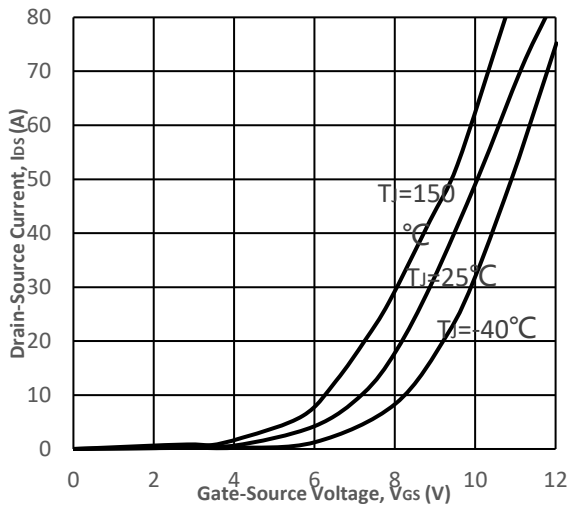


Fig6. Body Diode Characteristic at 25 °C

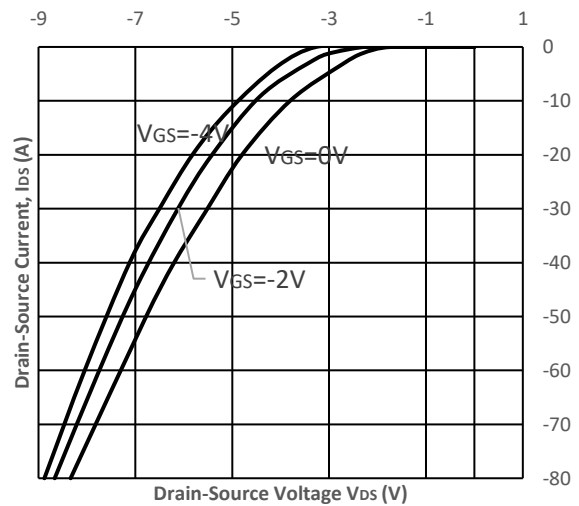


Fig7. Threshold Voltage vs. Temperature

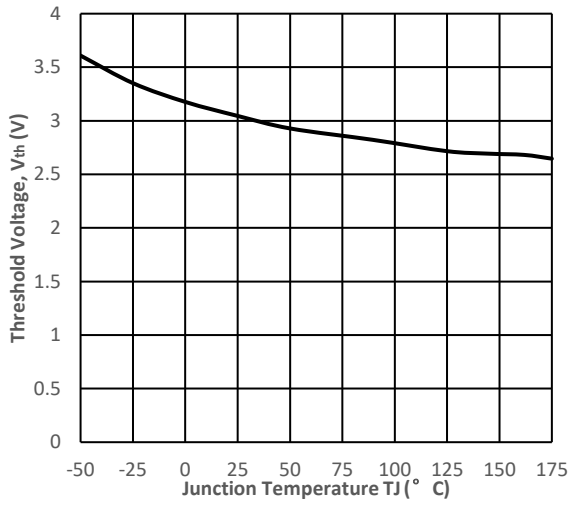


Fig8. Gate Charge Characteristics

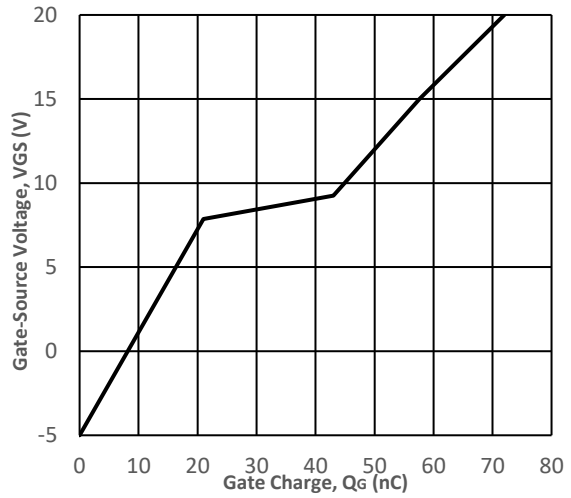


Fig9. 3rd Quadrant Characteristic at 25 °C

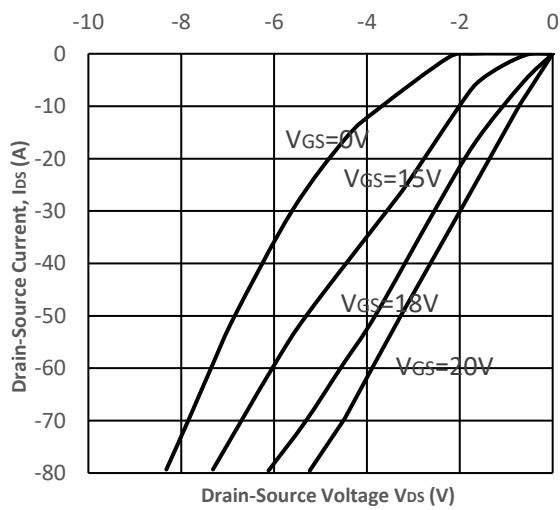


Fig10. Output Capacitor Stored Energy

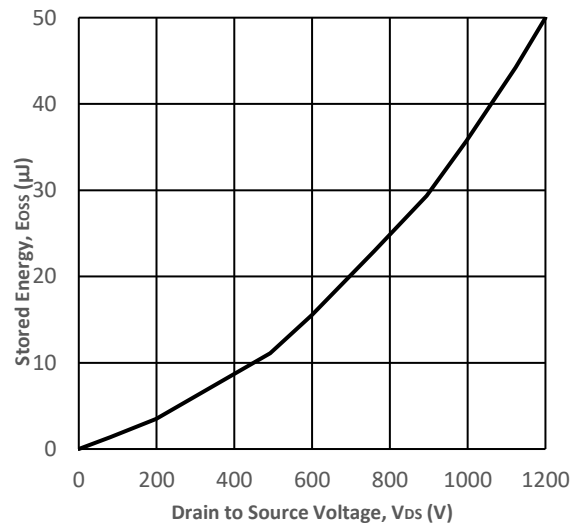


Fig11. Capacitances vs. Drain-Source

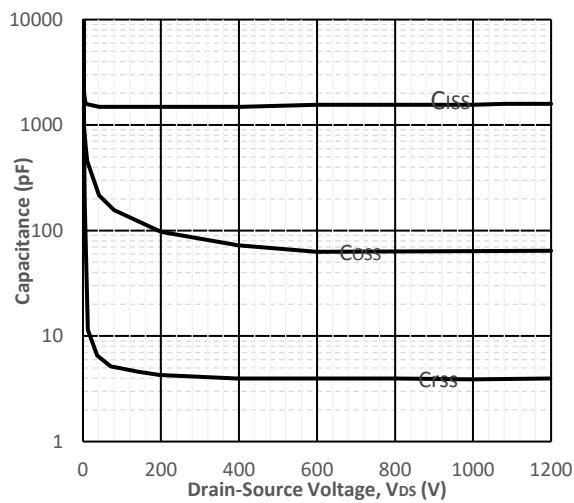


Fig12. Max Power Dissipation Derating Vs Tc

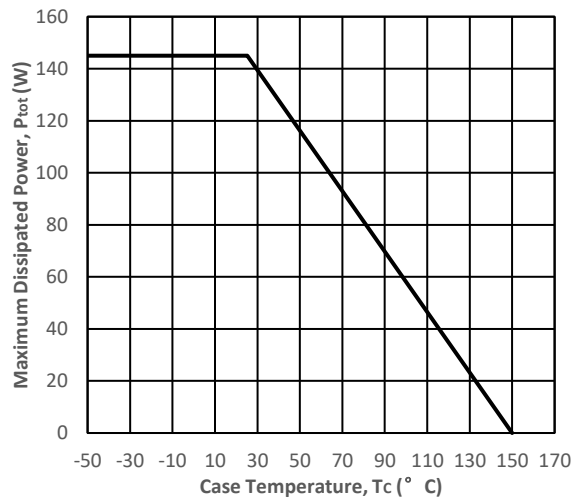


Fig13. Switching Energy vs. Drain Current

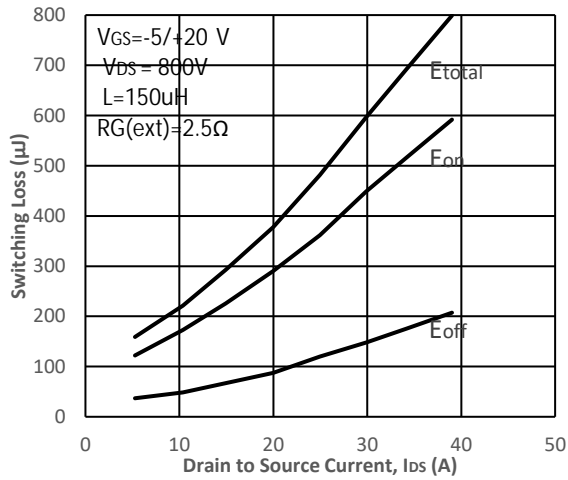


Fig14. Switching Energy vs. RG(ext)

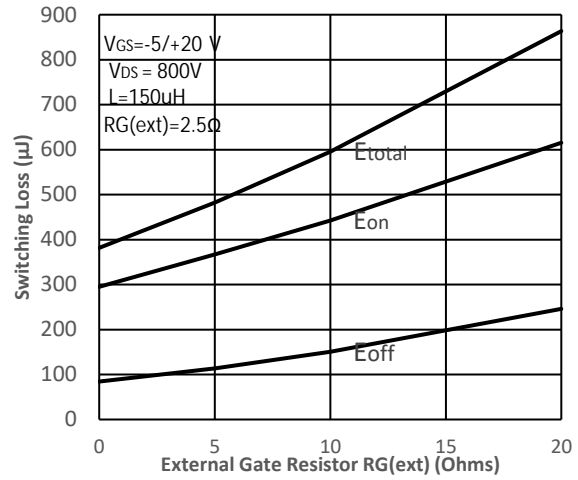


Fig15. Switching Energy vs. Temperature

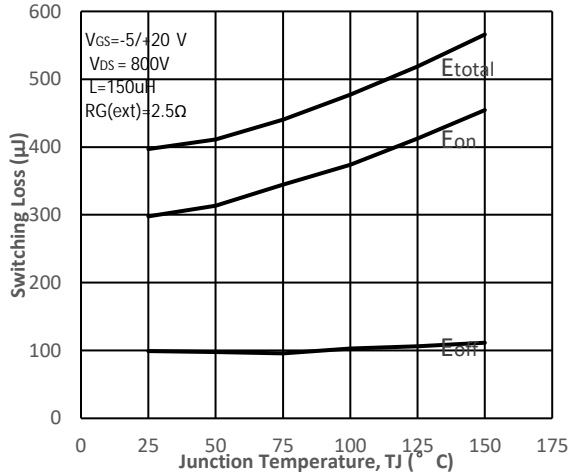


Fig16. Switching Times vs. RG(ext)

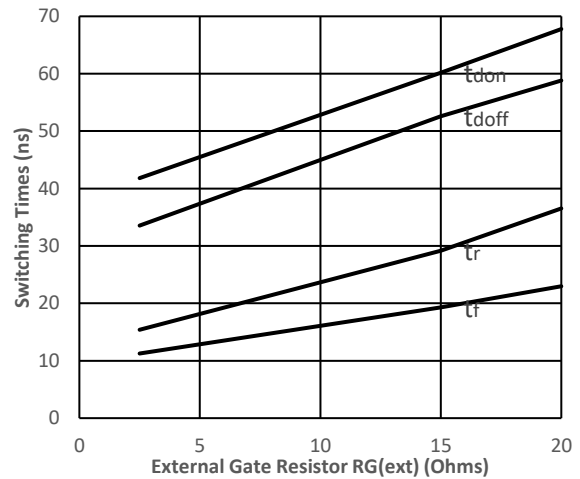


Fig17. Transient Thermal Impedance

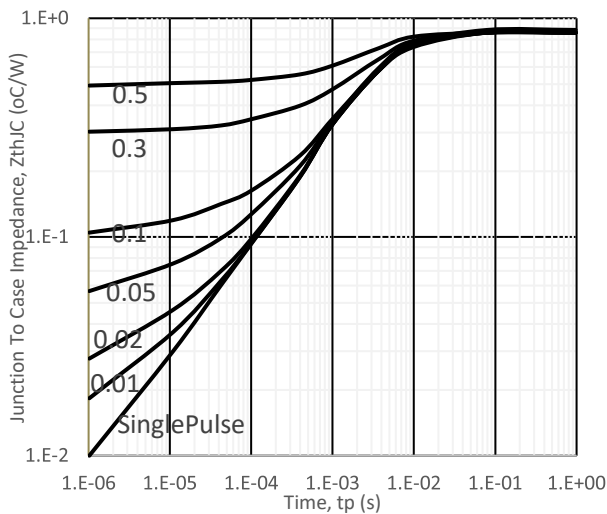
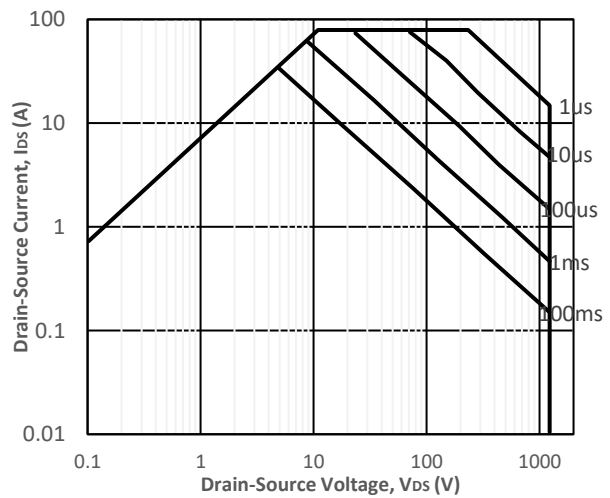
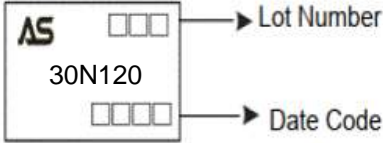


Fig18. Safe Operating Area



Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASCM30N120XD-T	30N120	TO-247-4	Tube	30/Tube

PACKAGE	MARKING
TO-247-4	 <p>AS □□□ → Lot Number 30N120 □□□□ → Date Code</p>

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