

FEATURES

| Advanced trench cell design

| MSL1

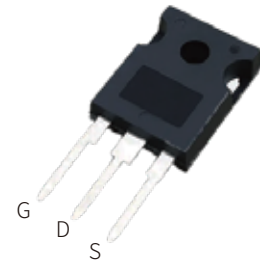
APPLICATION

| BMS

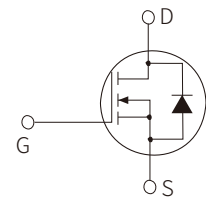
| Drones

| High power inverter system

| Light electric vehicles



TO-247



Schematic Symbol

APPROVALS

RoHS Compliance with 2011/65/EU

HF Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage $T_c=25^\circ\text{C}$	V_{DS}	100	V
Drain Current (Pulsed) $T_c=25^\circ\text{C}$ $V_{GS}=10\text{V}$	I_{DM}^*	1200	A
Drain Current (DC)	I_D	$T_c=25^\circ\text{C}$ $V_{GS}=10\text{V}$	A
		$T_c=100^\circ\text{C}$ $V_{GS}=10\text{V}$	A
Gate-Source Voltage $T_c=25^\circ\text{C}$	V_{GS}	± 20	V
Drain power dissipation $T_c=25^\circ\text{C}$	P_{tot}	286	W
Continuous-Source Current $T_c=25^\circ\text{C}$	I_S	280	A
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 to 150	$^\circ\text{C}$
Single Pulsed Avalanche Energy $V_{DD}=40\text{V}$, $L=0.1\text{mH}$	E_{AS}	1750	mJ
Thermal Resistance – Junction to Ambient	$R_{\theta JA}^{**}$	32.8	$^\circ\text{C/W}$
Thermal Resistance- Junction to Case	$R_{\theta JC}^{**}$	0.45	$^\circ\text{C/W}$

Notes:

* Pulse width $\leq 300\text{ us}$, duty cycle $\leq 2\%$

** Surface Mounted on minimum footprint pad area.

*** Limited by bonding wire

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_{DS}=250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2		4	V
Drain Leakage Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$			1	μA
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
On-State Resistance	$R_{DS(on)}^a$	$V_{GS}=10V, I_{DS}=20A$			2.3	m Ω
Diode Characteristics						
Diode Forward Voltage	V_{SD}^a	$I_{SD}=20A, V_{GS}=0V$			1.3	V
Reverse Recovery Time	t_{rr}	$I_{DS}=20A, V_{GS}=0V$ $dI_{SD}/dt=100A/\mu s$		80		nS
Reverse Recovery Charge	Q_{rr}			195		nC
Diode Characteristics ^b						
Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=50V,$ Frequency = 1 MHz		9200		pF
Output capacitance	C_{oss}			1130		pF
Reverse transfer capacitance	C_{rss}			110		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=50V, V_{GEN}=10V$ $R_G=4.5\Omega, R_L=2.5\Omega,$ $I_{DS}=20A$		32		nS
Turn-on Rise Time	t_r			40		nS
Turn-Off Delay Time	$t_{d(off)}$			80		nS
Turn-Off Fall Time	t_f			35		nS
Gate Charge Characteristics ^b						
Total Gate Charge	Q_g	$V_{DS}=50V, V_{GS}=10V, I_{DS}=20A$		131		nC
Gate-Source Charge	Q_{gs}			50		nC
Gate-Drain Charge	Q_{gd}			24.5		nC

Notes:

a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

b : Guaranteed by design, not subject to production testing

PARAMETER CHARACTERISTIC CURVE

Figure1: Power Capability

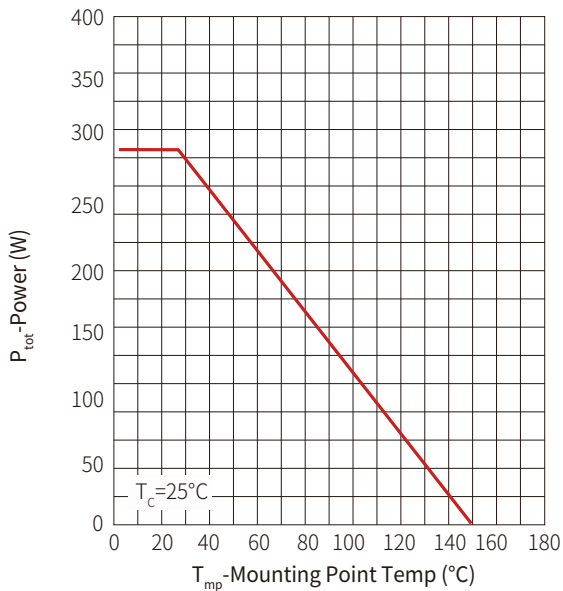


Figure2: Current Capability

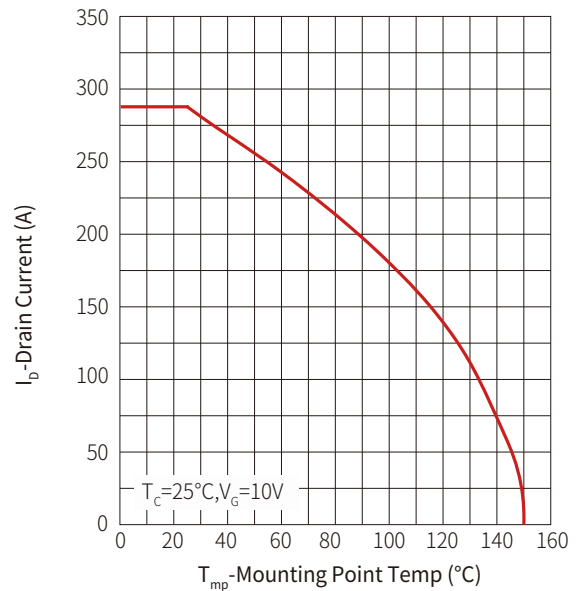


Figure3: Safe Operation Area

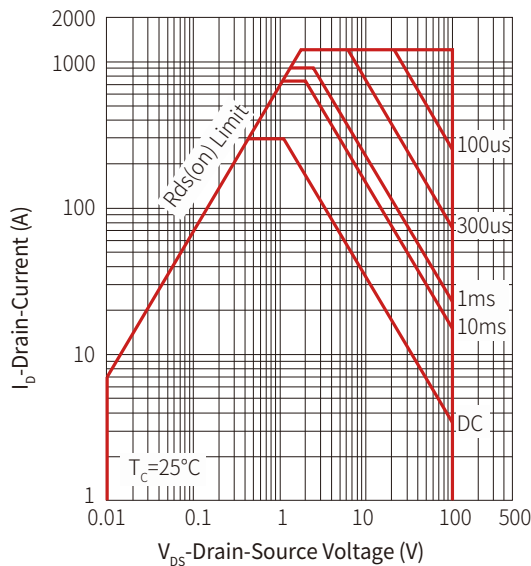


Figure 4: Transient Thermal Impedance

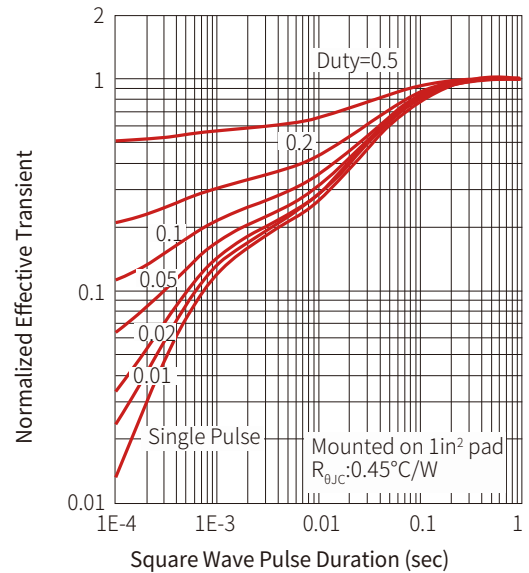


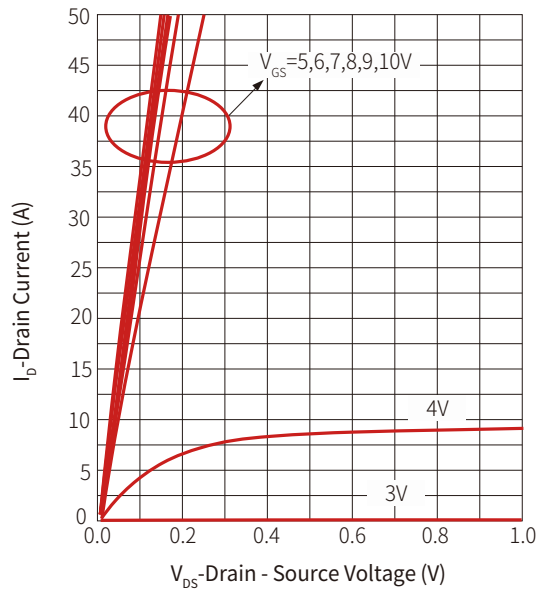
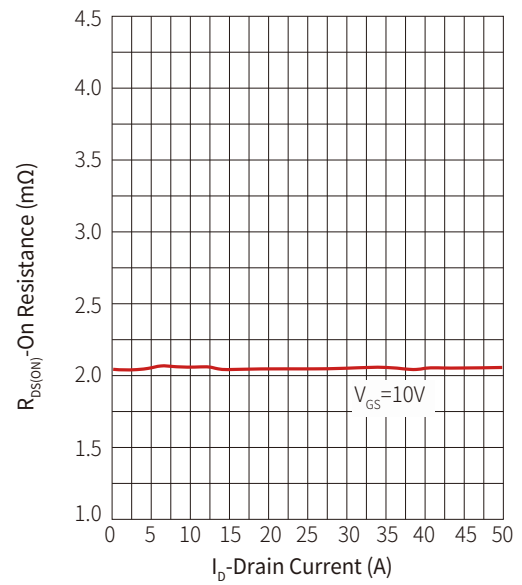
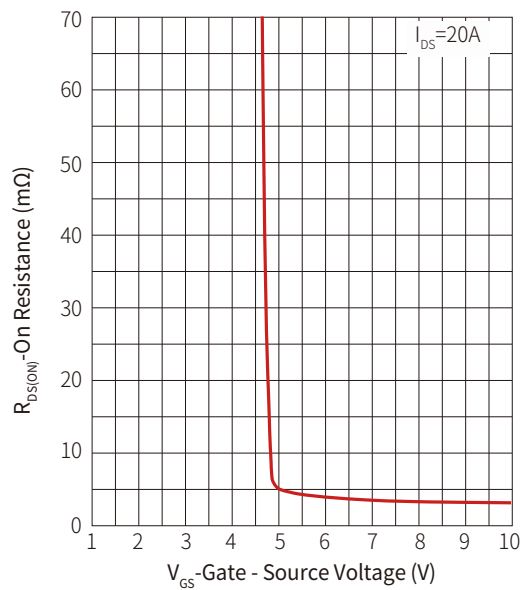
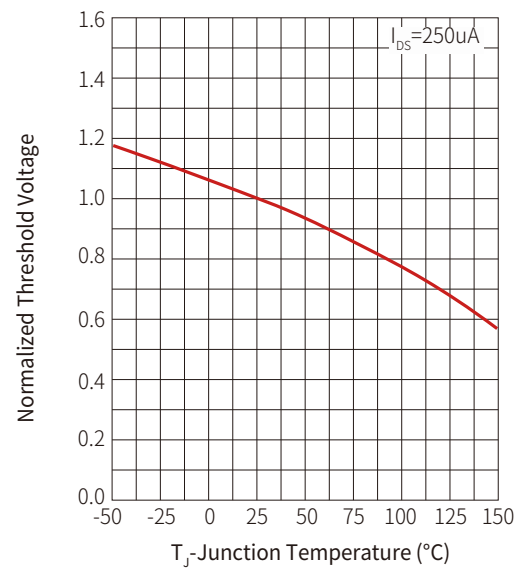
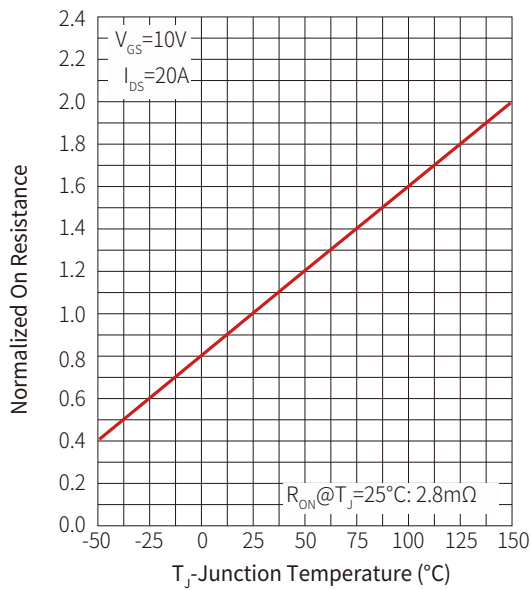
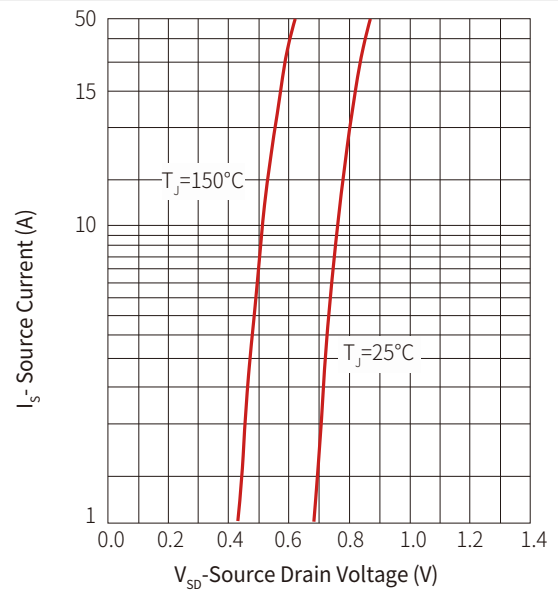
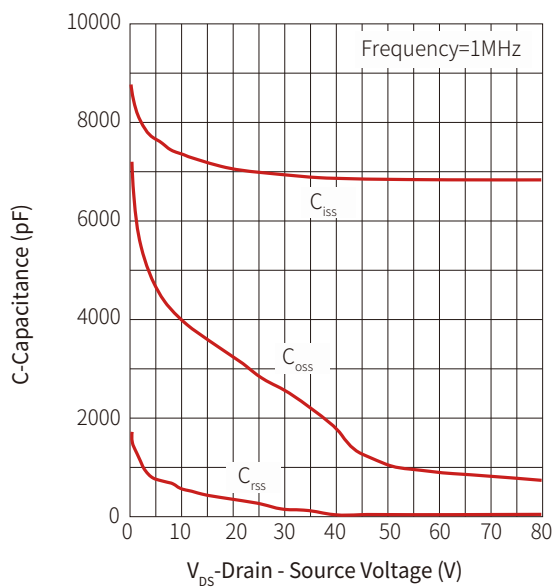
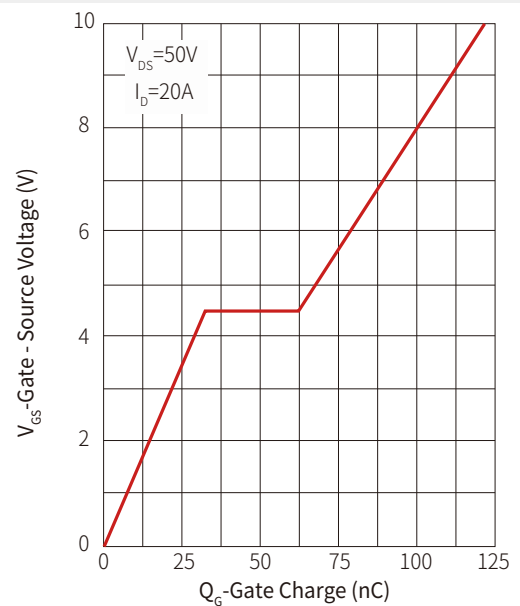
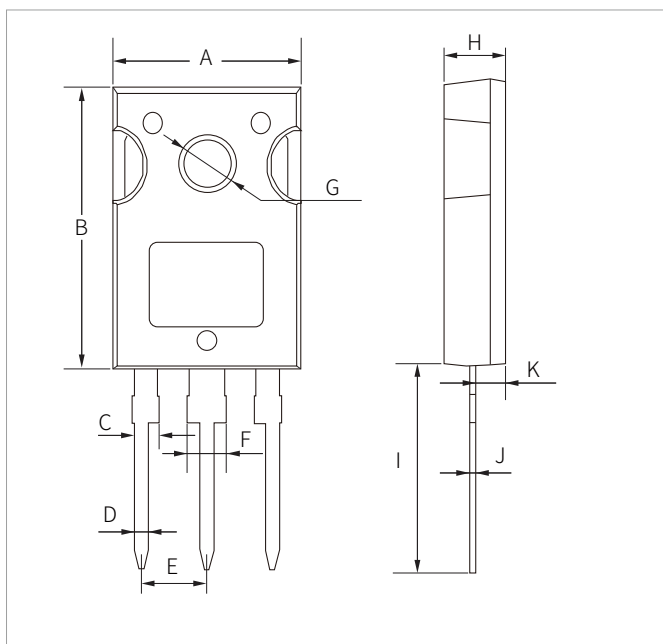
Figure 5: Output Characteristics

Figure 6: On Resistance

Figure 7: Transfer Characteristics

Figure 8: Normalized Threshold Voltage


Figure 9: Normalized On Resistance

Figure 10: Diode Forward Current

Figure 11: Capacitance

Figure 12: Gate Charge


TO-247 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	15.4	15.8	0.606	0.662
B	19.5	20.5	0.767	0.807
C	1.8	2.2	0.070	0.087
D	1.15	1.25	0.045	0.050
E	5.2	5.7	0.204	0.225
F	2.8	3.2	0.110	0.126
G	3.4	3.8	0.133	0.149
H	4.8	5.2	0.188	0.205
I	14.0	14.5	0.550	0.570
J	0.4	0.7	0.015	0.029
K	2.4		0.095	

ORDERING INFORMATION

Part Number	Component Package	Marking	QTY/Tube	QTY/Box	QTY/Carton
SNM023N10P	TO-247	023N10 AYWW01 XXXXXX	30PCS	600PCS	3000PCS

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