T2M350120E

SiC N-MOSFET 1200V, 350mΩ, 9.8A

Features

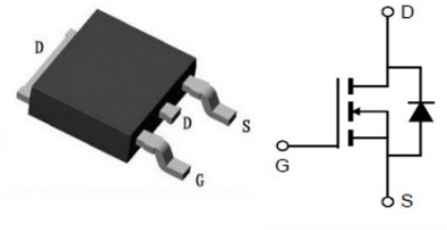
- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Avalanche Ruggednes

Product Summary

V_{DS}	1200V
$R_{DS(on)\_typ}$	350mΩ
I_D	9.8A

Applications

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC-DC Converters
- Batterry Chargers



RoHS

Halogen Free

Package Marking and Ordering Information

Part #	Marking	Package
T2M350120E	2M350120E	TO-252

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	1200	V
Continuous drain current T_C = 25°C , V_{GS} = 18V T_C = 125°C, V_{GS} = 18V	I_D	 9.8 5.6	A
Source current(Body Diode) T_C = 25°C , V_{GS} = -4V T_C = 125°C, V_{GS} = -4V	I_S	 9.8 5.6	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	I_{DM}	25	A
Avalanche energy, single pulse (L=10mH)	E_{AS}	80	mJ
Gate-Source voltage	V_{GS}	-4/+18	V
Gate-Source voltage（Absolute maximum values）	V_{GSmax}	-8/+22	V
Power dissipation (T_C = 25°C)	P_{tot}	60	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+175	°C

●Example of acceptable V_{GS} waveform

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal resistance, junction – case. Max	R_{thJC}	2.50	°C/W
Thermal resistance, junction – ambient. Max	R_{thJA}	40	

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	$V_{(BR)DSS}$	1200	-	-	V	V_{GS}=0V, I_D=100uA
Gate threshold voltage	$V_{GS(th)}$	2	3	4	V	V_{DS}=V_{GS},I_D=1mA
Zero gate voltage drain current	I_{DSS}	- -	1 5	5 -	μA	V_{DS}=1200V,V_{GS}=0V T_C=25°C T_C=175°C
Gate-source leakage current	I_{GSS}	-		100	nA	V_{GS}=18V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	350 550	430 -	mΩ	V_{GS}=18V, I_D=3.5A, T_J=25°C T_J=175°C
Drain-source on-state resistance	$R_{DS(on)}$	- -	380 610	430 -	mΩ	V_{GS}=15V, I_D=3.5A, T_J=25°C T_J=175°C
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	294.1	-	pF	V_{DS} = 1000V V_{GS} = 0V T_J = 25°C V_{AC}=25mV f = 1MHz
Output Capacitance	C_{oss}	-	14.5	-		
Reverse Transfer Capacitance	C_{rss}	-	3.3	-		
Gate Total Charge	Q_G	-	13.8	-	nC	V_{DS} = 800V V_{GS} = 0/+18V I_D = 3.5A I_G=10mA
Gate-Source charge	Q_{gs}	-	1.76	-		
Gate-Drain charge	Q_{gd}	-	7.36	-		
Turn-On Switching Energy	E_{ON}	-	52.1	-	uJ	V_{DD} = 800V V_{GS} = -4/+18V I_D = 3.5A R_G = 5Ω L = 1mH T_J = 25°C
Turn-Off Switching Energy	E_{OFF}	-	12.62	-		
Turn-on delay time	$t_{d(on)}$	-	4.2	-	ns	
Rise time	t_r	-	2	-		
Turn-off delay time	$t_{d(off)}$	-	10.2	-		
Fall time	t_f	-	9.8	-		
Gate resistance	R_G	-	3.0	-	Ω	V_{AC} = 25mV, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}		4.2		V	V_{GS}=-4V,I_{SD}=1.7A, T_J=25°C
			3.8			V_{GS}=-4V,I_{SD}=1.7A, T_J=175°C
Reverse Recovery Time	t_{rr}	-	22.2	-	ns	V_R = 800V I_D = 3.5A di/dt = 1000A/μS V_{GS}= -4V T_J = 25°C
Reverse Recovery Charge	Q_{rr}	-	36	-	nC	
Reverse Recovery Energy	E_{REC}	-	14.74	-	uJ	
Peak Reverse Recovery Current	I_{rrm}	-	2.67	-	A	
Charge Time	t_A	-	10.8	-	ns	
DisCharge Time	t_B	-	11.4	-	ns	

Typical Performance Characteristics

Fig 1. Output Characteristic (T_J=-55℃)

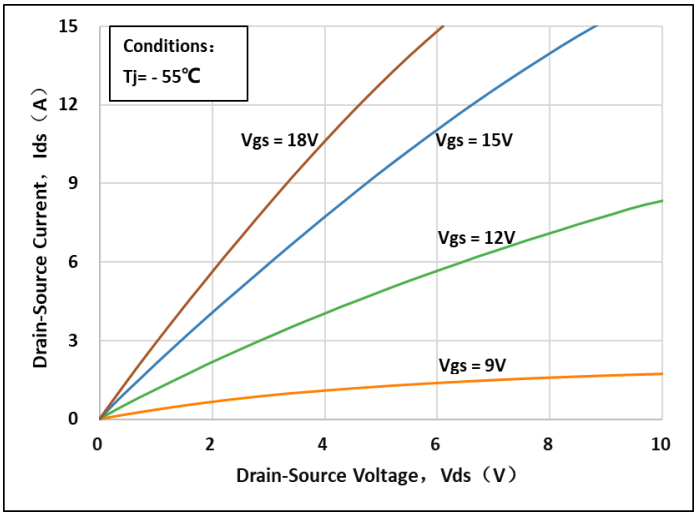


Fig 2. Output Characteristic (T_J=25℃)

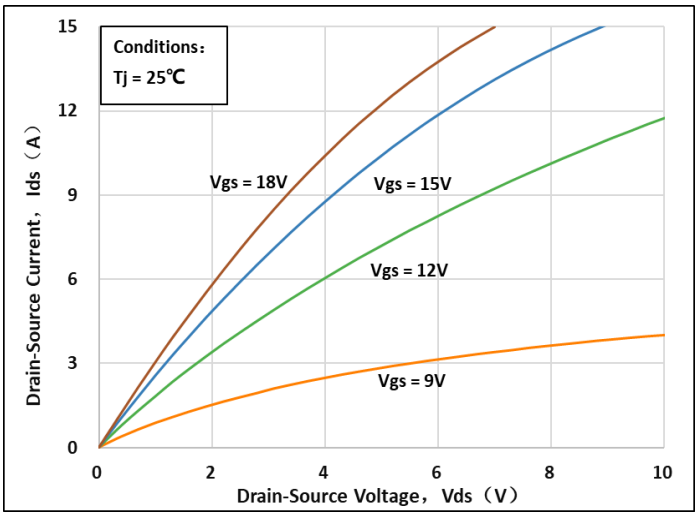


Fig 3. Output Characteristic (T_J=175℃)

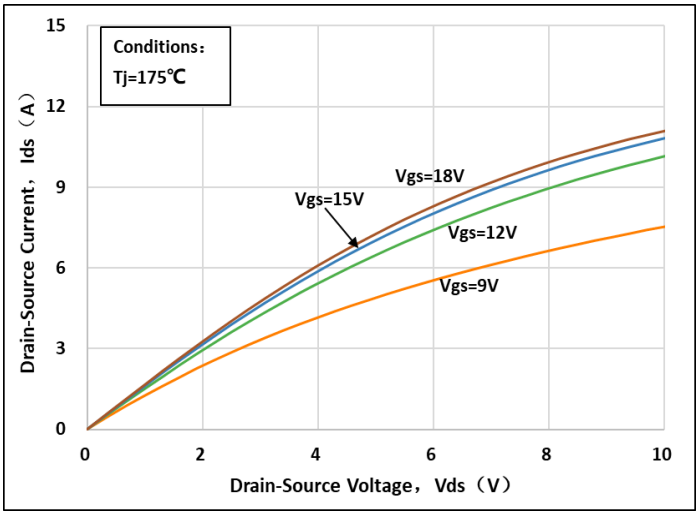


Fig 4: Rdson Vs Ids Characteristic

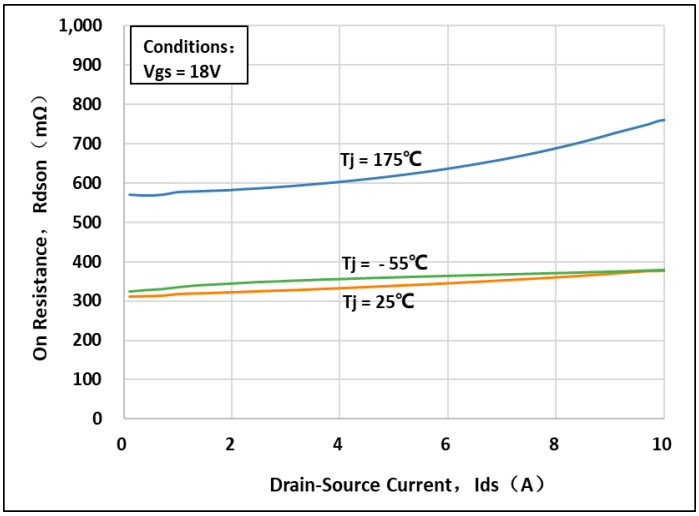


Fig 5: Rds(on) vs. Temperature

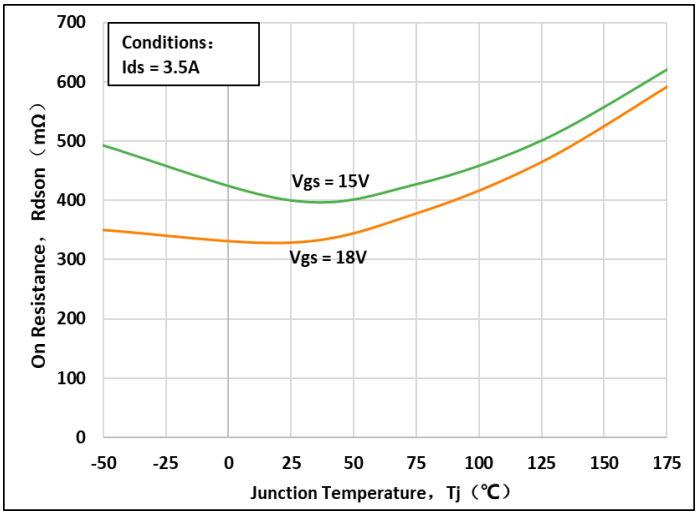


Fig 6: Transfer Characteristic

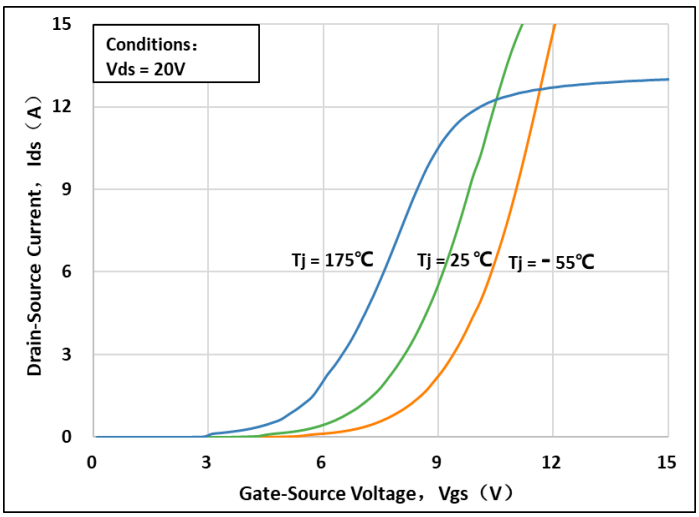


Fig 7: Body-diode Characteristic (T_J=-55℃)

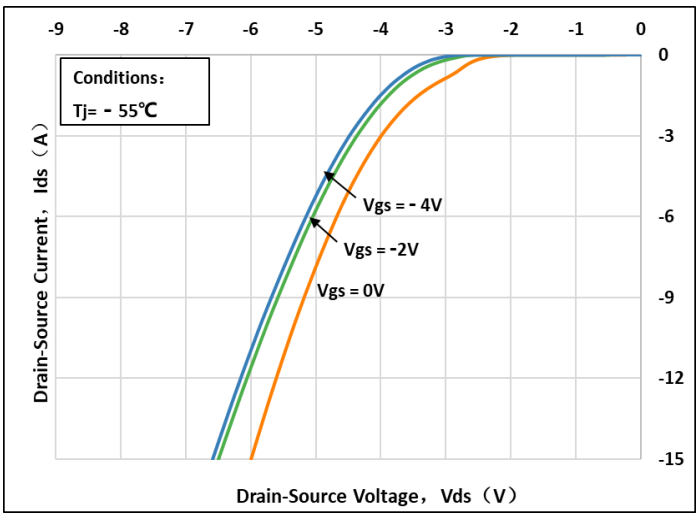


Fig 8: Body-diode Characteristic (T_J=25℃)

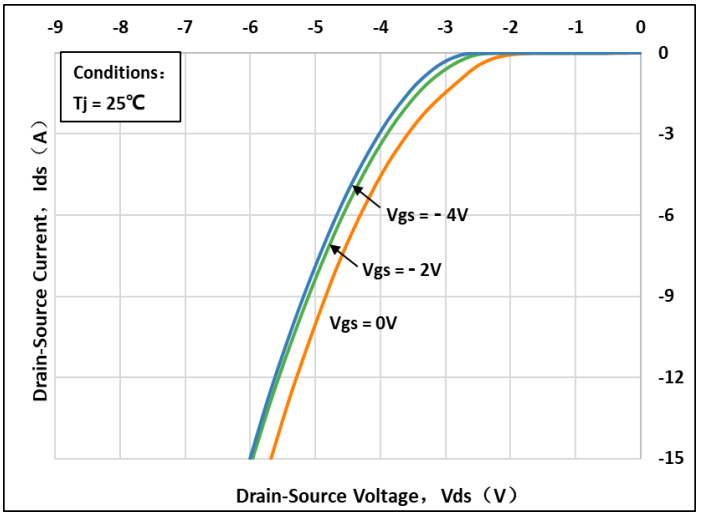


Fig 9: Body-diode Characteristic (T_J=175℃)

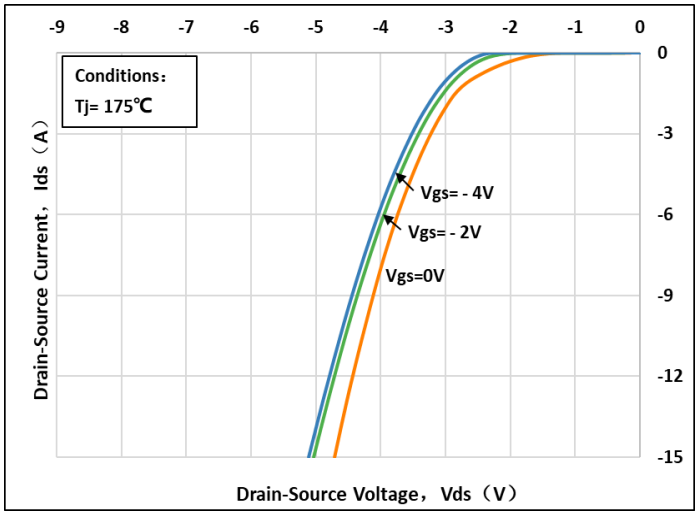


Fig 10: V_{TH} Vs T_J Temperature Characteristic

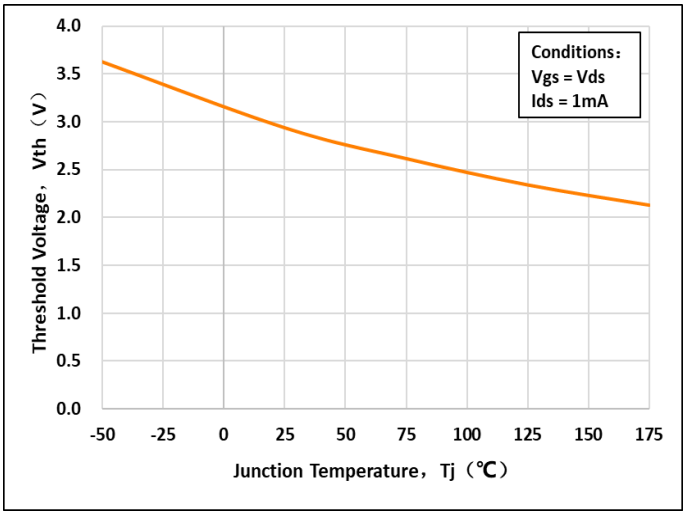


Fig 11: 3rd Quadrant Characteristic(T_J=-55℃)

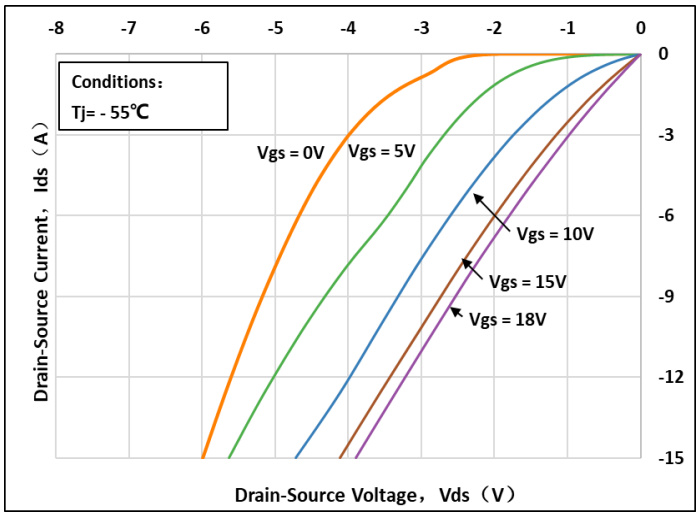


Fig 12: 3rd Quadrant Characteristic(T_J=25℃)

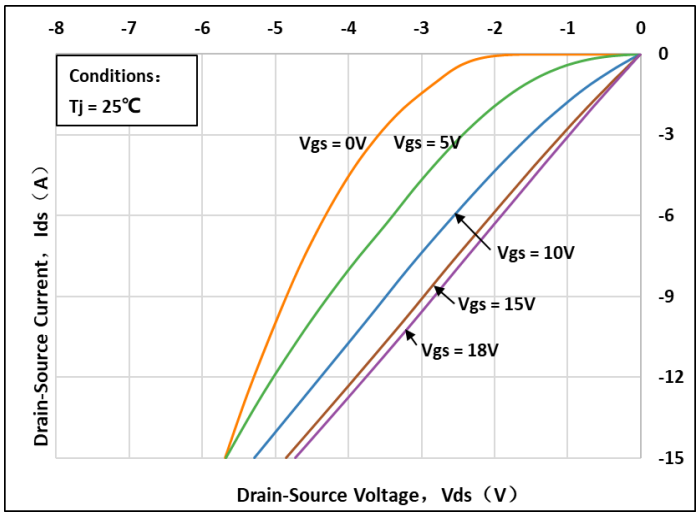


Fig 13: 3rd Quadrant Characteristic(T_J=175℃)

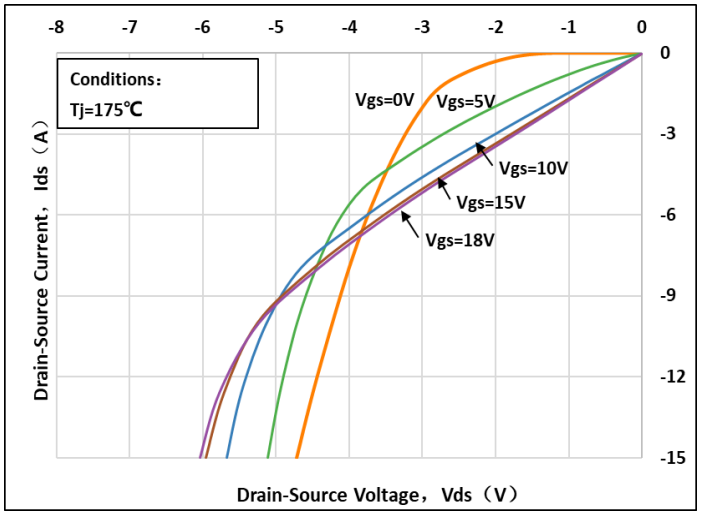


Fig 14: Gate Charge Characteristics

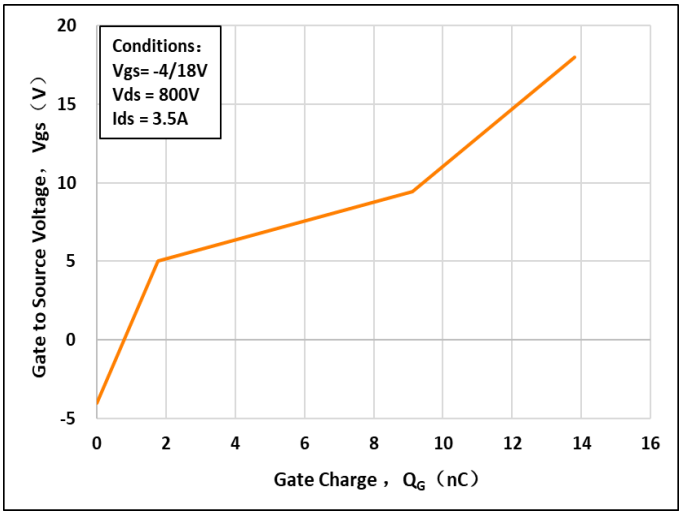


Fig 15: Drain Current vs.Case Temperature

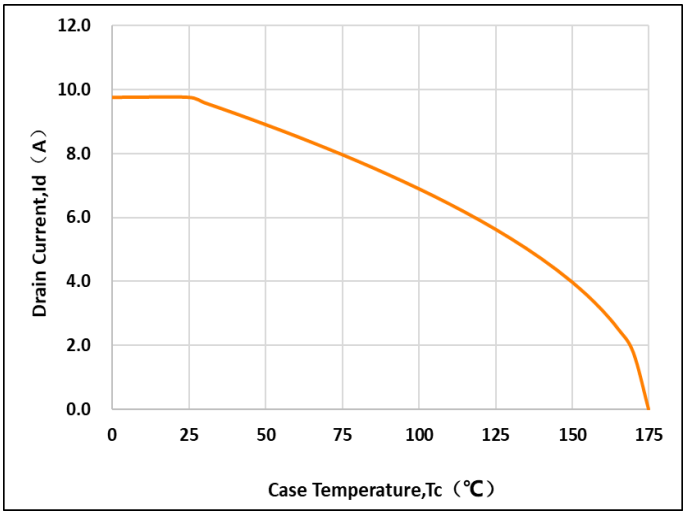


Fig 16: Safe Operating Area

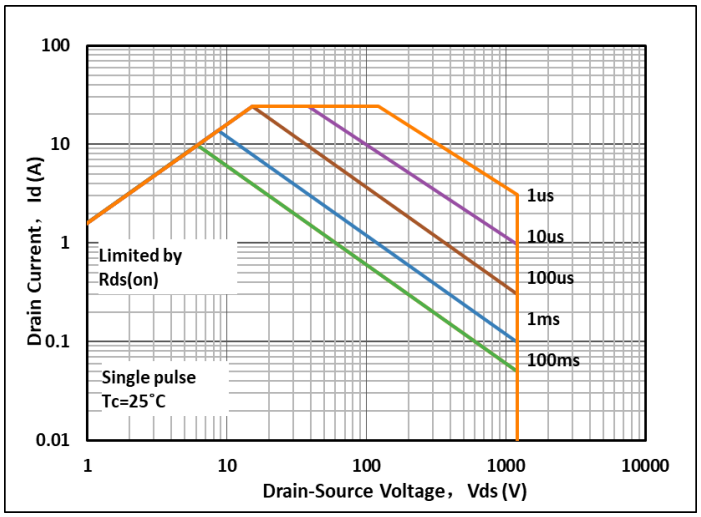


Fig 17: Capacitance Characteristics

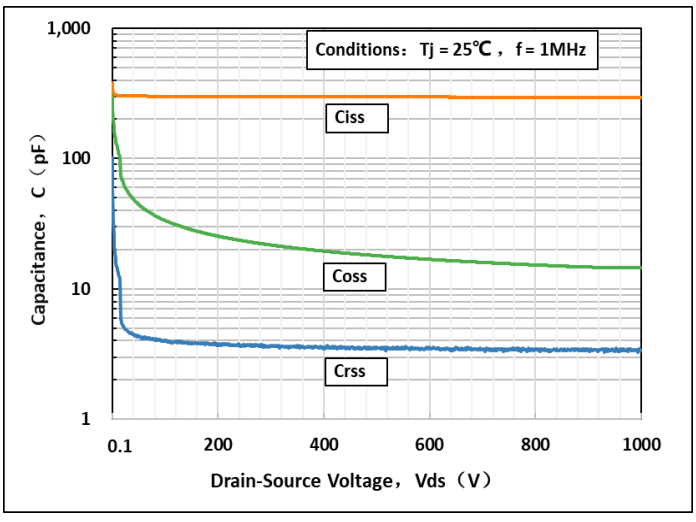
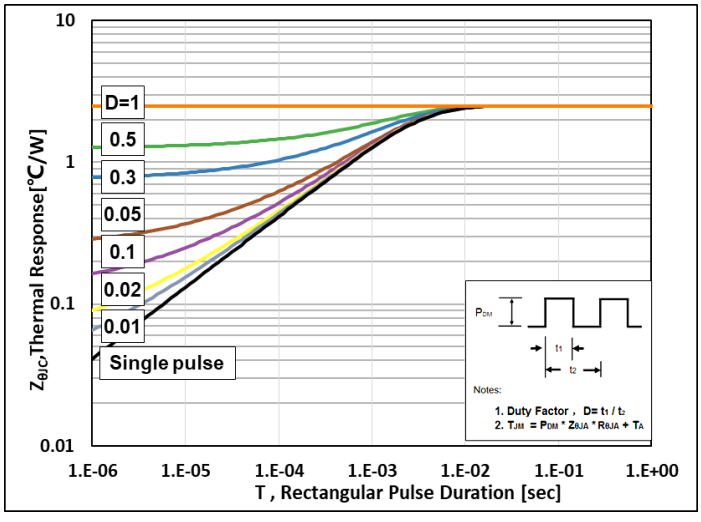
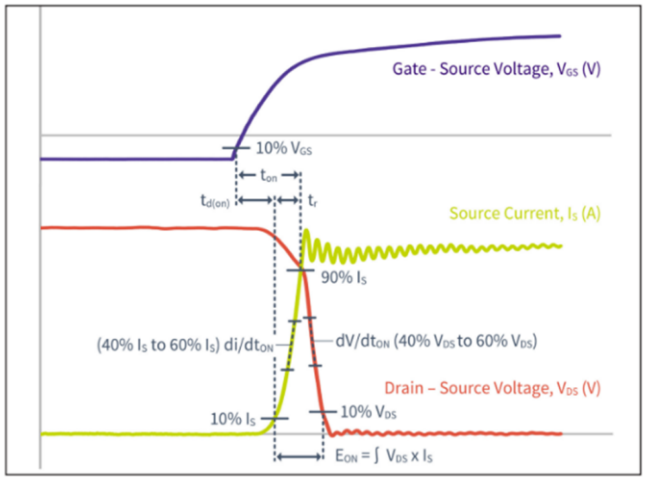


Fig 18: Transient Thermal Impedance

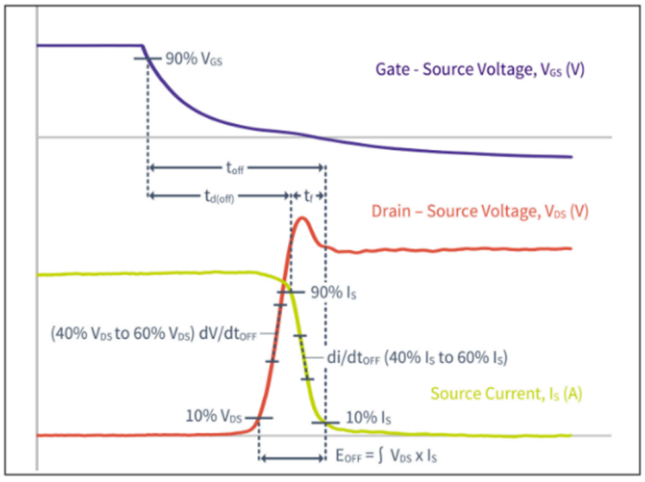


Test Circuit & Waveform

Figure A. Definition of switching times



Turn-on Transient Definitions



Turn-off Transient Definitions

Figure B. Dynamic test circuit

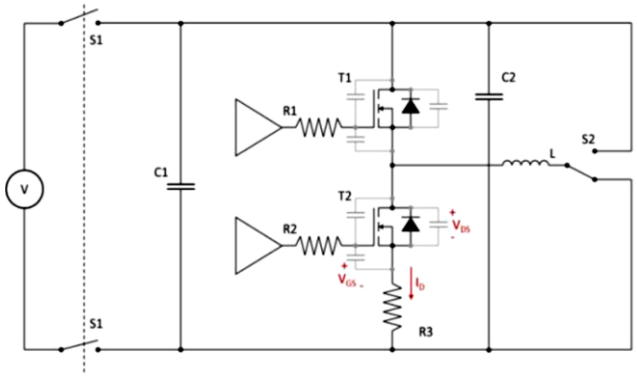
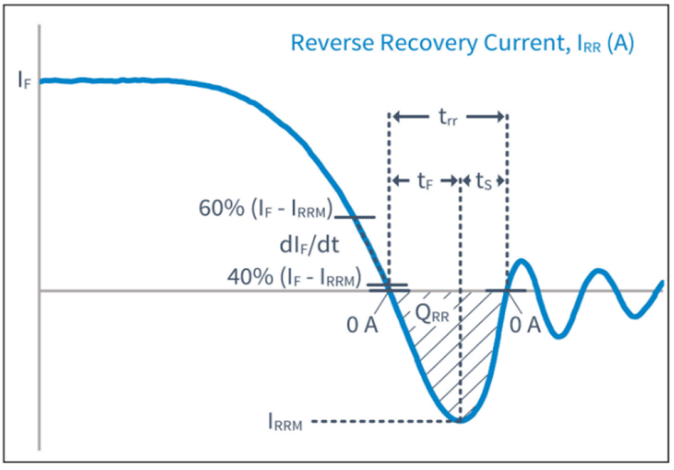
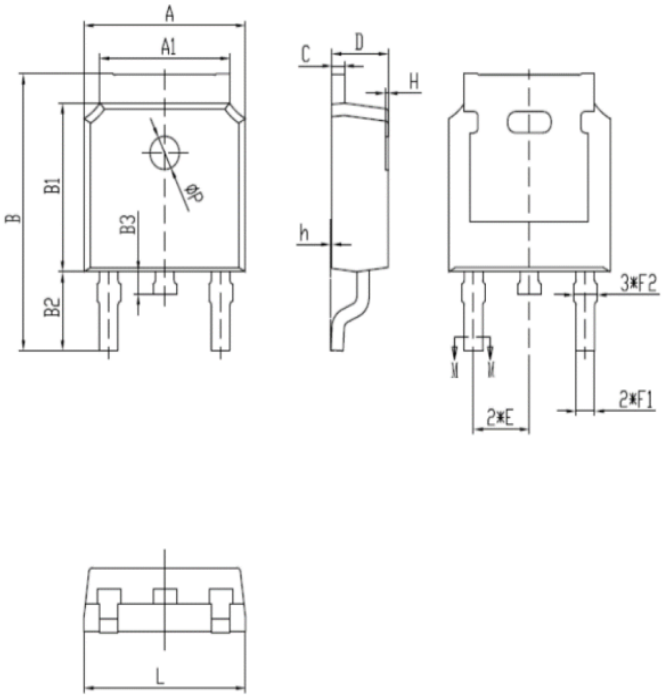


Figure C. Definition of body diodeswitching characteristics



Reverse Recovery Definitions

Package Outline:



项目	规范(mm)	
	MIN	MAX
A	6.50	6.70
A1	5.16	5.46
B	9.77	10.17
B1	6.00	6.20
B2	2.60	3.00
B3	0.70	0.90
C	0.45	0.61
D	2.20	2.40
E	2.186	2.386
F1	0.67	0.87
F2	0.76	0.96
H	0.00	0.30
h	0.00	0.127
L	6.50	6.70
ΦP	1.10	1.30

Contact Information

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