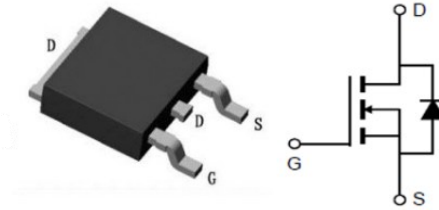


## Features

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

## Applications

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



## Product Summary

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



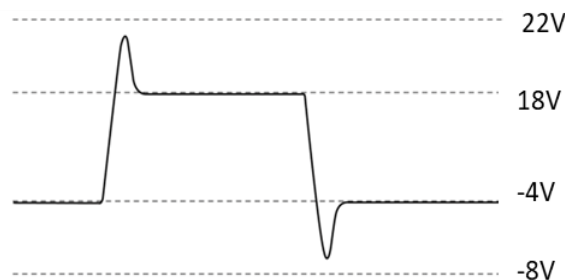
## Package Marking and Ordering Information

Part #	Marking	Package
T2M350120E	2M350120E	TO-252

## Absolute Maximum Ratings

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

- 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  $T_j = 25^\circ\text{C}$ , unless otherwise specified)**

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

**Static Characteristic**

Drain-source breakdown voltage	$V_{(BR)DSS}$	1200	-	-	V	$V_{GS}=0V, I_D=100\mu A$
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	$\mu A$	$V_{DS}=1200V, V_{GS}=0V$ $T_C=25^\circ C$
		-	5	-		$T_C=175^\circ C$
Gate-source leakage current	$I_{GSS}$	-		100	nA	$V_{GS}=18V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	350	430	mΩ	$V_{GS}=18V, I_D=3.5A,$ $T_j=25^\circ C$
		-	550	-		$T_j=175^\circ C$
Drain-source on-state resistance	$R_{DS(on)}$	-	380	430	mΩ	$V_{GS}=15V, I_D=3.5A,$ $T_j=25^\circ C$
		-	610	-		$T_j=175^\circ C$

**Dynamic Characteristic**

Input Capacitance	C <sub>iSS</sub>	-	294.1	-	pF	V <sub>DS</sub> = 1000V V <sub>GS</sub> = 0V T <sub>J</sub> = 25°C V <sub>AC</sub> =25mV f = 1MHz
Output Capacitance	C <sub>oSS</sub>	-	14.5	-		
Reverse Transfer Capacitance	C <sub>rSS</sub>	-	3.3	-		
Gate Total Charge	Q <sub>G</sub>	-	13.8	-	nC	V <sub>DS</sub> = 800V V <sub>GS</sub> = 0/+18V I <sub>D</sub> = 3.5A I <sub>G</sub> =10mA
Gate-Source charge	Q <sub>gs</sub>	-	1.76	-		
Gate-Drain charge	Q <sub>gd</sub>	-	7.36	-		
Turn-On Switching Energy	E <sub>ON</sub>	-	52.1	-	uJ	V <sub>DD</sub> = 800V V <sub>GS</sub> = -4/+18V I <sub>D</sub> = 3.5A R <sub>G</sub> = 5Ω L = 1mH T <sub>J</sub> = 25°C
Turn-Off Switching Energy	E <sub>OFF</sub>	-	12.62	-		
Turn-on delay time	t <sub>d(on)</sub>	-	4.2	-	ns	
Rise time	t <sub>r</sub>	-	2	-		
Turn-off delay time	t <sub>d(off)</sub>	-	10.2	-		
Fall time	t <sub>f</sub>	-	9.8	-		
Gate resistance	R <sub>G</sub>	-	3.0	-	Ω	V <sub>AC</sub> = 25mV, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V <sub>SD</sub>		4.2		V	V <sub>GS</sub> =-4V, I <sub>SD</sub> =1.7A, T <sub>J</sub> =25°C
			3.8			V <sub>GS</sub> =-4V, I <sub>SD</sub> =1.7A, T <sub>J</sub> =175°C
Reverse Recovery Time	t <sub>rr</sub>	-	22.2	-	ns	V <sub>R</sub> = 800V I <sub>D</sub> = 3.5A di/dt = 1000A/μS V <sub>GS</sub> = -4V T <sub>J</sub> = 25°C
Reverse Recovery Charge	Q <sub>rr</sub>	-	36	-	nC	
Reverse Recovery Energy	E <sub>REC</sub>	-	14.74	-	uJ	
Peak Reverse Recovery Current	I <sub>rrm</sub>	-	2.67	-	A	
Charge Time	t <sub>A</sub>	-	10.8	-	ns	
DisCharge Time	t <sub>B</sub>	-	11.4	-	ns	

## Typical Performance Characteristics

Fig 1. Output Characteristic ( $T_J = -55^\circ\text{C}$ )

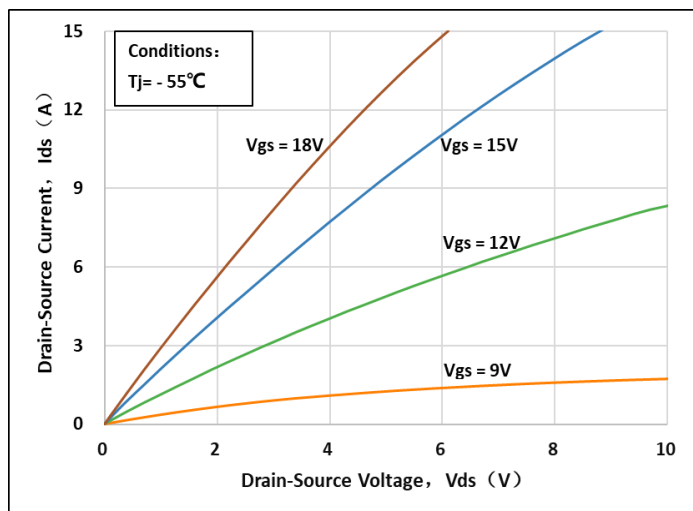


Fig 2. Output Characteristic ( $T_J = 25^\circ\text{C}$ )

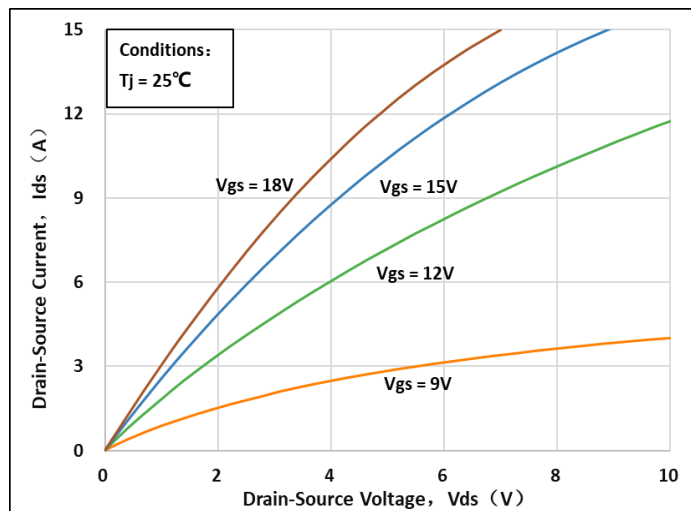


Fig 3. Output Characteristic ( $T_J = 175^\circ\text{C}$ )

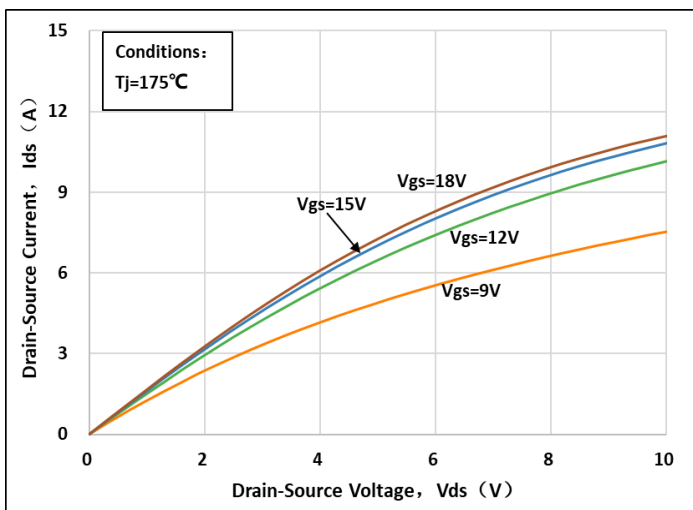


Fig 4:  $R_{DS(on)}$  Vs  $I_{DS}$  Characteristic

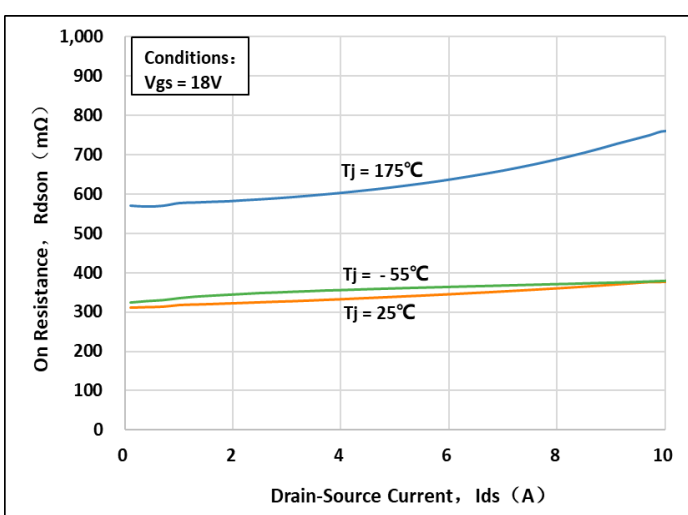


Fig 5:  $R_{DS(on)}$  vs. Temperature

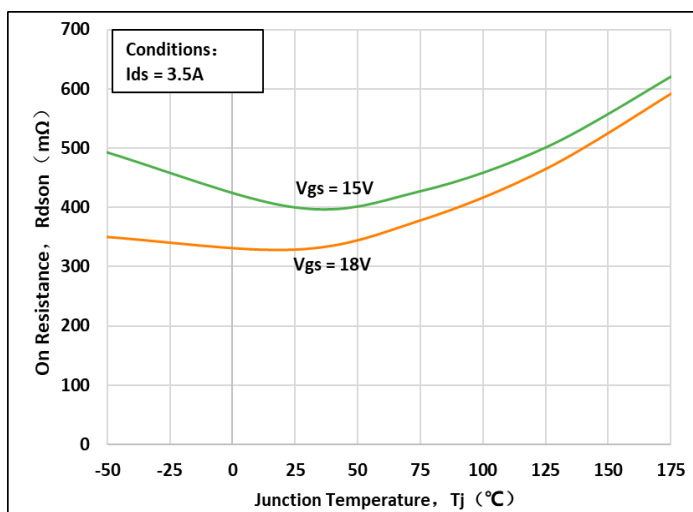


Fig 6: Transfer Characteristic

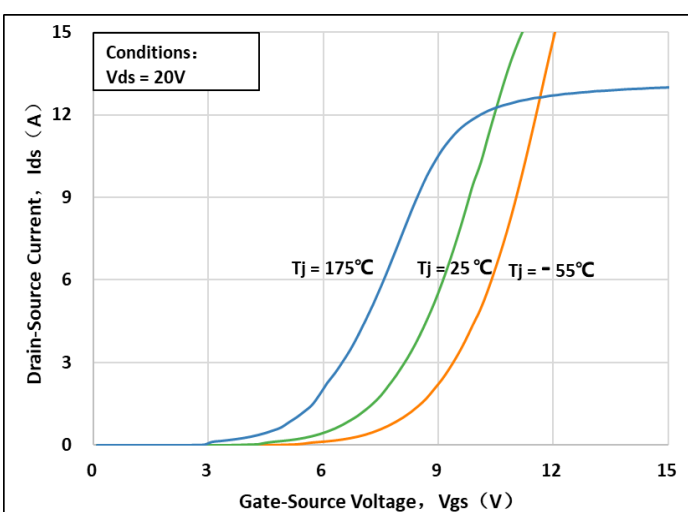


Fig 7: Body-diode Characteristic (T<sub>J</sub>=-55°C)

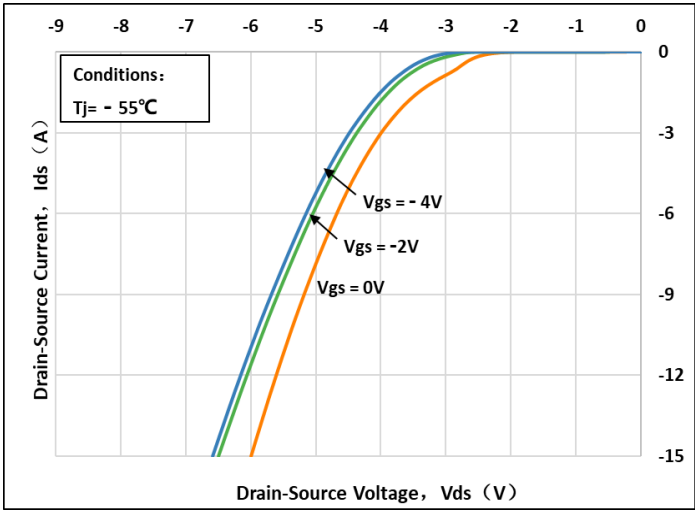


Fig 8: Body-diode Characteristic (T<sub>J</sub>=25°C)

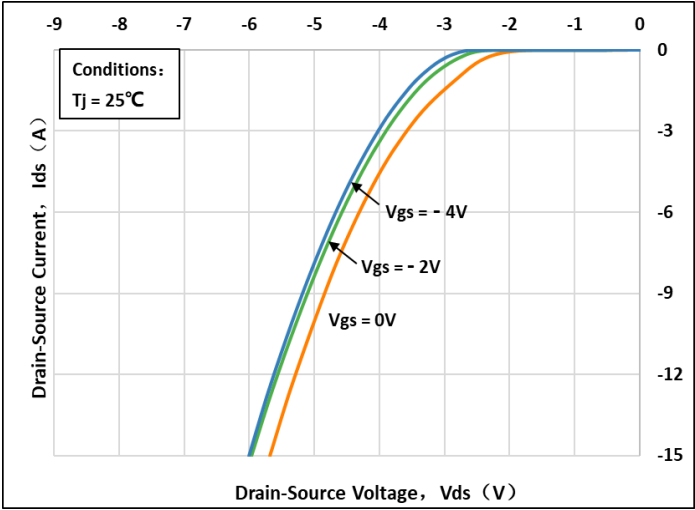


Fig 9: Body-diode Characteristic (T<sub>J</sub>=175°C)

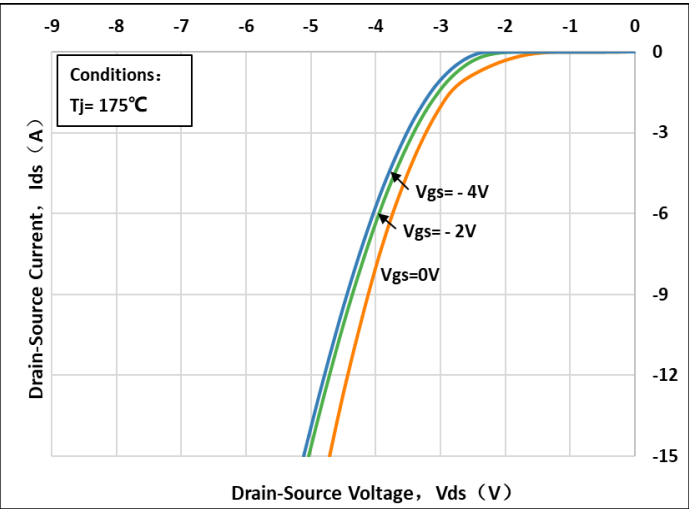


Fig 10: V<sub>TH</sub> Vs T<sub>J</sub> Temperature Characteristic

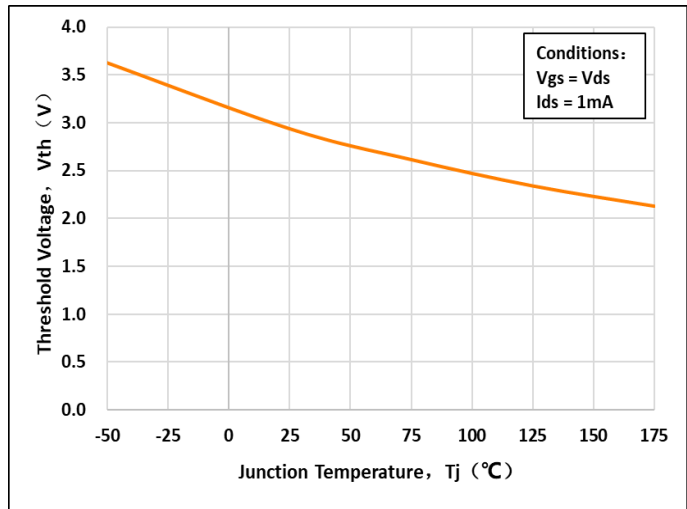


Fig 11: 3rd Quadrant Characteristic(T<sub>J</sub>=-55°C)

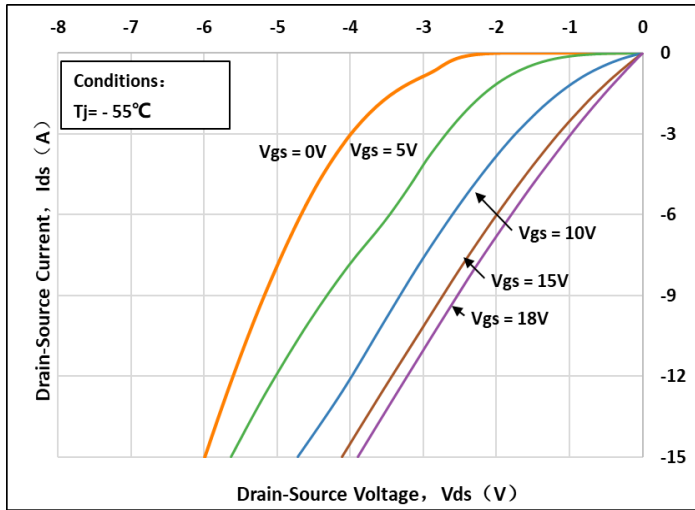


Fig 12: 3rd Quadrant Characteristic(T<sub>J</sub>=25°C)

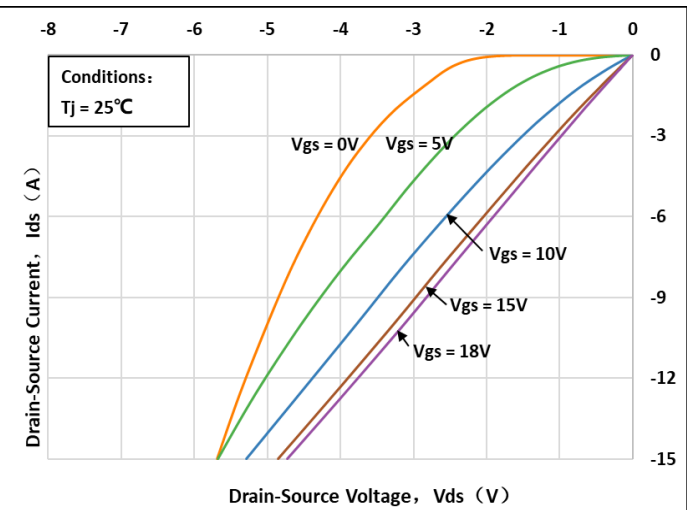


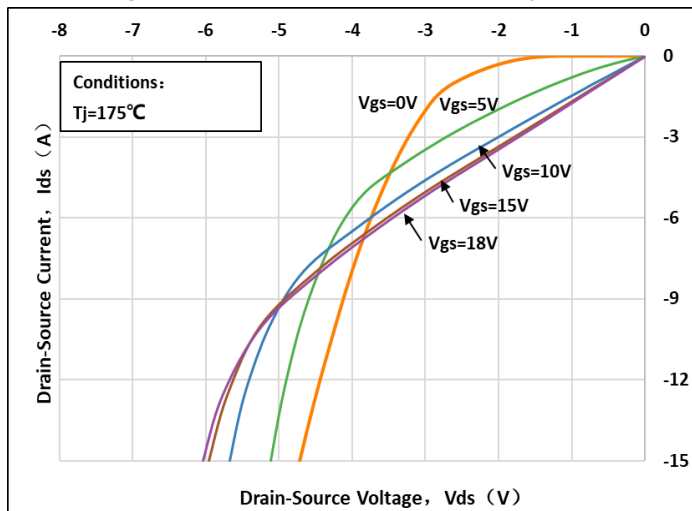
Fig 13: 3rd Quadrant Characteristic( $T_J=175^\circ\text{C}$ )

Fig 14: Gate Charge Characteristics

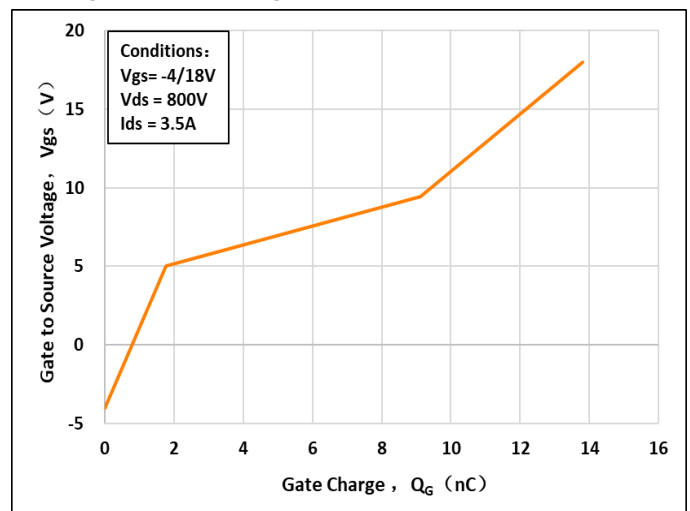


Fig 15: Drain Current vs. Case Temperature

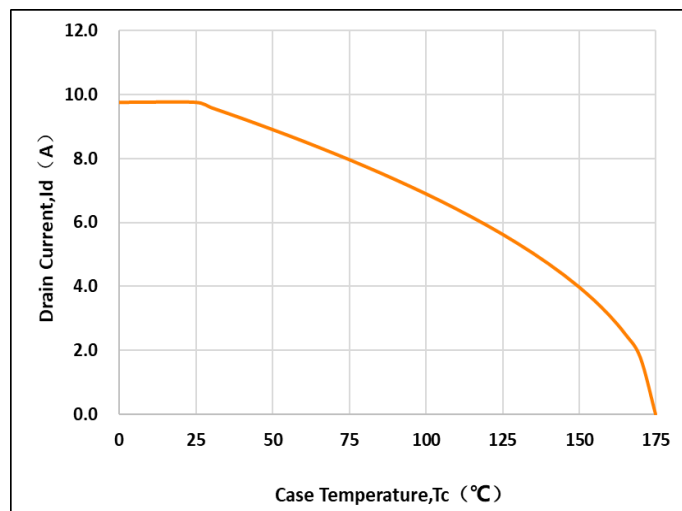


Fig 16: Safe Operating Area

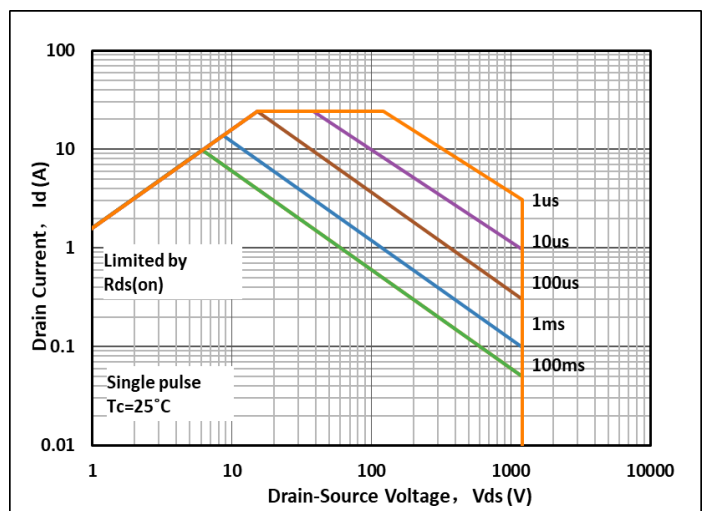


Fig 17: Capacitance Characteristics

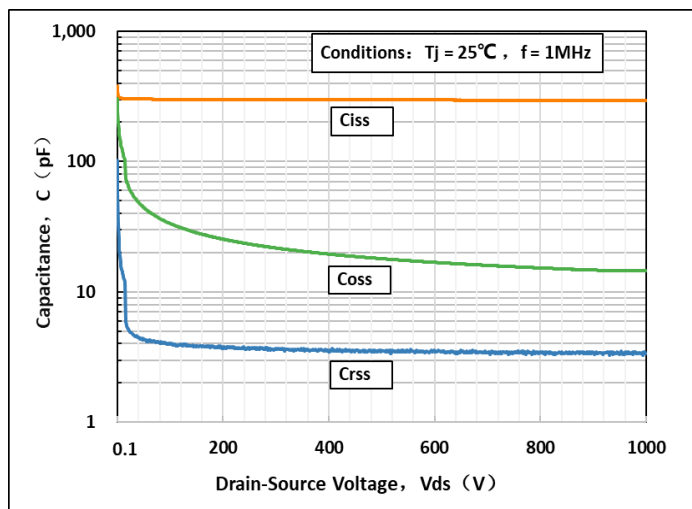
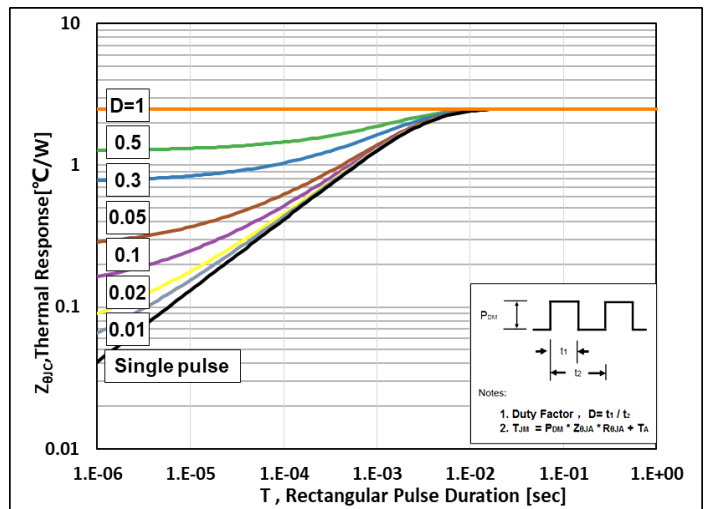


Fig 18: Transient Thermal Impedance



Test Circuit & Waveform

Figure A. Definition of switching times

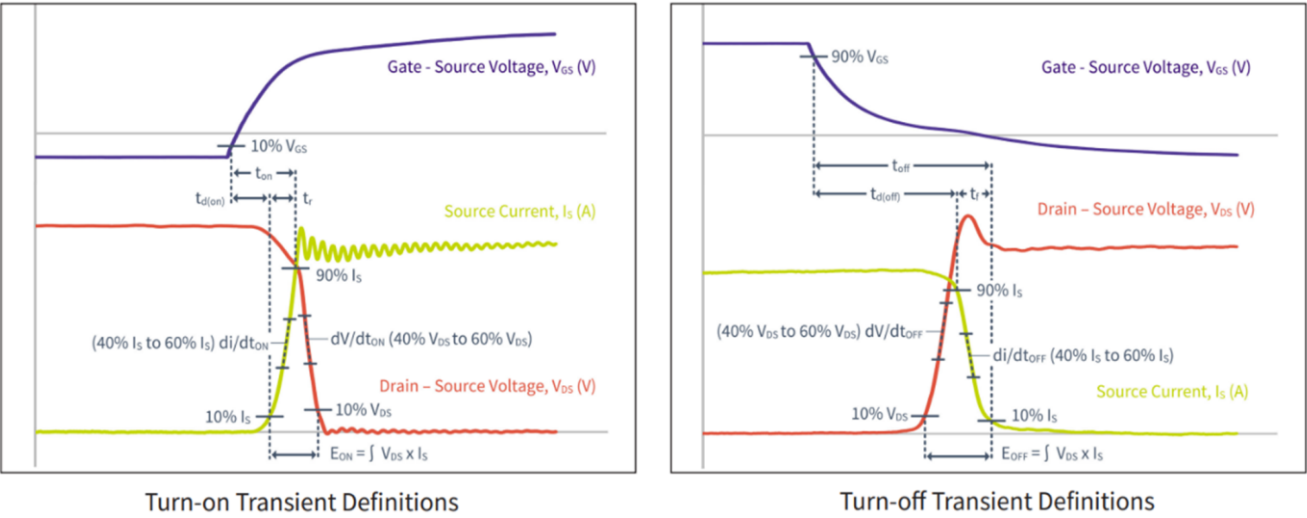


Figure B. Dynamic test circuit

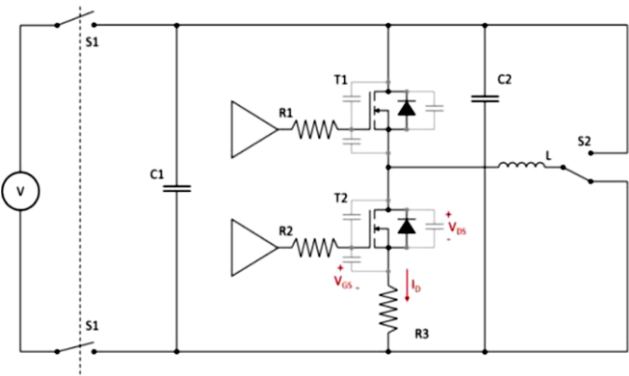
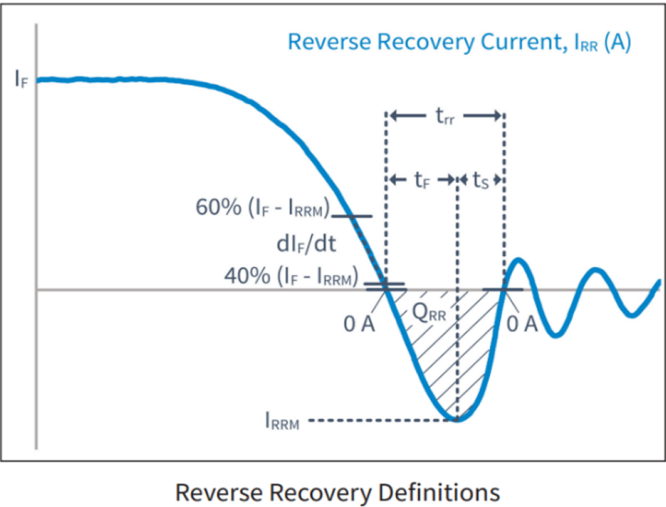
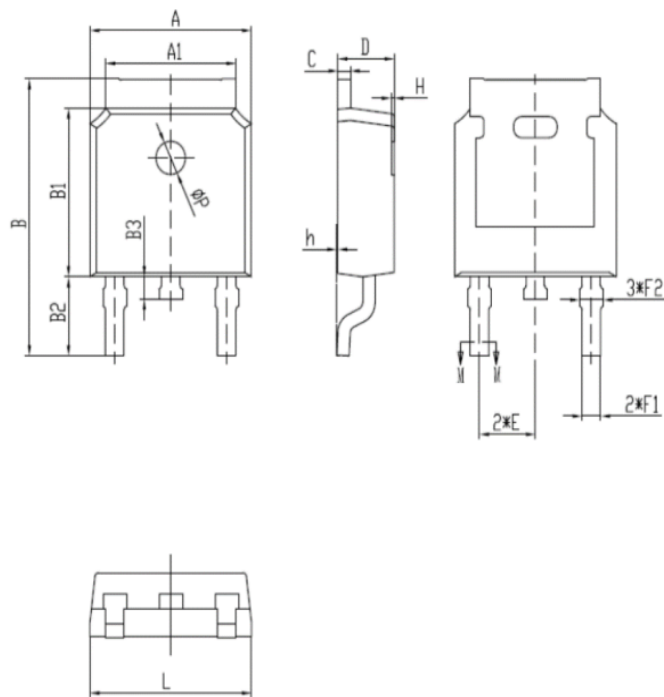


Figure C. Definition of body diodeswitching characteristics



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
Φ P	1.10	1.30

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For additional information, please contact your local Sales Representative.

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The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

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The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. TANI shall assume no responsibility for any consequences resulting from such usage.

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