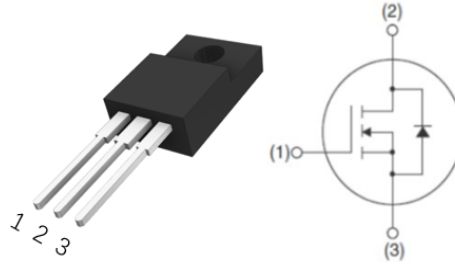


Features

- 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}	800V
$R_{DS(on)_{typ}}$	200mΩ
I_D	13.3A



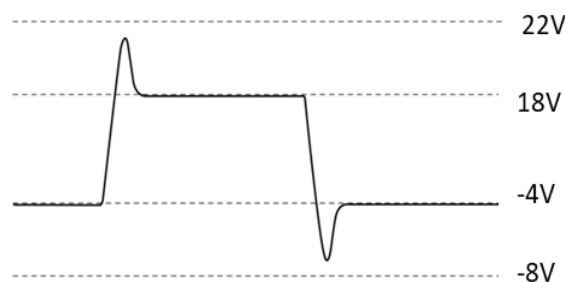
Package Marking and Ordering Information

Part #	Marking	Package
T2M200080F	2M200080F	TO-220F

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	800	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	13.3 7.7	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	13.3 7.7	A
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	I_{DM}	45	A
Avalanche energy, single pulse ($L=10\text{mH}$)	E_{AS}	180	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}	50	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}	3.0	°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	$V_{(BR)DSS}$	800	-	-	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	μA	$V_{DS}=800V, V_{GS}=0V$ $T_C=25^\circ\text{C}$
		-	5	-		$T_C=175^\circ\text{C}$
Gate-source leakage current	I_{GSS}	-		100	nA	$V_{GS}=18V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	200	260	mΩ	$V_{GS}=18V, I_D=3.6A,$ $T_j=25^\circ\text{C}$
		-	240	-		$T_j=175^\circ\text{C}$
Drain-source on-state resistance	$R_{DS(on)}$	-	250	320	mΩ	$V_{GS}=15V, I_D=3.6A,$ $T_j=25^\circ\text{C}$
		-	310	-		$T_j=175^\circ\text{C}$

Dynamic Characteristic

Input Capacitance	C _{iss}	-	338.2	-	pF	V _{DS} = 600V V _{GS} = 0V T _J = 25°C V _{AC} =25mV f = 1MHz
Output Capacitance	C _{oss}	-	16.7	-		
Reverse Transfer Capacitance	C _{rss}	-	3.8	-		
Gate Total Charge	Q _G		15.6	-	nC	V _{DS} = 600V V _{GS} = 0/+18V I _D = 3.6A I _G =10mA
Gate-Source charge	Q _{gs}	-	2.76	-		
Gate-Drain charge	Q _{gd}	-	7.86	-		
Turn-On Switching Energy	E _{ON}	-	52.1	-	uJ	V _{DD} = 600V V _{GS} = -4/+18V I _D = 3.6A 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} =1.8A, T _J =25°C
		-	3.8	-		V _{GS} =-4V, I _{SD} =1.8A, T _J =175°C
Reverse Recovery Time	t _{rr}	-	22.2	-	ns	V _R = 600V I _D = 3.6A 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°C)

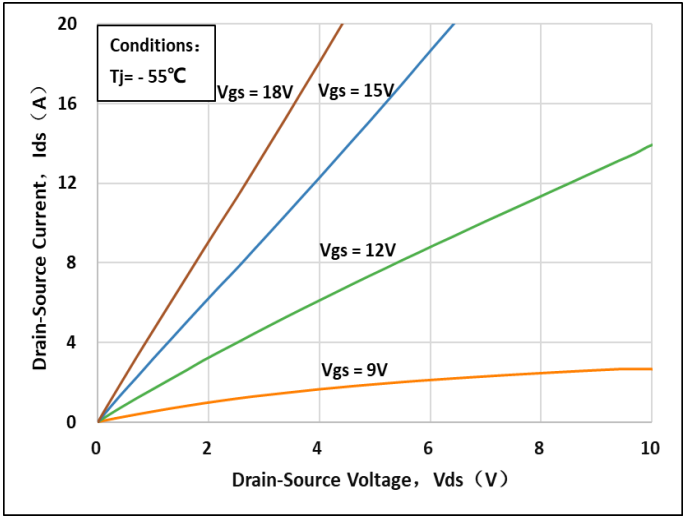


Fig 2. Output Characteristic (T_J=25°C)

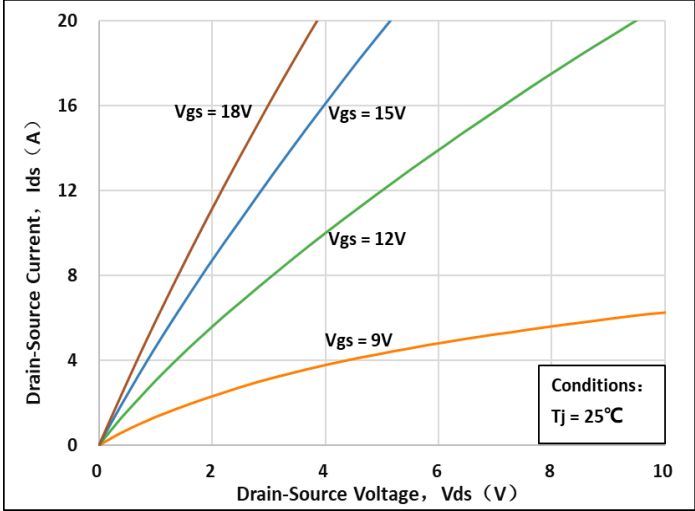


Fig 3. Output Characteristic (T_J=175°C)

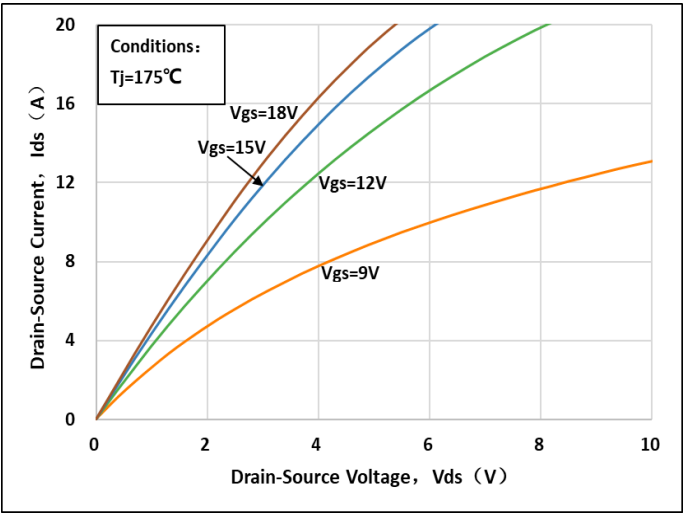


Fig 4: Rdson Vs Ids Characteristic

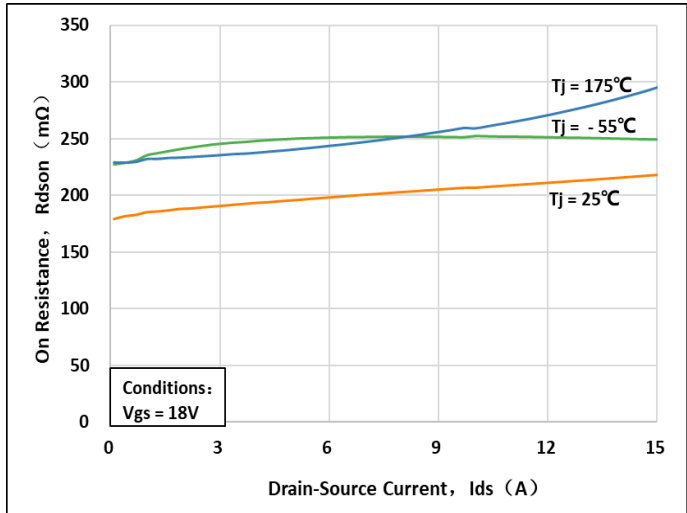


Fig 5: Rds(on) vs. Temperature

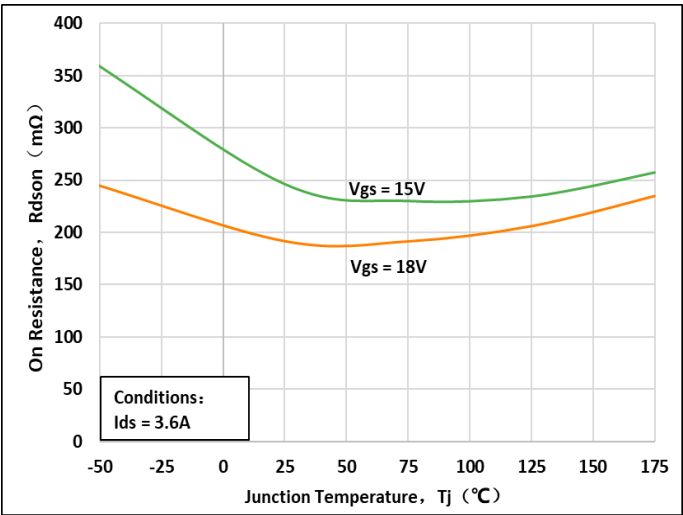


Fig 6: Transfer Characteristic

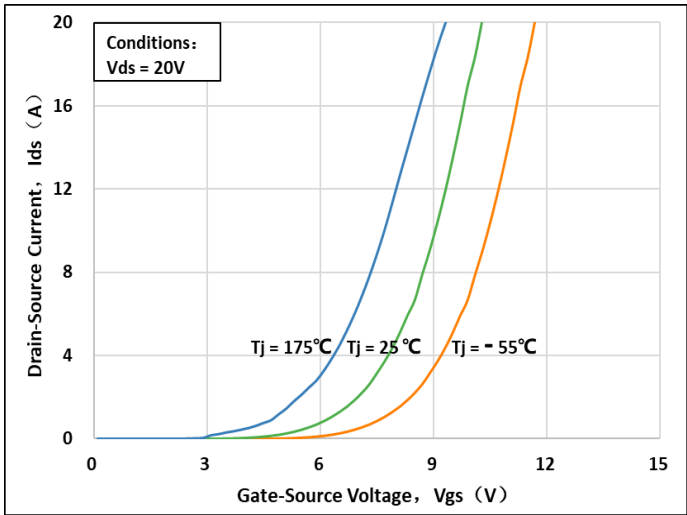


Fig 7: Body-diode Characteristic (T_J=-55°C)

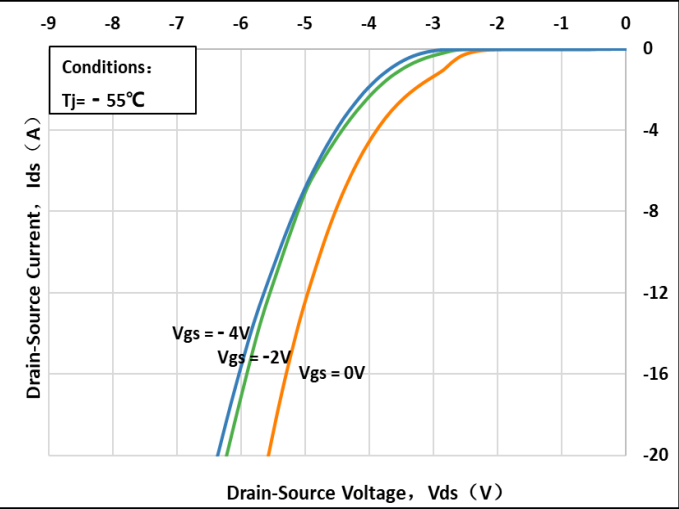


Fig 8: Body-diode Characteristic (T_J=25°C)

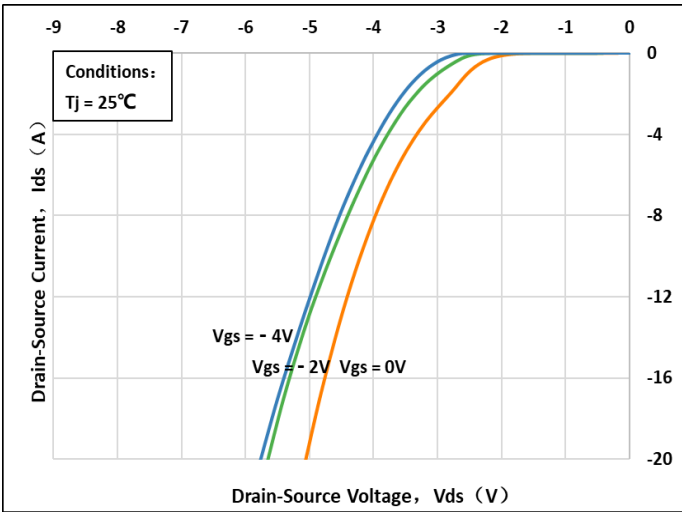


Fig 9: Body-diode Characteristic (T_J=175°C)

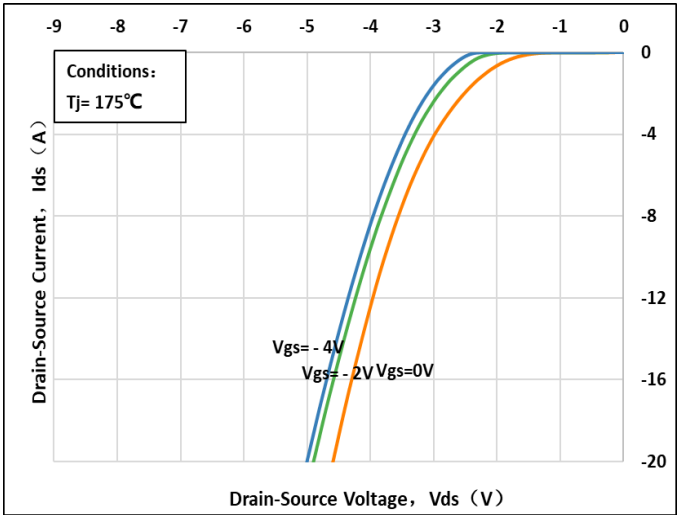


Fig 10: V_{TH} Vs T_J Temperature Characteristic

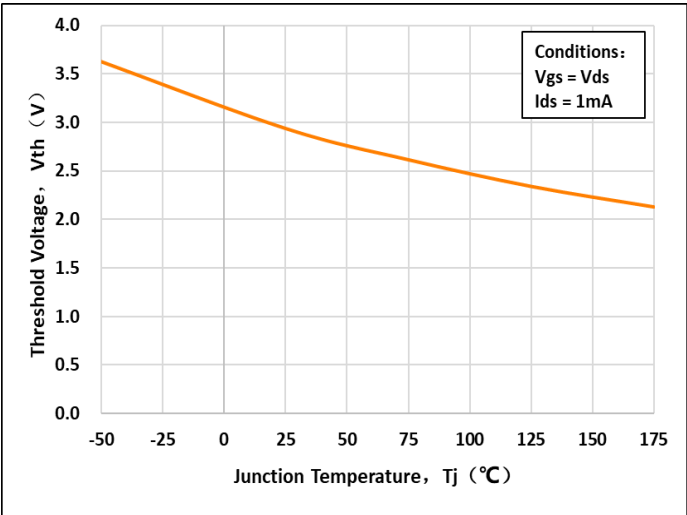


Fig 11: 3rd Quadrant Characteristic(T_J=-55°C)

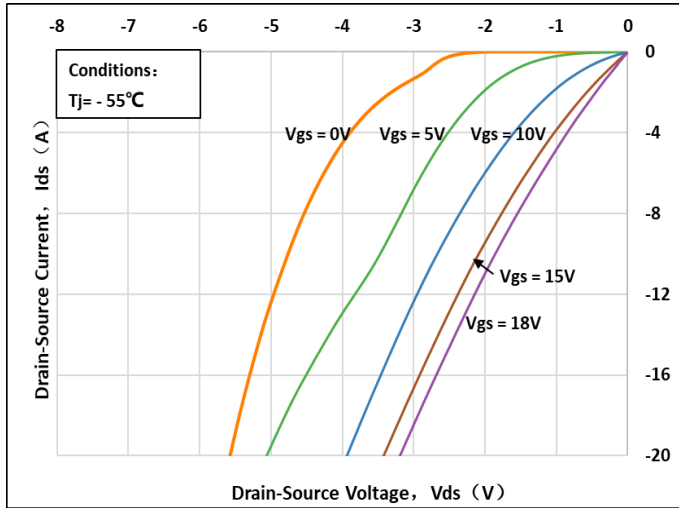


Fig 12: 3rd Quadrant Characteristic(T_J=25°C)

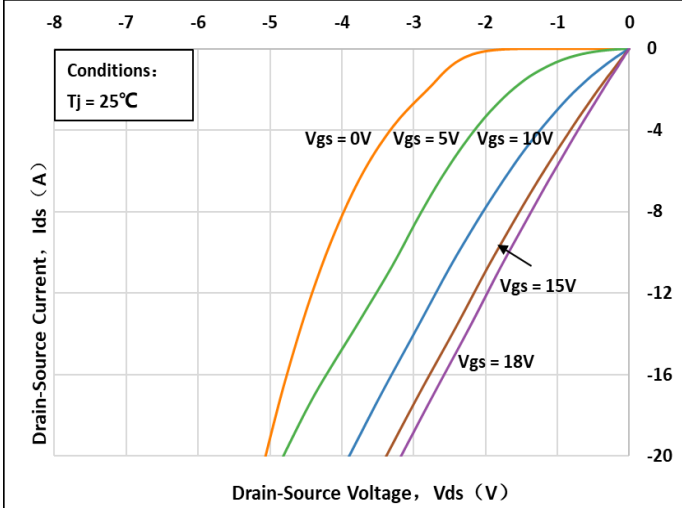


Fig 13: 3rd Quadrant Characteristic(T_J=175°C)

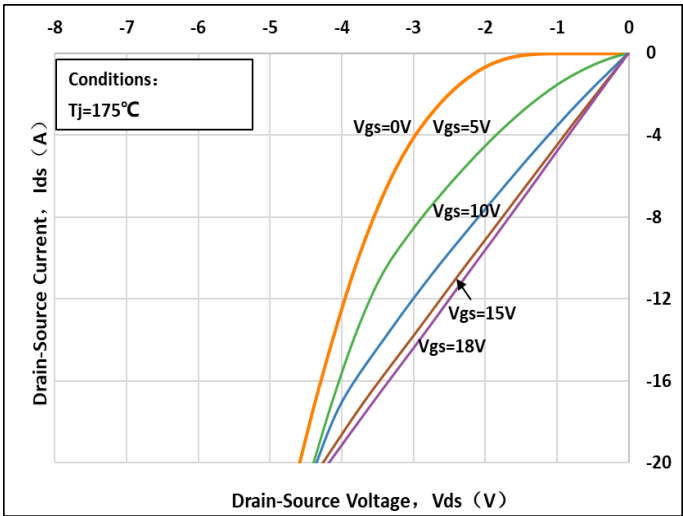


Fig 14: Gate Charge Characteristics

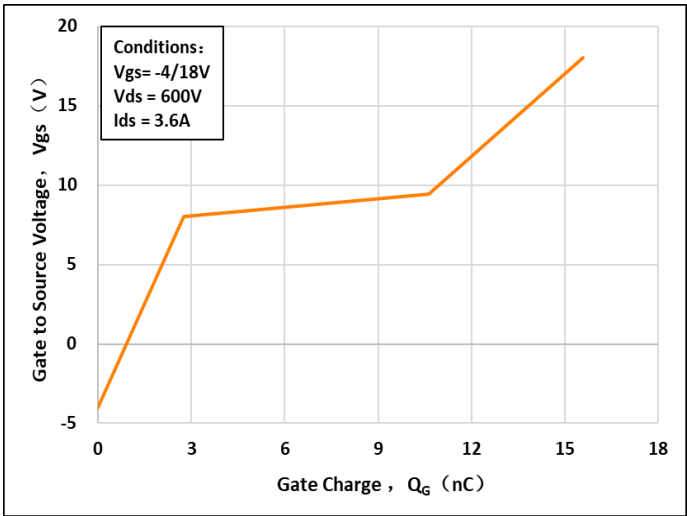


Fig 15: Drain Current vs.Case Temperature

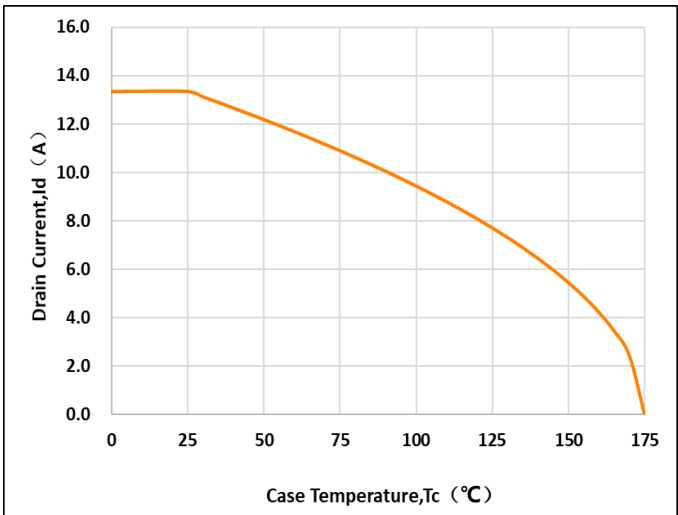


Fig 16: Safe Operating Area

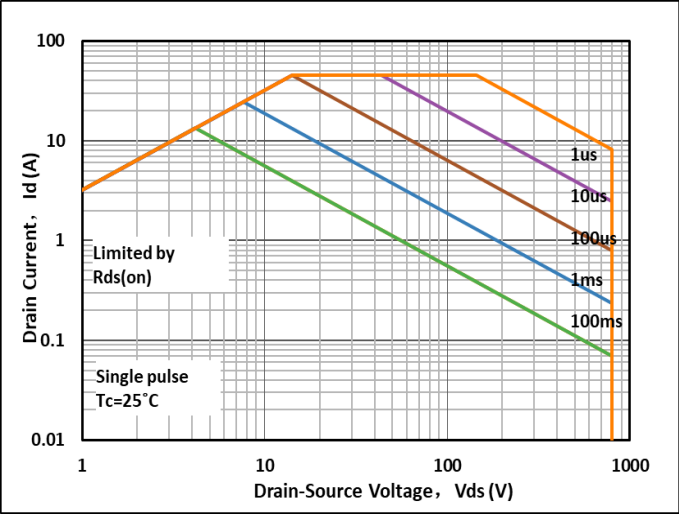


Fig 17: Capacitance Characteristics

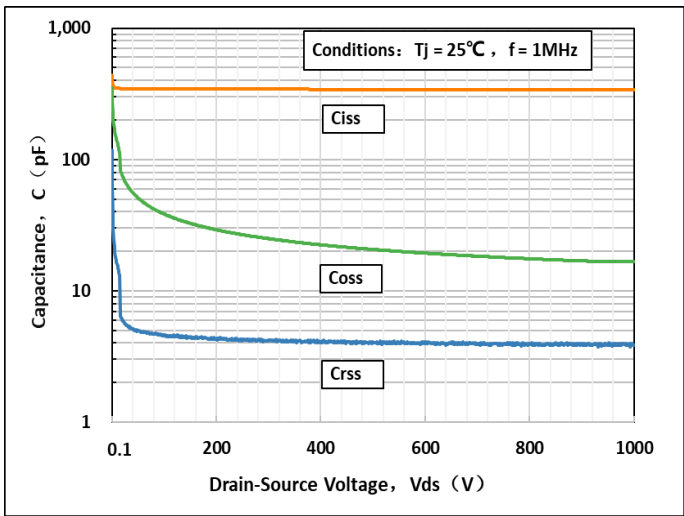
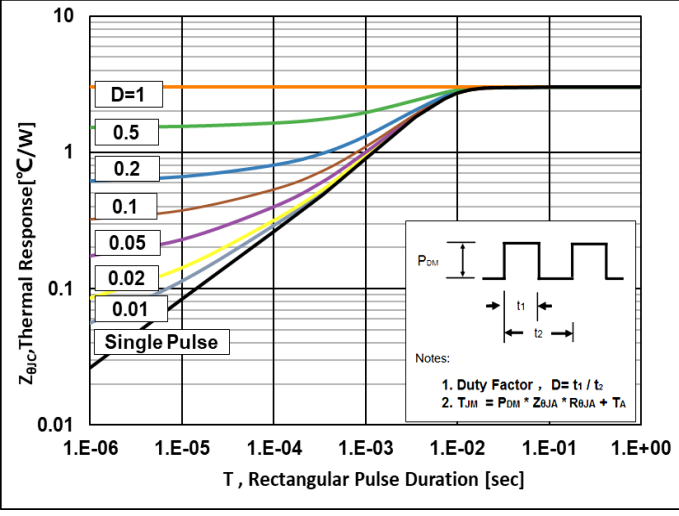


Fig 18: Transient Thermal Impedance



Test Circuit & Waveform

Figure A. Definition of switching times

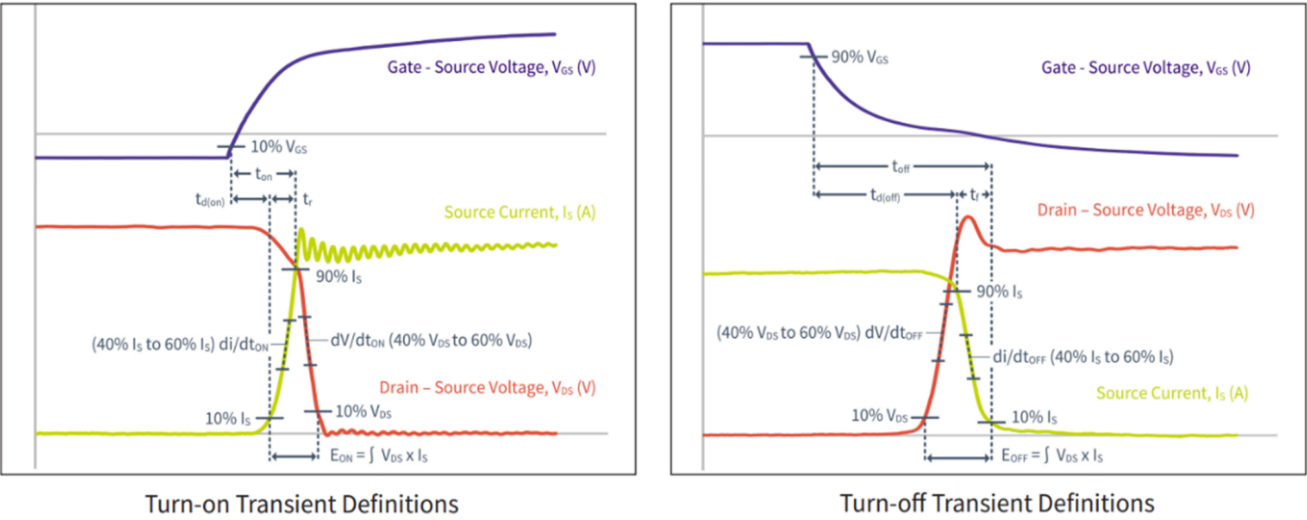


Figure B. Dynamic test circuit

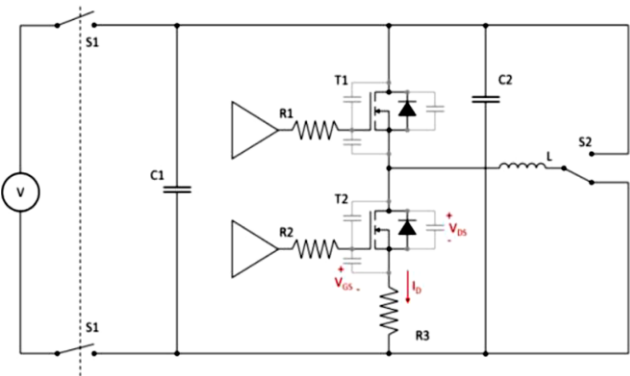
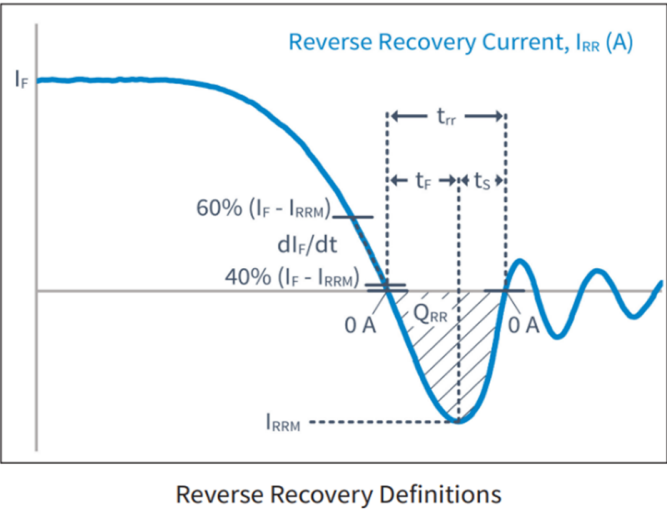
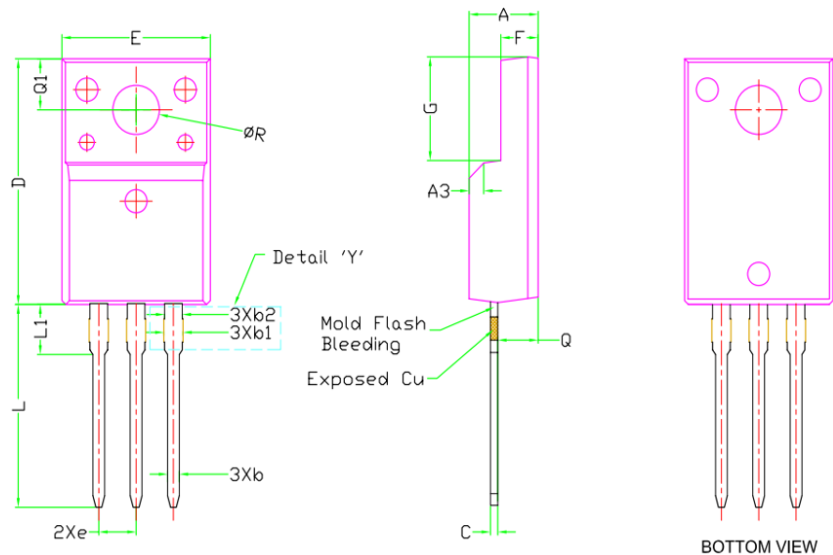


Figure C. Definition of body diodeswitching characteristics



Package Outline:



SYMBOL	DIMENSIONS		
	Min.	Nom.	Max.
A	4.60	4.70	4.80
b	0.70	0.80	0.91
b1	1.20	1.30	1.47
b2	1.10	1.20	1.30
C	0.45	0.50	0.63
D	15.80	15.87	15.97
e	2.54		
E	10.00	10.10	10.30
F	2.44	2.54	2.64
G	6.50	6.70	6.90
L	12.90	13.10	13.30
L1	3.13	3.23	3.33
Q	2.65	2.75	2.85
Q1	3.20	3.30	3.40
ΦR	3.08	3.18	3.28

Contact Information

TANI website: <http://www.tanisemi.com> Email: tani@tanisemi.com
For additional information, please contact your local Sales Representative.

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Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

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