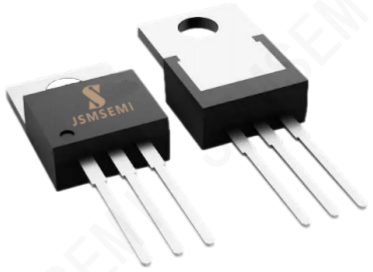
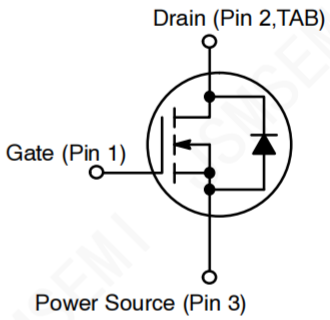
Product Summary

- V_{DS} 100V
- I_D 110A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜5.0mΩ
- 100% EAS Tested
- 100% ▽V_{DS} Tested



General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free



Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor
- Motor drivers

ABSOLUTE MAXIMUM RATINGS (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Tc=25℃) (1)	I_D	110	A
Continuous Drain Current (Tc=100℃)	I_D	85	A
Pulsed Drain Current (1)	I_{DM}	440	A
Drain Power Dissipation	P_D	180	W
Single Pulsed Avalanche Energy (2)	E_{AS}	340	mJ
Thermal Resistance from Junction to Ambient (3)	$R_{\theta JA}$	43	℃/W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.0	℃/W
Junction Temperature	T_J	-55~ +150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

Notes:

1) Repetitive Rating: pulse width limited by maximum junction temperature
2) EAS condition : T_J=25℃, V_{DD}=50V, V_G=10V, L=1.0mH, R_g=25Ω, I_{AS}=44.7A
3) The value of RθJA Mounted on FR4 Board（25.4mm*25.4mm*t1.6mm）With 2oz Copper TA=25℃

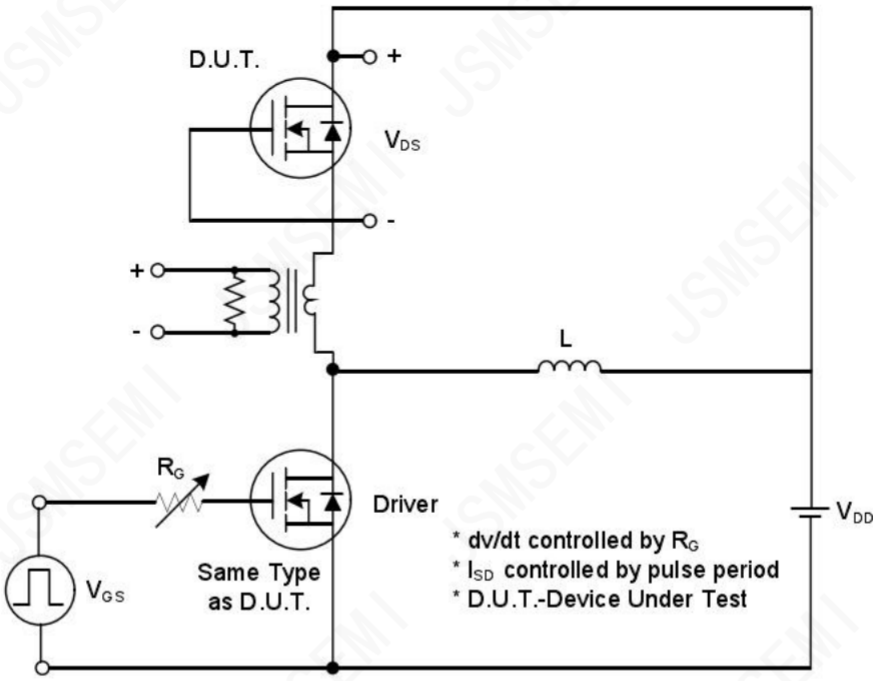
MOSFET ELECTRICAL CHARACTERISTICS(T_J=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	100	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2.0	3.0	4.0	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A	-	4.5	5.0	mΩ
Forward transconductance	R_g	V_{GS}= 0V, V_{DS}= 0V, f=1.0MHz	-	2.0	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =50V, VGS=0V, f=1MHz	-	4628	-	pF
Output Capacitance	C_{oss}		-	1624	-	
Reverse Transfer Capacitance	C_{rss}		-	19	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V, I_D=20A, R_G=3Ω, V_{GS}=10V	-	12	-	nS
Turn-on rise time	t_r		-	26	-	
Turn-off delay time	$t_{d(off)}$		-	38	-	
Turn-off fall time	t_f		-	31	-	
Total Gate Charge	Qg	V_{DS}=50V, I_D=20A, V_{GS}=10V	-	61	-	nC
Gate-Source Charge	Qgs		-	19.5	-	
Gate-Drain Charge	Qgd		-	8.7	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=20A	-	0.8	1.2	V
Diode Forward current	I_S	T_C=25℃	-	-	110	A
Body Diode Reverse Recovery Time	trr	T_J=25℃, I_F=20A,di/dt=100A/us	-	77	-	nS
Body Diode Reverse Recovery Charge	Qrr		-	189	-	nC

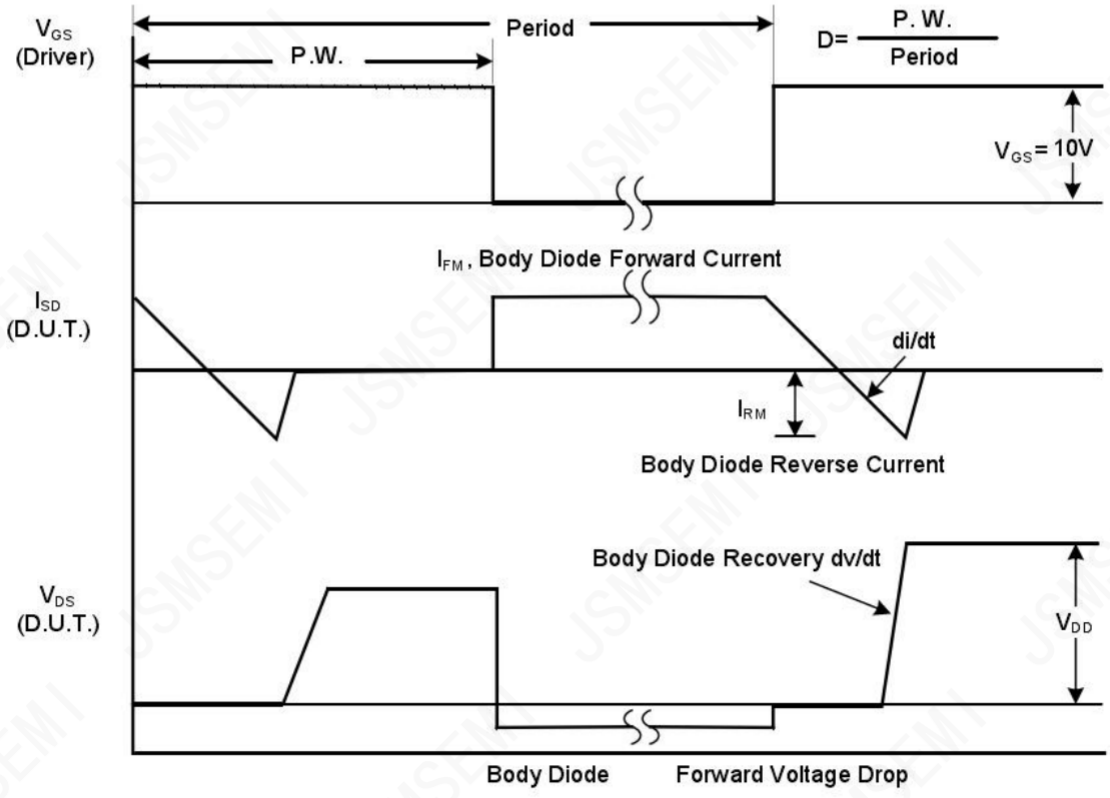
Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
IPP050N10NF2SAKMA1-JSM	TO-220-3	050N10CGH	-55 to 150°C	1	T&R,800	Rohs

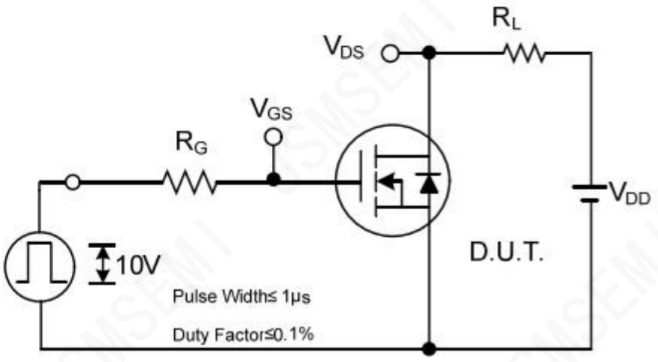
■ RATING AND CHARACTERISTIC CURVES



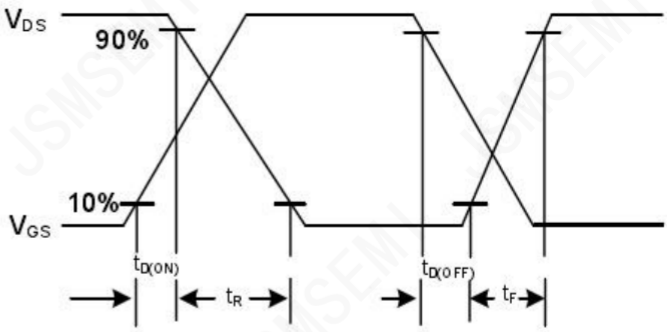
Peak Diode Recovery dv/dt Test Circuit



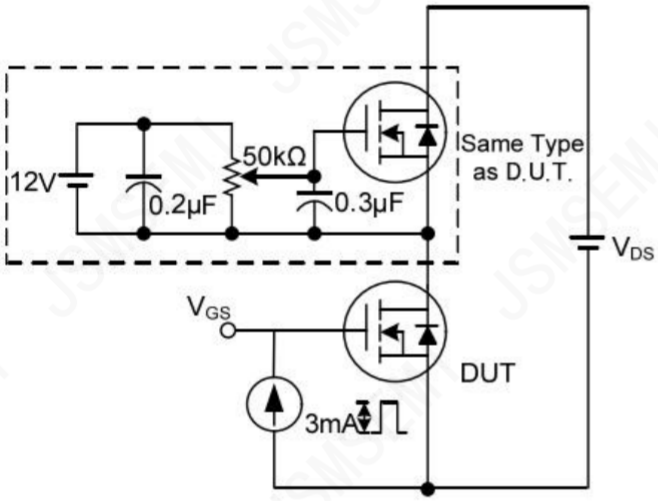
Peak Diode Recovery dv/dt Waveforms



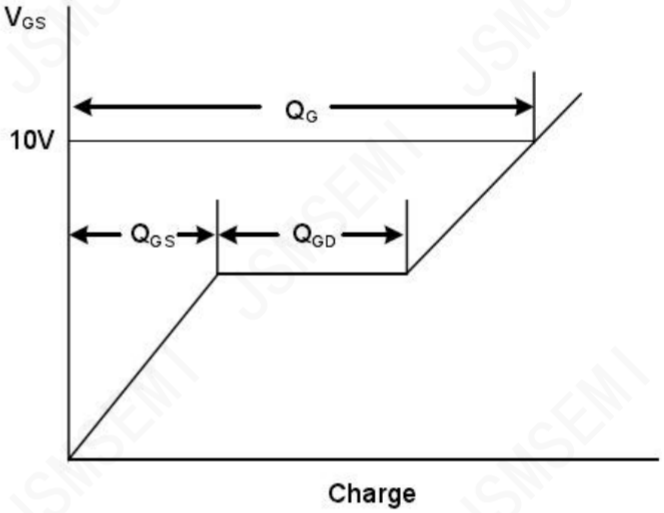
Switching Test Circuit



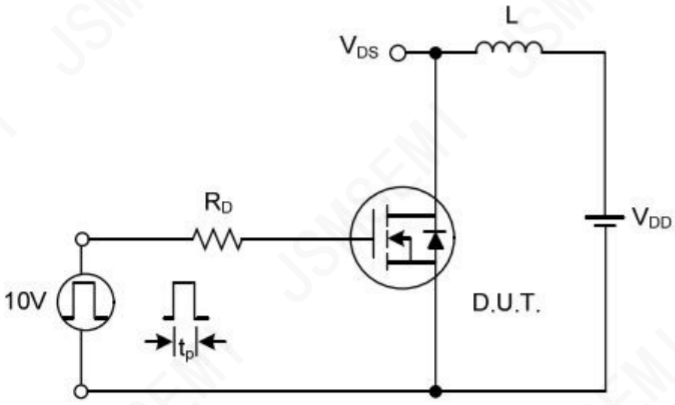
Switching Waveforms



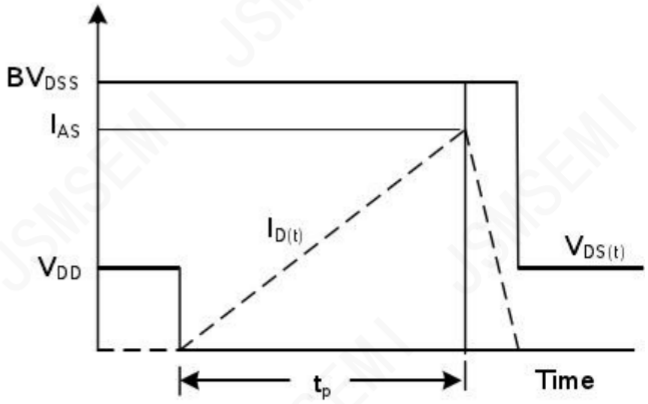
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

Typical Characteristics

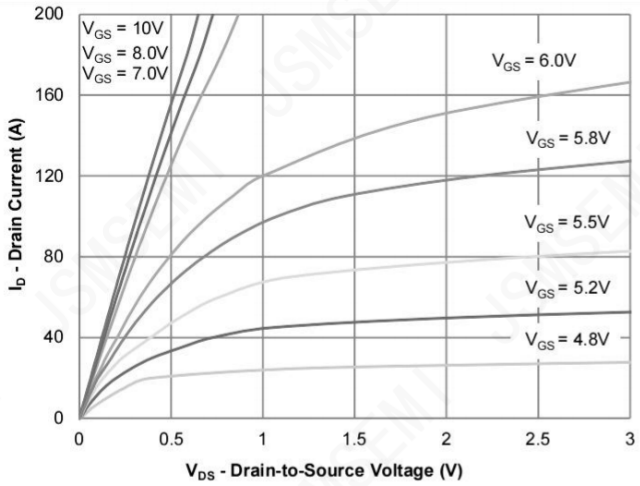


Figure 1: Output Characteristics

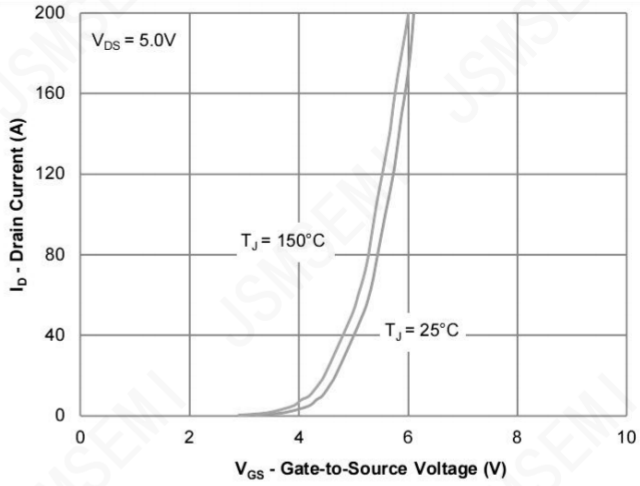


Figure 2: Transfer Characteristics

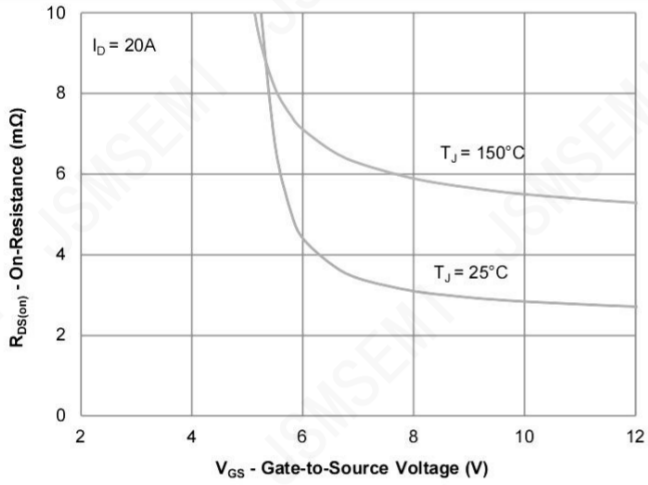


Figure 3: On-Resistance vs. Gate-Source Voltage

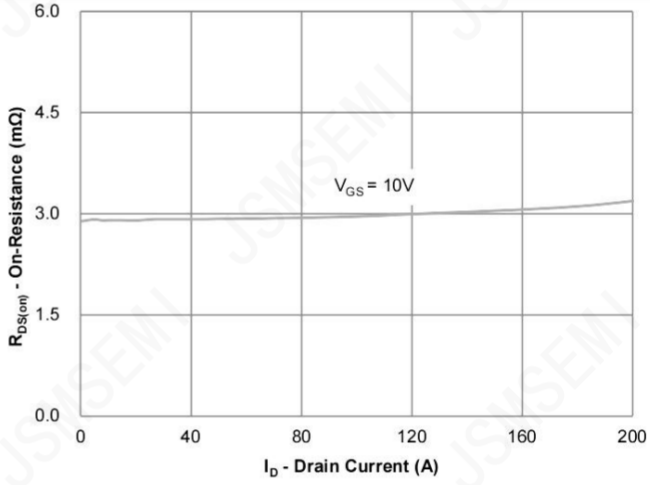


Figure 4: On-Resistance vs. Gate-Source Voltage

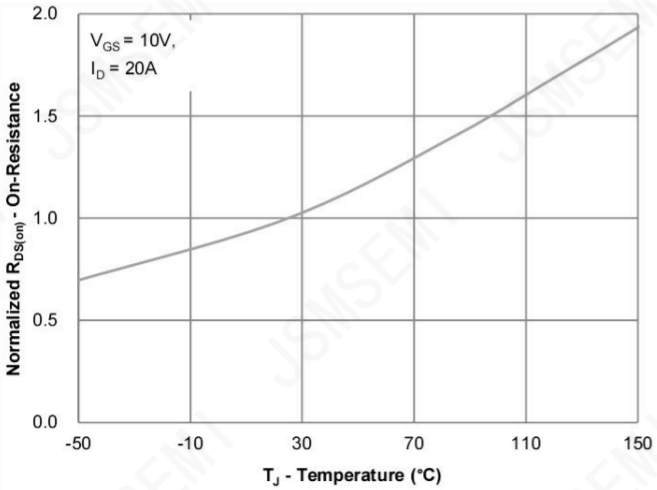


Figure 5: On-Resistance vs. Junction Temperature

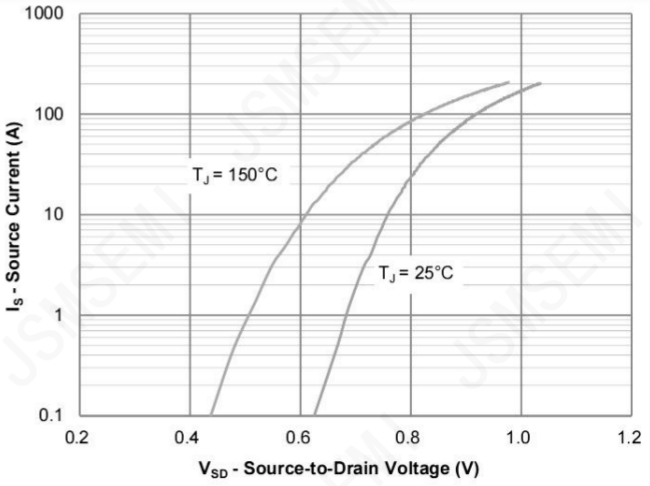


Figure 6: Source-Drain Diode Forward Voltage

Typical Characteristics

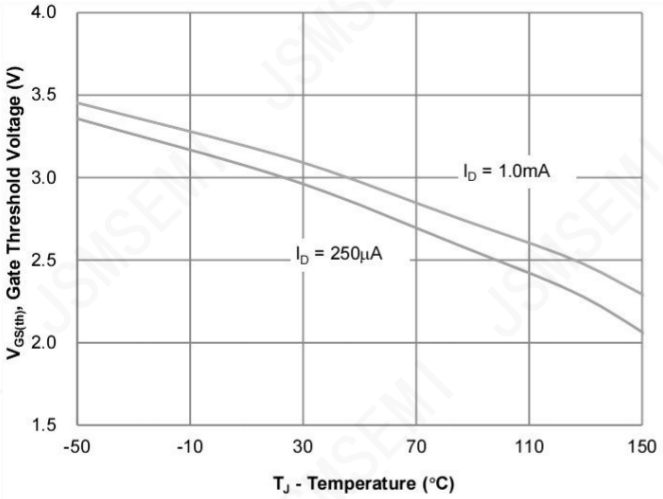


Figure 7: Gate Threshold Variation vs. Junction Temperature

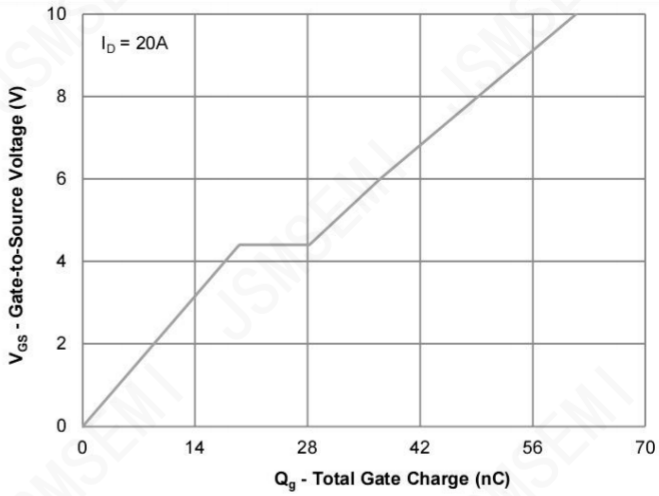


Figure 8: Gate Charge Characteristics

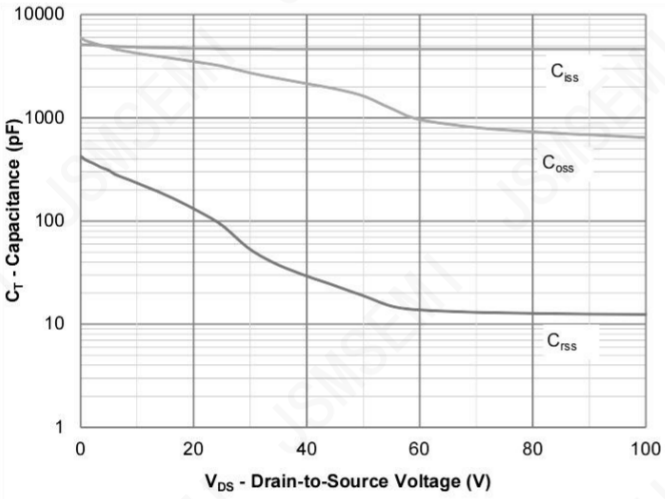


Figure 9: Capacitance Characteristics

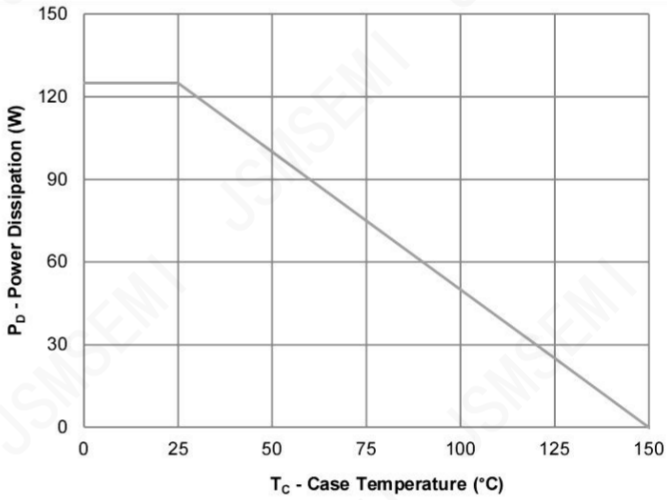


Figure 10: Power Derating

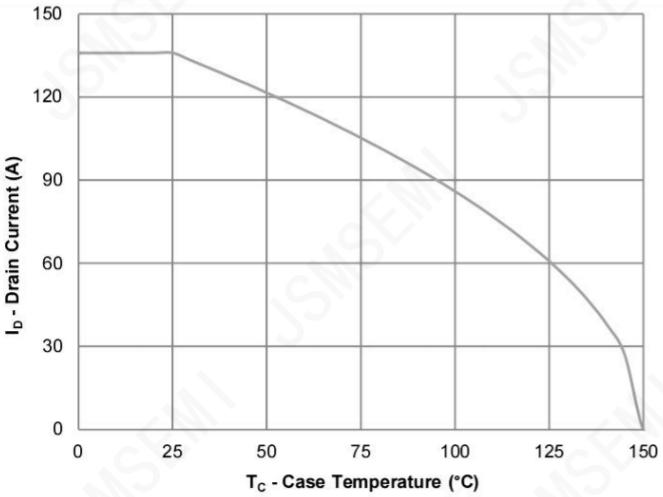


Figure 11: Current Derating

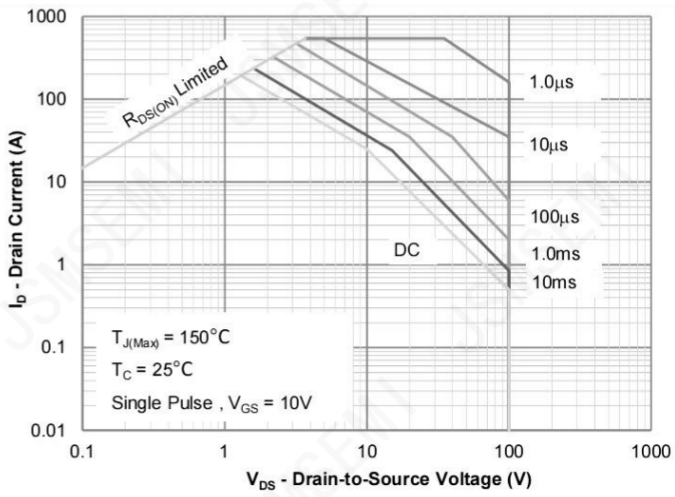


Figure 12: Safe Operating Area

Typical Characteristics

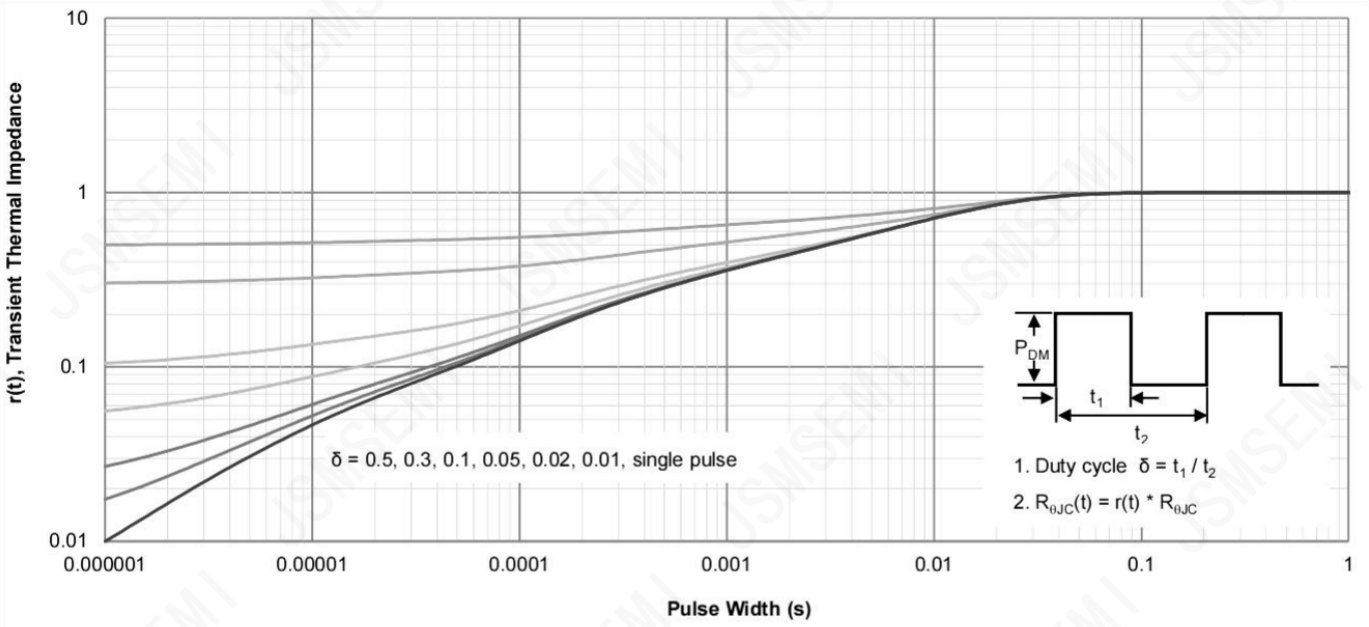
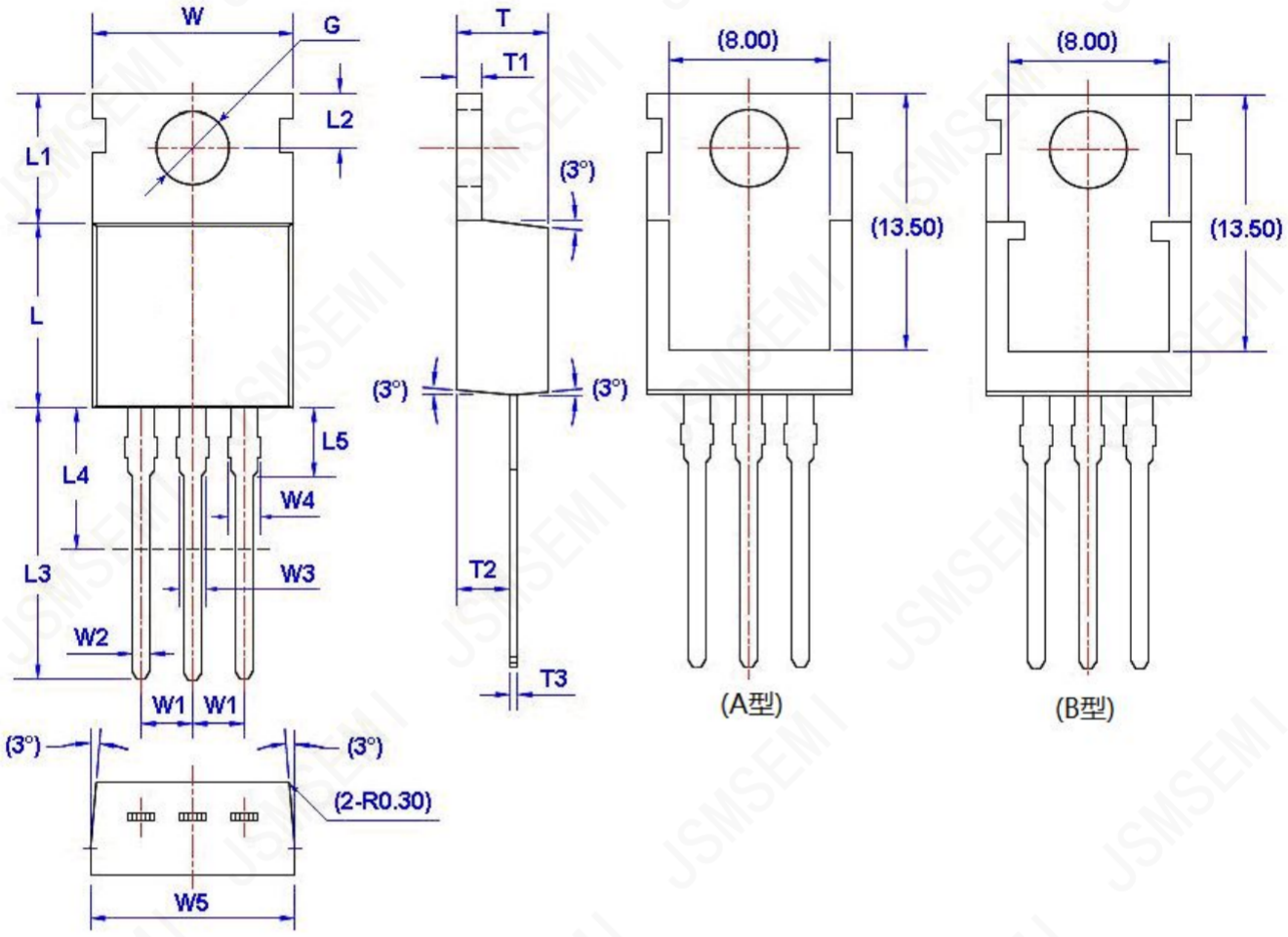


Figure 13: Normalized Maximum Transient Thermal Impedance

Package Information

TO-220-3



Unit: mm

Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.66	10.28	W5	9.80	10.20	L4**	6.20	6.60	T3	0.45	0.60
W1	2.54（TYP）		L	9.00	9.40	L5	2.79	3.30	G(Φ)	3.50	3.70
W2	0.70	0.95	L1	6.40	6.80	T	4.30	4.70			
W3	1.17	1.37	L2	2.70	2.90	T1	1.15	1.40			
W4*	1.32	1.72	L3	12.70	14.27	T2	2.20	2.60			

Revision History

Rev.	Change	Date
V1.0	Initial version	9/17/2020

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