

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	50mΩ@10V	50A

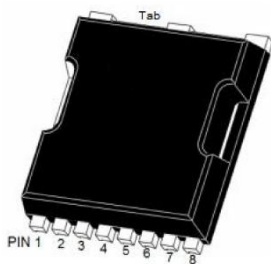
Feature

- Fast Switching
- Low Gate Charge and Rdson

Application

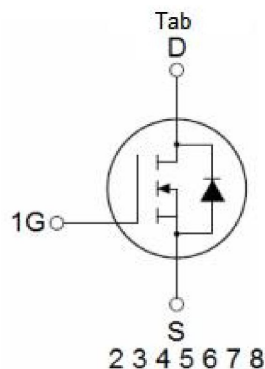
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

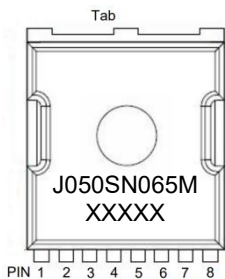


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Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	50	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	34	A
Pulsed Drain Current	I_{DM}	200	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	210	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	305	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.41	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

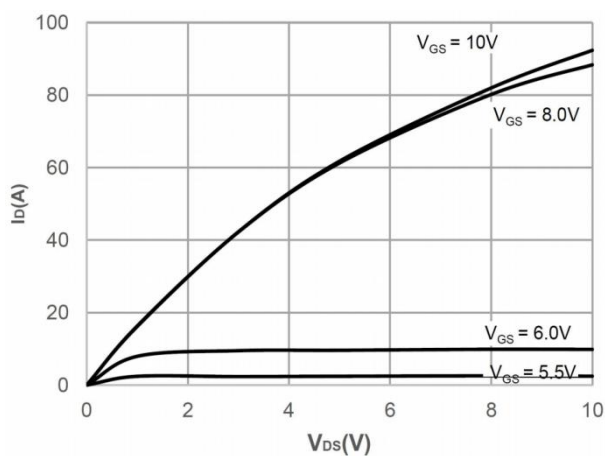
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	650			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =520V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	3	4	5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =35A		40	50	mΩ
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f =100kHz		4240		pF
Output Capacitance	C _{oss}			64		
Reverse Transfer Capacitance	C _{rss}			45		
Total Gate Charge	Q _g	V _{DS} =200V, V _{GS} =10V, I _D =40A		81		nC
Gate-Source Charge	Q _{gs}			26		
Gate-Drain Charge	Q _{gd}			24		
Turn-on delay time	t _{d(on)}	V _{DS} =200V, V _{GS} =10V, I _D =40A R _G =20Ω		34		nS
Turn-on rise time	t _r			11		
Turn-off delay time	t _{d(off)}			124		
Turn-off fall time	t _f			5		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				50	A
Diode Forward voltage	V _{SD}	V _{GS} =0V,I _S =1A,T _J =25°C			1.2	V
Reverse Recovery Time	T _{rr}	I _S =40A ,di/dt =100A/μs		1.61		nS
Reverse Recovery Charge	Q _{rr}	T _J =25°C		1.1		μC

Notes:

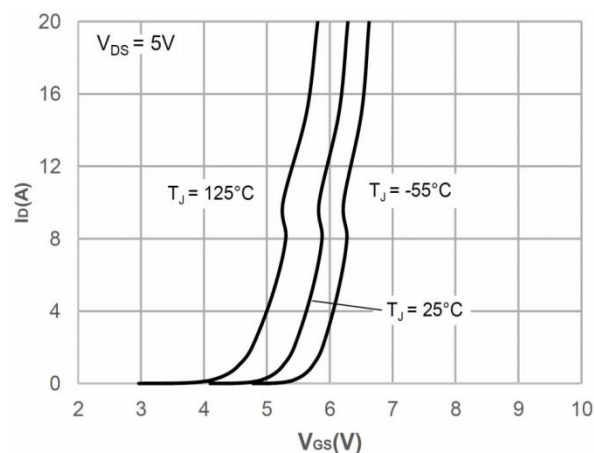
1) The test condition is $V_{DD}=50\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, R_G=25\Omega$.

2) Guaranteed by design, not subject to production.

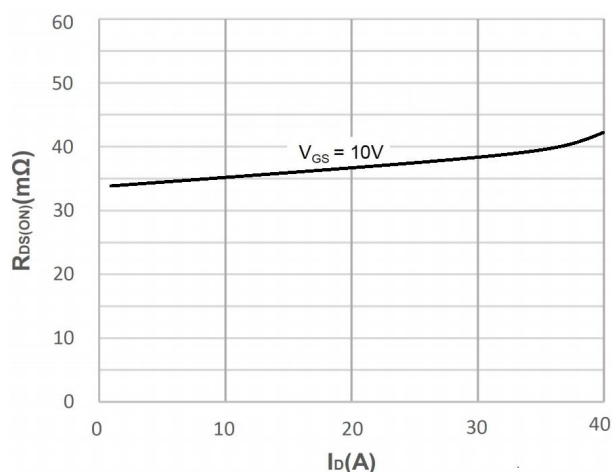
Typical Characteristics



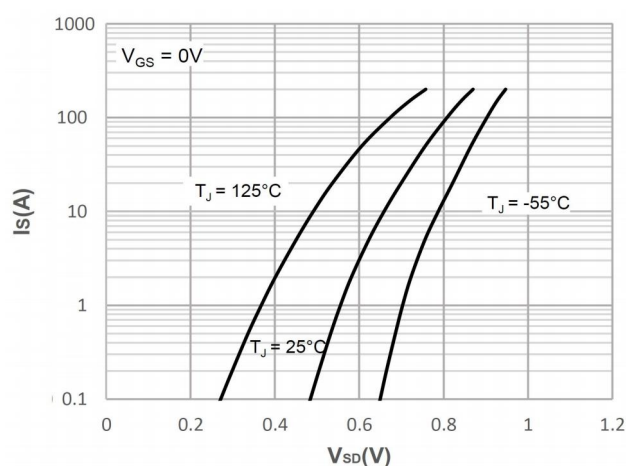
Output Characteristics



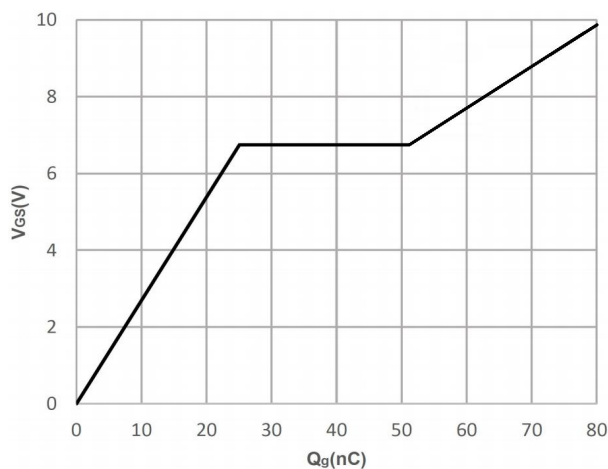
Typical Transfer Characteristics



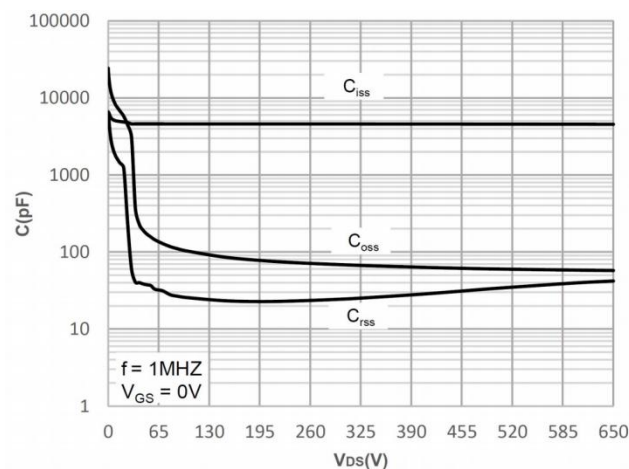
On-resistance vs. Drain Current



Body Diode Characteristics

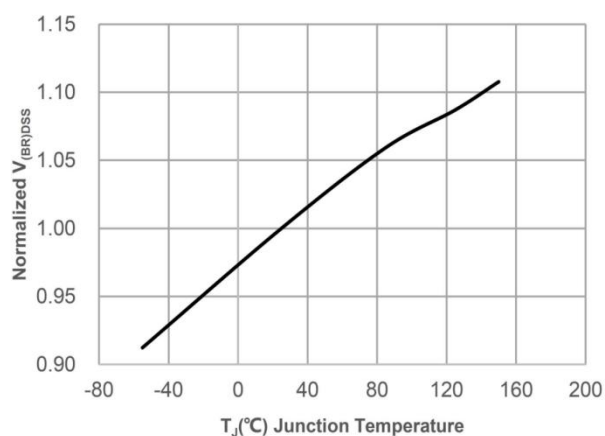


Gate Charge Characteristics

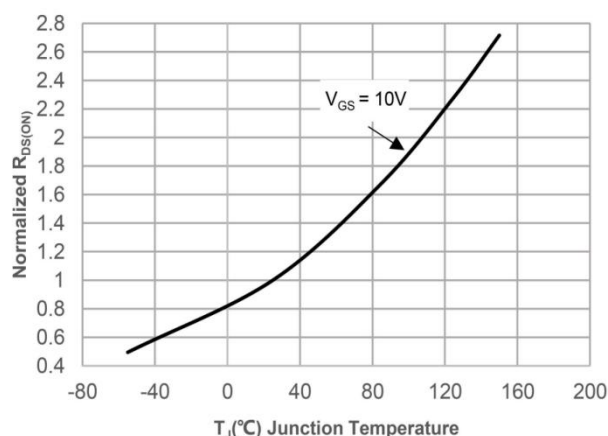


Capacitance Characteristics

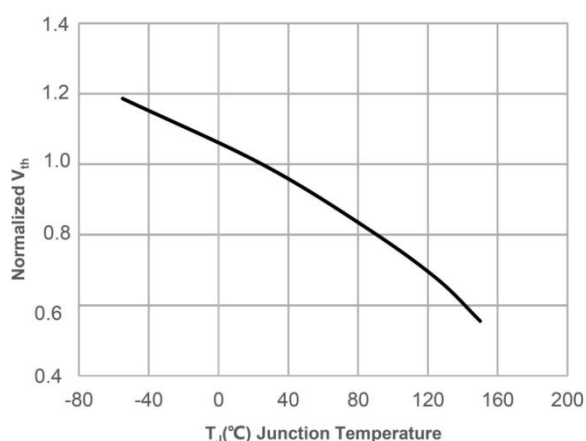
Typical Characteristics



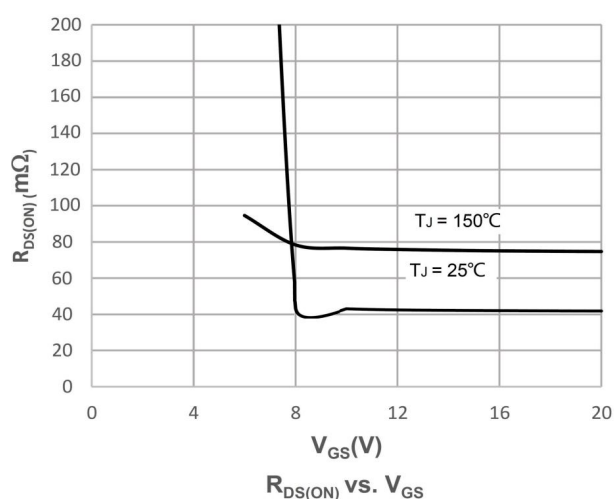
Normalized Breakdown voltage vs. Junction Temperature



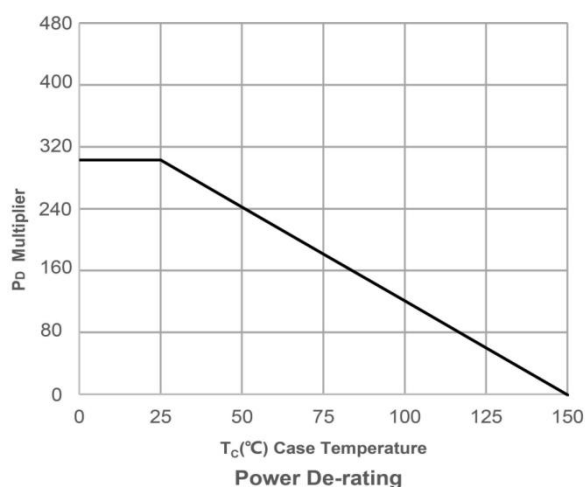
Normalized on Resistance vs. Junction Temperature



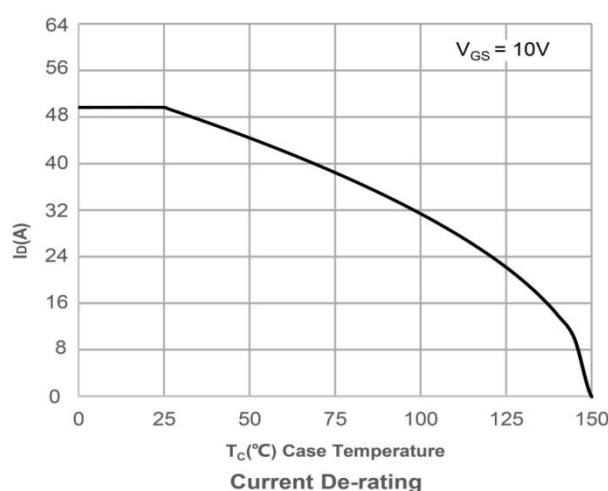
Normalized Threshold Voltage vs. Junction Temperature



$R_{DS(on)}$ vs. V_{GS}

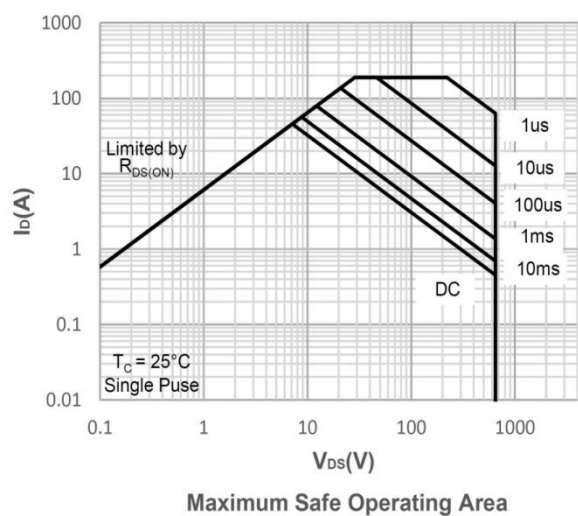
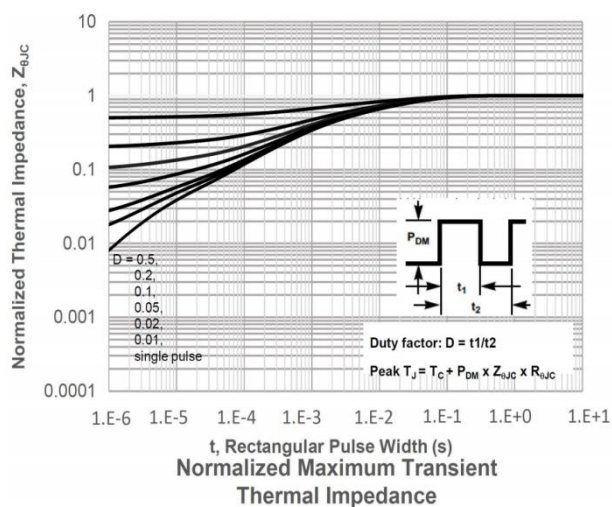


Power De-rating

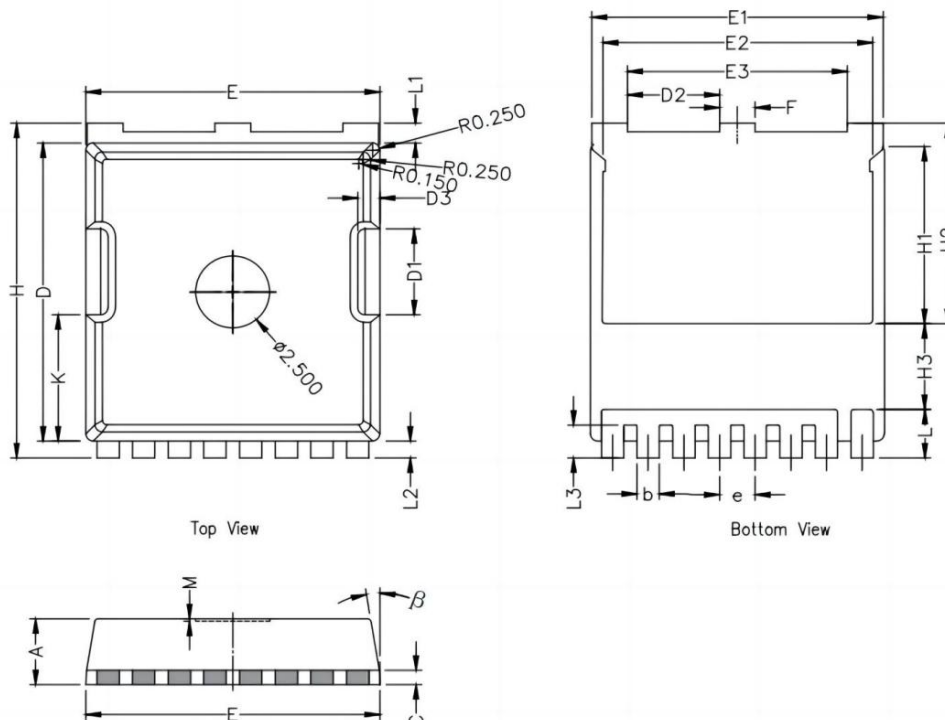


Current De-rating

Typical Characteristics



TOLL Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
b	0.650	0.850	0.026	0.033
C	0.508 REF.		0.020 REF.	
D	10.250	10.550	0.404	0.415
D1	2.850	3.150	0.112	0.124
E	9.750	10.050	0.384	0.396
E1	9.650	9.950	0.380	0.392
E2	8.950	9.250	0.352	0.364
E3	7.250	7.550	0.285	0.297
e	1.200 BSC.		0.047 BSC.	
F	1.050	1.350	0.041	0.053
H	11.550	11.850	0.455	0.467
H1	6.030	6.330	0.237	0.249
H2	6.850	7.150	0.270	0.281
H3	3.000 BSC.		0.118 BSC.	
L	1.550	1.850	0.061	0.073
L1	0.550	0.850	0.022	0.033
L2	0.450	0.750	0.018	0.030
M	0.080 REF.		0.003 REF.	
β	8°	12°	8°	12°
K	4.250	4.550	0.167	0.179