



iM18103

N-Channel Enhancement Mode MOSFET

Datasheet

1. Product Information

1.1 Features

- Surface-mounted Package
- Advanced Trench Cell Design
- RoHS Compliant and Halogen Free
- Reliable and Rugged
- Key Applications: Motor Drivers, DC - DC Converter



1.2 Package Type

PDFN5x6A-EP1

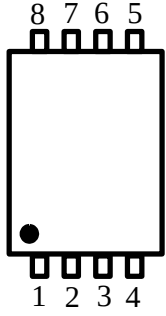
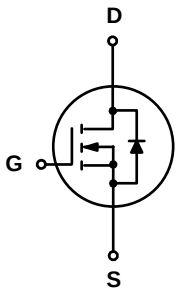
1.3 Quick Reference

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Limiting Values						
P _{tot}	Total Power Dissipation	T _C = 25 °C	-	-	113	W
I _{DS}	Drain-Source Current	T _C = 25 °C, V _{GS} = 10 V	-	-	100	A
		T _C = 100 °C, V _{GS} = 10 V	-	-	63	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	1	-	3	
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} = 10 V, I _{DS} = 20 A	-	4.5	5.6	mΩ
		V _{GS} = 4.5 V, I _D = 10 A	-	8.5	11	

2. Ordering Code & Marking Information

Ordering Code	Marking Information
iM18103	iM18103 XXXXX X : Date Code

3. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source(S)		
4	Gate(G)		
5,6,7,8	Drain(D)		

4. Limiting Values

Symbol	Parameter		Rating	Unit
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate-Source Voltage		± 20	
I_{DS}	Drain-Source Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	100	A
		$T_C = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	63	
I_{DM} ^{Note1}	Pulsed Drain-Source Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	320	A
I_S	Diode Forward Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 0\text{ V}$	100	A
E_{AS}	Single Pulsed Avalanche Energy	$V_{DD} = 50\text{ V}, L = 1.0\text{ mH}$	450	mJ
P_{tot}	Total Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	113	W
$R_{\theta JA}$ ^{Note2}	Thermal Resistance- Junction to Ambient		42.1	$^{\circ}\text{C} / \text{W}$
$R_{\theta JC}$	Thermal Resistance- Junction to Case		1.1	
T_{stg}	Storage Temperature		- 55 ~ 150	$^{\circ}\text{C}$
T_J	Junction Temperature		150	$^{\circ}\text{C}$

5. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _{DS} = 250 μA	100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	1	-	3	
I _{DSS}	Drain Leakage Current	V _{DS} = 80 V, V _{GS} = 0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} = ± 20 V, V _{DS} = 0 V	-	-	± 100	nA
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} = 10 V, I _{DS} = 20 A	-	4.5	5.6	mΩ
		V _{GS} = 4.5 V, I _{DS} = 10 A	-	8.5	11	
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} = 20 A, V _{GS} = 0 V	-	-	1.3	V
t _{rr} ^{Note3}	Reverse Recovery Time	I _{SD} = 20 A, dI _{SD} /dt = 100 A/μs	-	61	-	nS
Q _{rr} ^{Note3}	Reverse Recovery Charge		-	84	-	nC
Dynamic Characteristics ^{Note3}						
C _{iSS}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 50 V f = 1 MHz	-	3071	-	pF
C _{oSS}	Output Capacitance		-	486	-	
C _{rSS}	Reverse Transfer Capacitance		-	39	-	
R _{g(int)}	Internal Gate Resistance	V _{GS} = 0 V, V _{DS} = 0 V, f = 1 MHz	-	1	-	Ω
t _{d(on)}	Turn-on Delay Time	V _{DS} = 50 V, V _{GEN} = 10 V, R _{g(ext)} = 3.9 Ω, R _L = 2.5 Ω, I _{DS} = 20 A	-	12	-	nS
t _r	Turn-on Rise Time		-	25	-	
t _{d(off)}	Turn-off Delay Time		-	47	-	
t _f	Turn-off Fall Time		-	29	-	
Gate Charge Characteristics ^{Note3}						
Q _g	Total Gate Charge	V _{DS} = 50 V, V _{GS} = 10 V, I _{DS} = 20 A	-	51	-	nC
Q _{gs}	Gate-Source Charge		-	15	-	
Q _{gd}	Gate-Drain Charge		-	14	-	

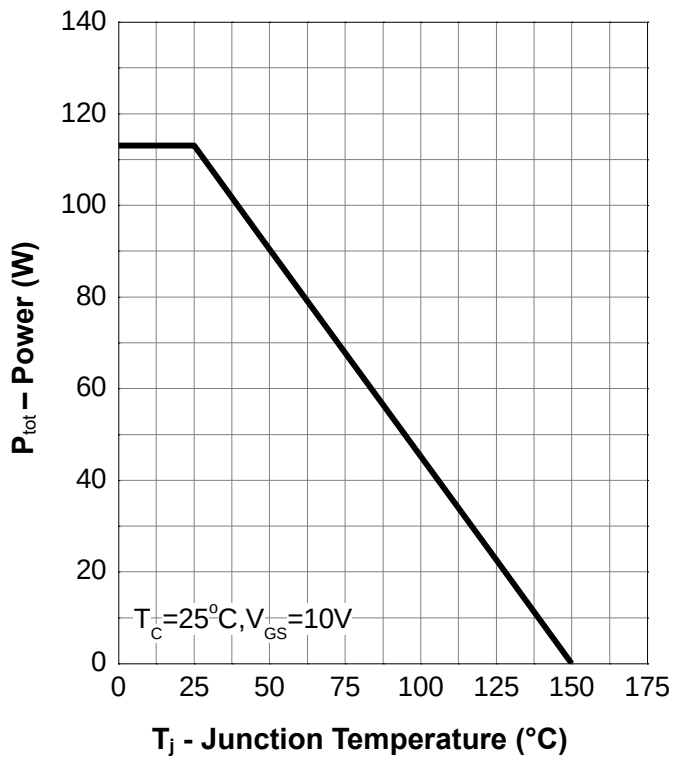
Note 1: Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

Note 2: Surface Mounted on 1 in² pad area, t ≤ 10 sec.

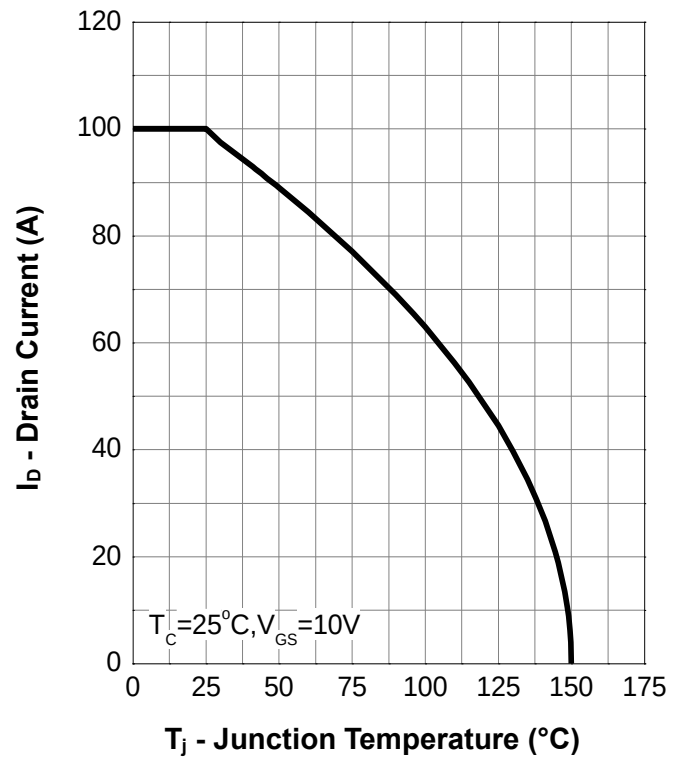
Note 3: Guaranteed by design, not subject to production testing.

6. Typical Characteristics

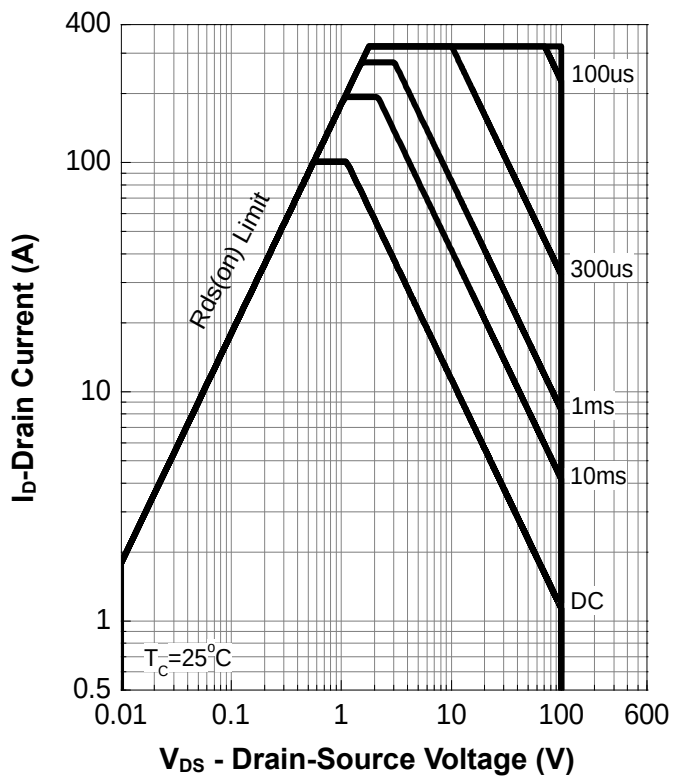
Power Capability



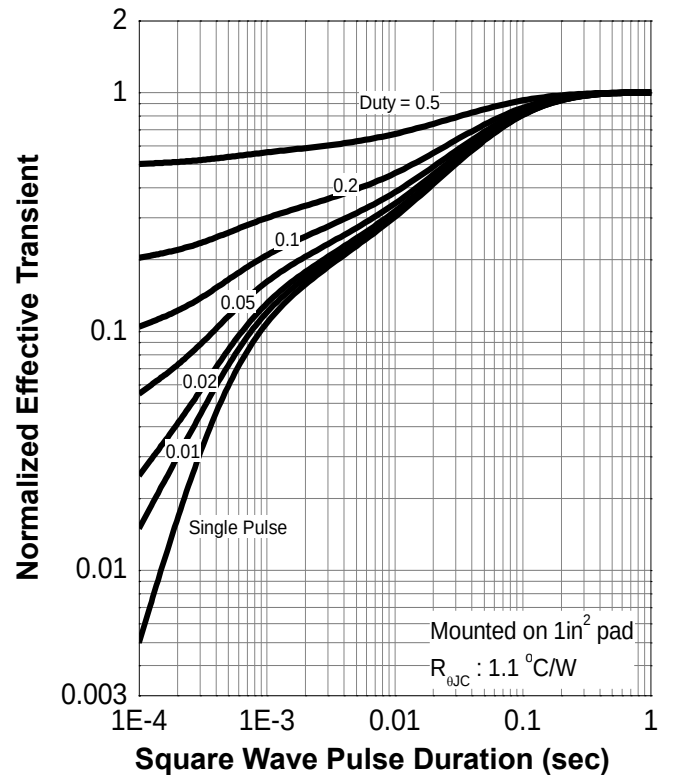
Current Capability



Safe Operation Area

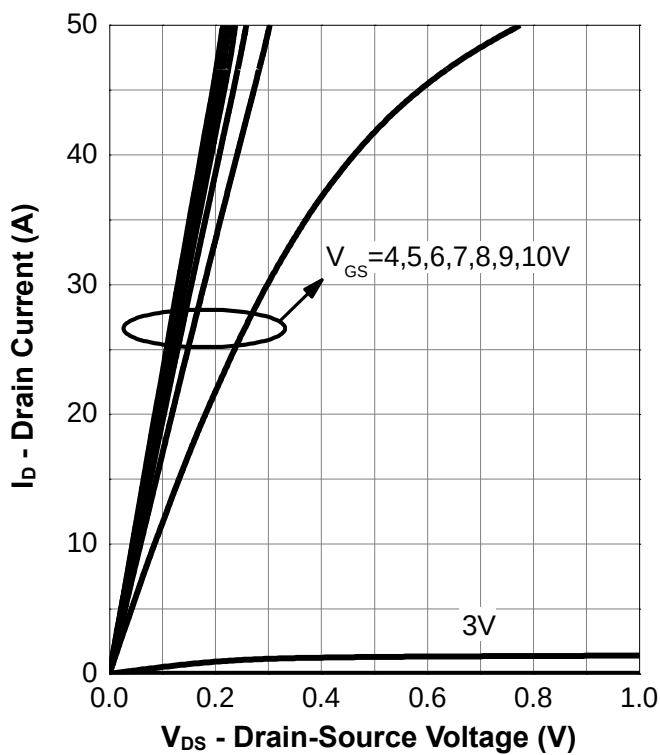


Transient Thermal Impedance

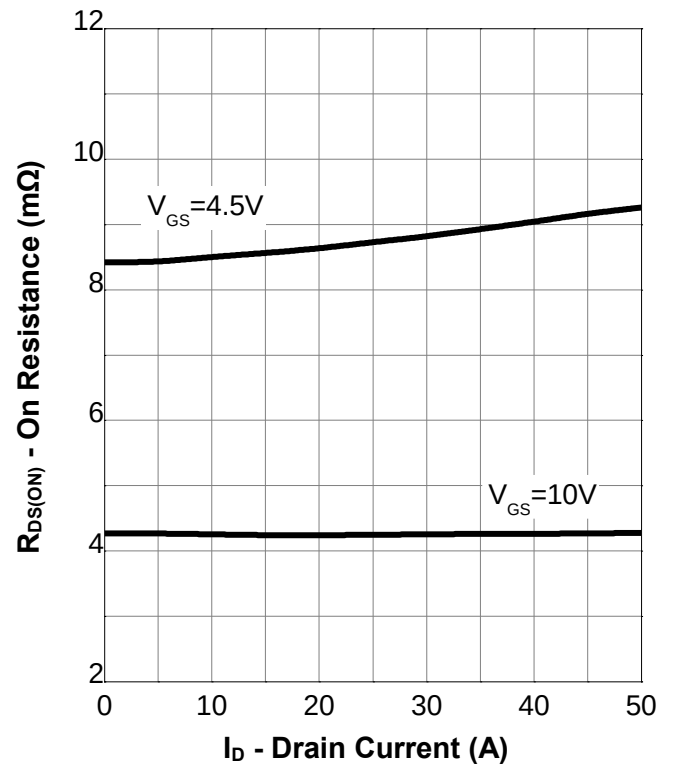


6. Typical Characteristics (cont.)

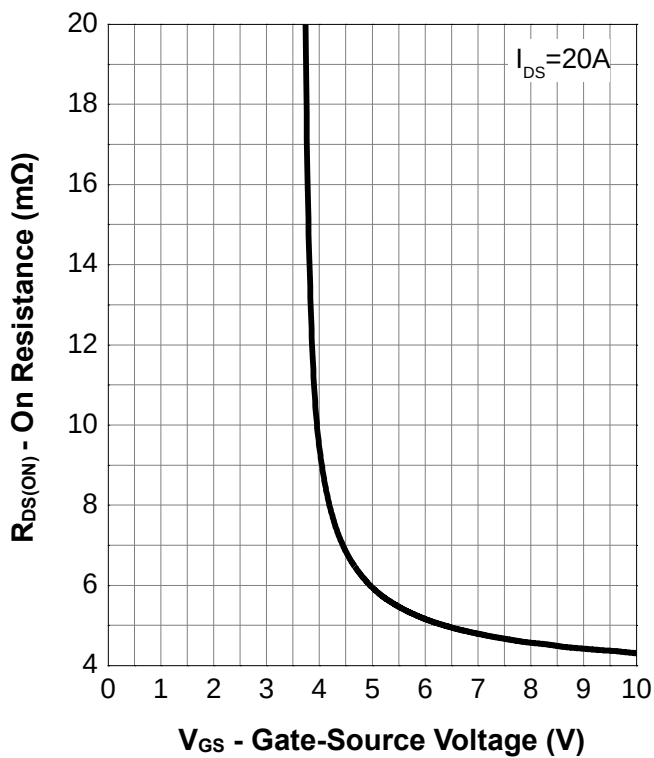
Output Characteristics



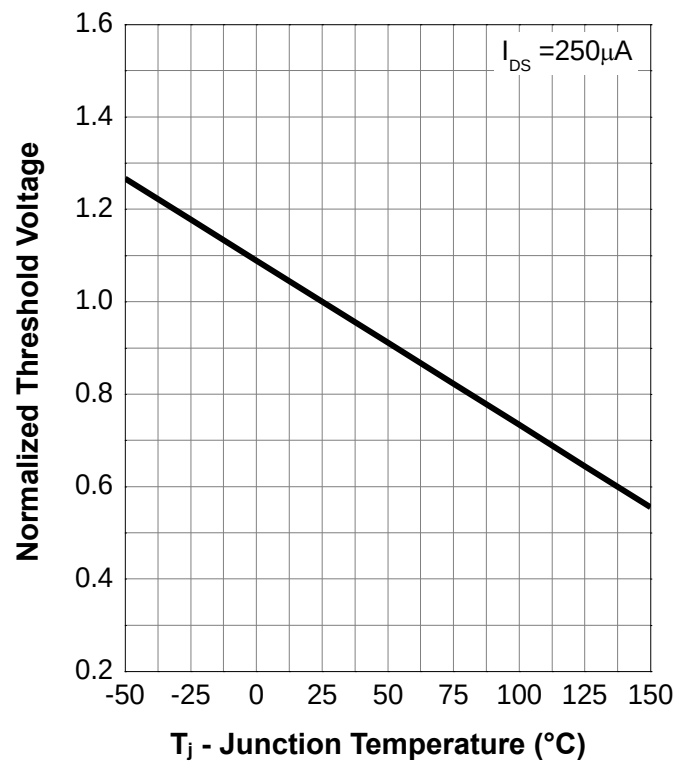
On Resistance



Transfer Characteristics

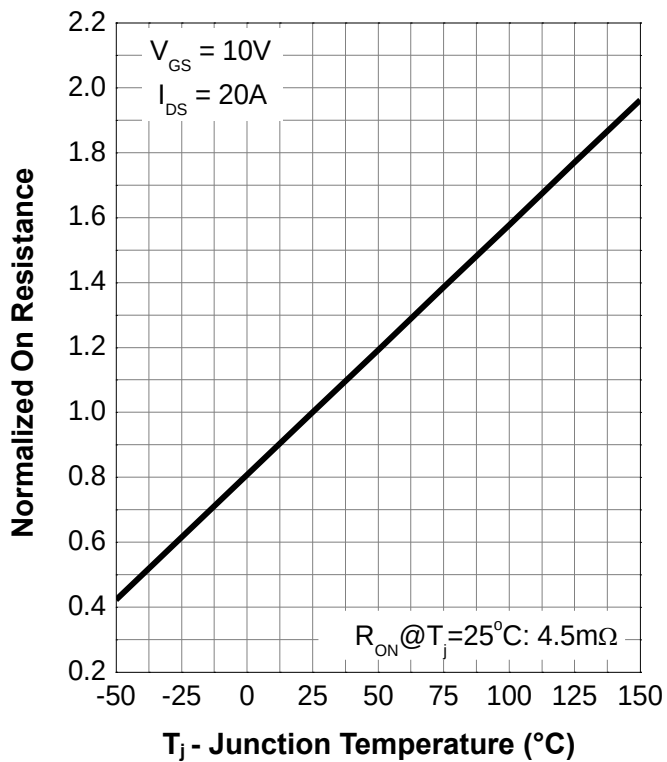


Normalized Threshold Voltage

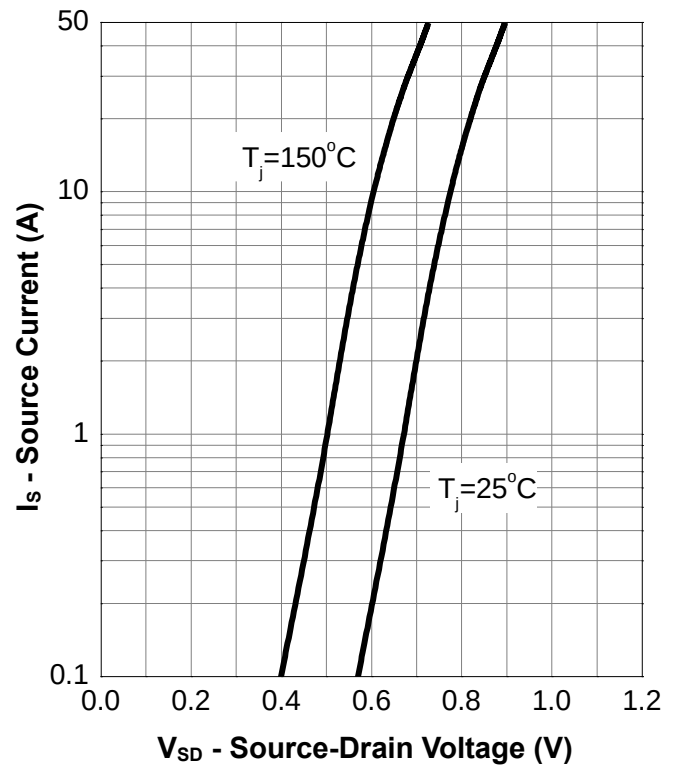


6. Typical Characteristics (cont.)

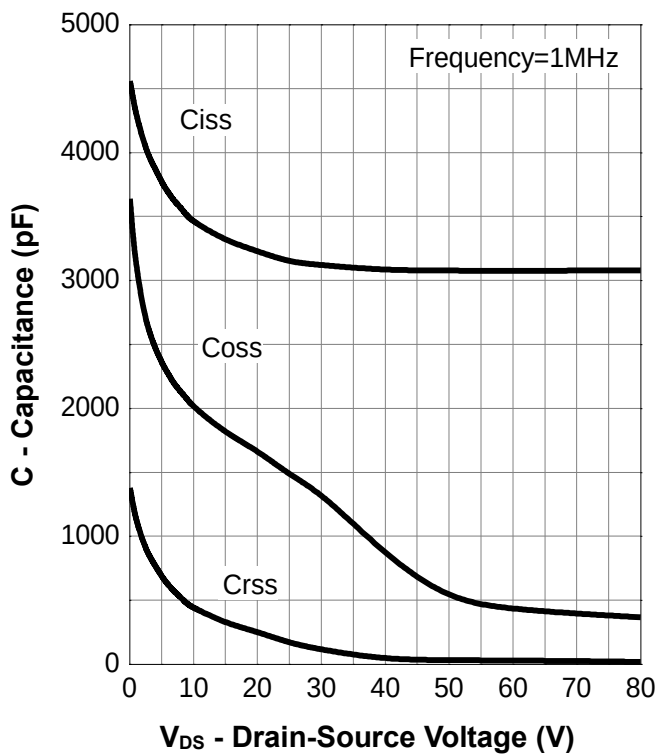
Normalized On Resistance



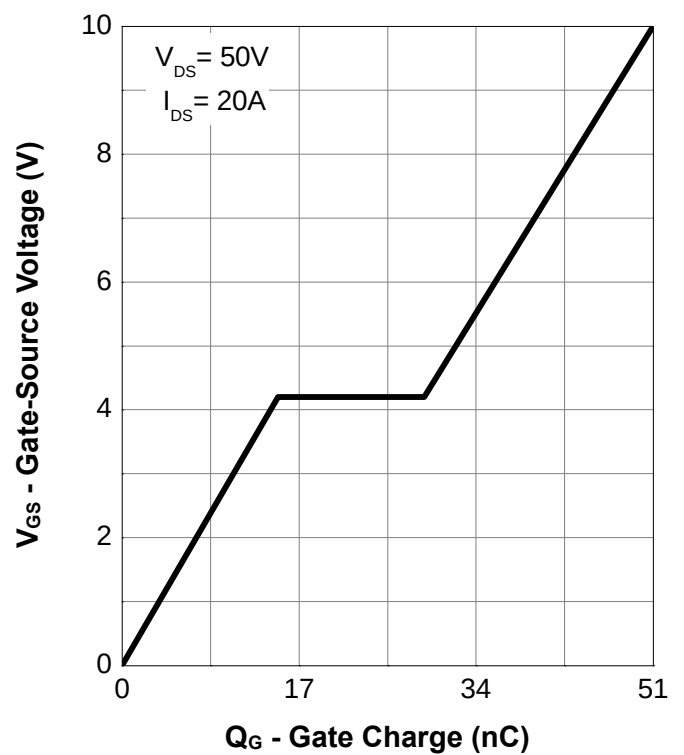
Diode Forward Current



Capacitance



Gate Charge



Important Notice

1. inergy Technology Inc. reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete.
2. The Products of inergy Technology Inc. have been tested, verified and passed by our specifications and standards, and are 100% inspected before delivery from the factory. It is strongly recommended that the customers shall perform verifications of the functionality, compatibility, and reliability of the environment or platform that you used. inergy Technology Inc. would not be liable for or guarantee anything that is related to the functionality, compatibility, and reliability of the environment or platform used by the customers.