



iMN03N10GM

N-Channel Enhancement Mode MOSFET

Datasheet

1. Product Information

1.1 Features

- Advanced Trench Cell Design
- RoHS Compliant and Halogen Free
- Reliable and Rugged
- Moisture Sensitivity Level MSL1



1.2 Package Type

PDFN5X6B-EP1-8L

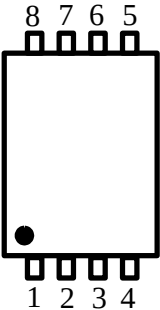
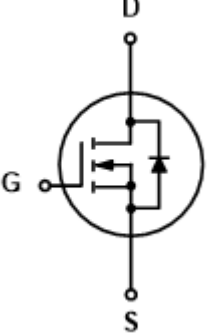
1.3 Quick Reference

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Limiting Values						
P_{tot}	Total Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	-	-	65	W
I_D	Drain Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	-	90	A
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown	$V_{GS} = 0\text{ V}, I_{DS} = 250\text{ }\mu\text{A}$	100	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\text{ }\mu\text{A}$	1	-	3	V
$R_{DS(on)}$	On-State Resistance	$V_{GS} = 10\text{ V}, I_{DS} = 20\text{ A}$	-	2.9	3.4	m Ω
		$V_{GS} = 4.5\text{ V}, I_{DS} = 10\text{ A}$	-	4.2	4.8	

2. Ordering Code & Marking Information

Ordering Code	Marking Information
iMN03N10GM	03N10M XXXXXX X : Date Code

3. Pin Description

Pin	Description	Simplified Outline	Symbol
1~3	Source(S)		
4	Gate(G)		
5~8	Drain(D)		

4. Limiting Values

Symbol	Parameter		Rating	Unit
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate-Source Voltage		± 20	V
I_D	Drain Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	90	A
		$T_C = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	68	A
		$T_A = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	20	A
		$T_A = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	14	A
I_{DM} Note1	Pulsed Source Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	320	A
I_S	Diode Forward Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 0\text{ V}$	90	A
E_{AS}	Single Pulsed Avalanche Energy	$L = 1.0\text{ mH}, V_{DD} = 50\text{ V}$	125	mJ
P_{tot}	Total Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	65	W
$R_{\theta JA}$ Note2	Thermal Resistance- Junction to Ambient		62.5	$^{\circ}\text{C} / \text{W}$
$R_{\theta JC}$	Thermal Resistance- Junction to Case		2.3	$^{\circ}\text{C} / \text{W}$
T_{stg}	Storage Temperature		- 55 ~ 175	$^{\circ}\text{C}$
T_J	Junction Temperature		175	$^{\circ}\text{C}$

5. Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown	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	V
I _{DSS}	Drain Leakage Current	V _{DS} = 80 V, V _{GS} = 0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	± 100	nA
R _{DS(ON)}	On-State Resistance	V _{GS} = 10 V, I _{DS} = 20 A	-	2.9	3.4	mΩ
		V _{GS} = 4.5 V, I _{DS} = 10 A	-	4.2	4.8	
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 _{DS} = 20 A, V _{GS} = 0 V	-	84	-	nS
Q _{rr} Note3	Reverse Recovery Charge		dI _{SD} /dt = 100 A/μs	-	151	-
Dynamic Characteristics Note3						
C _{iSS}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 50 V Frequency = 1 MHz	-	4808	-	pF
C _{oSS}	Output Capacitance		-	768	-	
C _{rSS}	Reverse Transfer Capacitance		-	53	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 50 V, V _{GEN} = 10 V, R _G = 4.5 Ω, R _L = 2.5 Ω, I _{DS} = 20 A	-	13	-	nS
t _r	Turn-on Rise Time		-	27	-	
t _{d(off)}	Turn-off Delay Time		-	77	-	
t _f	Turn-off Fall Time		-	47	-	
Gate Charge Characteristics Note3						
Q _g	Total Gate Charge	V _{DS} = 50 V, V _{GS} = 10 V, I _{DS} = 20 A	-	96	-	nC
Q _{gs}	Gate-Source Charge		-	18	-	
Q _{gd}	Gate-Drain Charge		-	23	-	

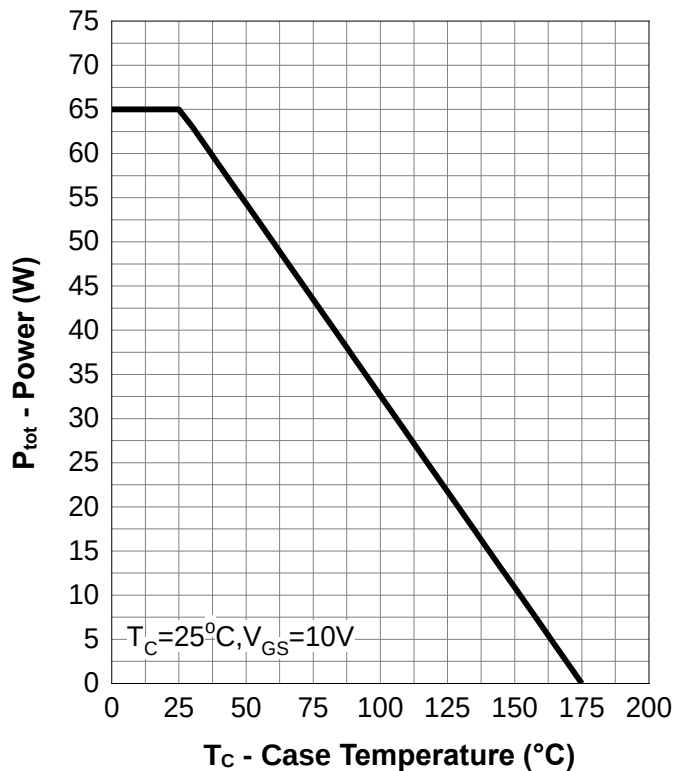
Note 1: Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

Note 2: Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$.

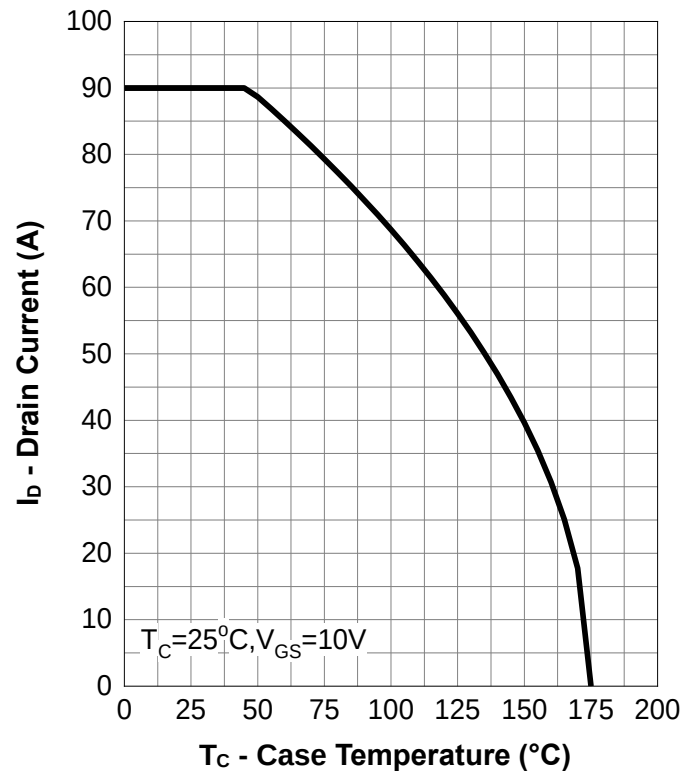
Note 3: Guaranteed by design, not subject to production testing.

6. Typical Characteristics

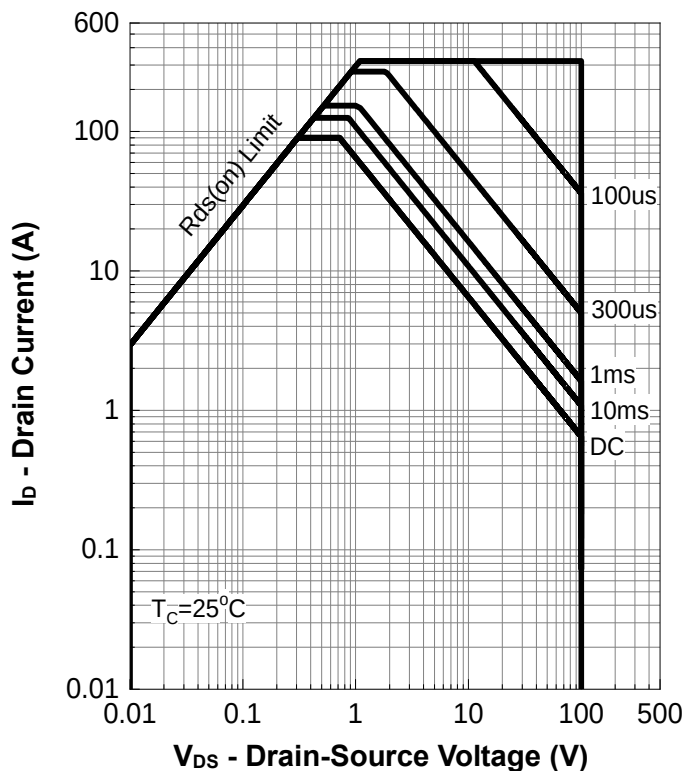
Power Capability



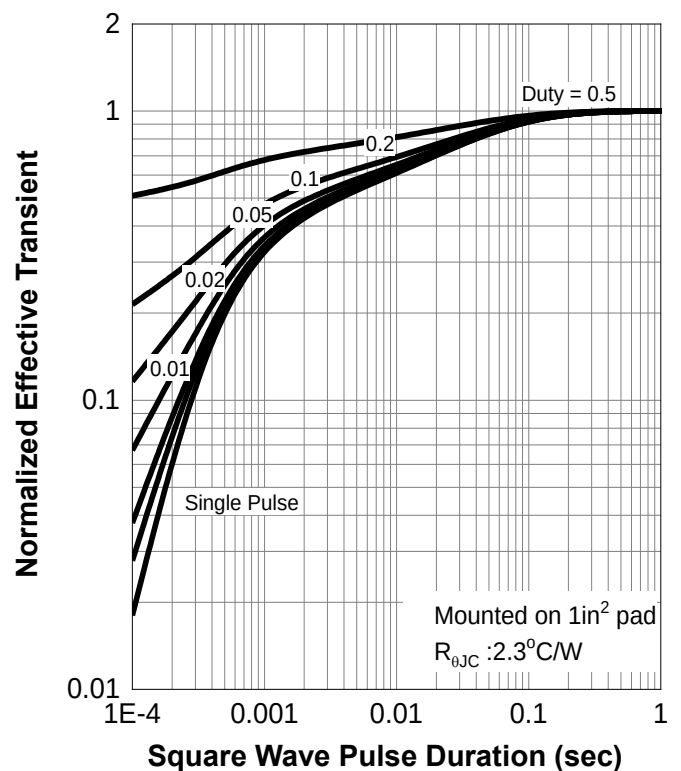
Current Capability



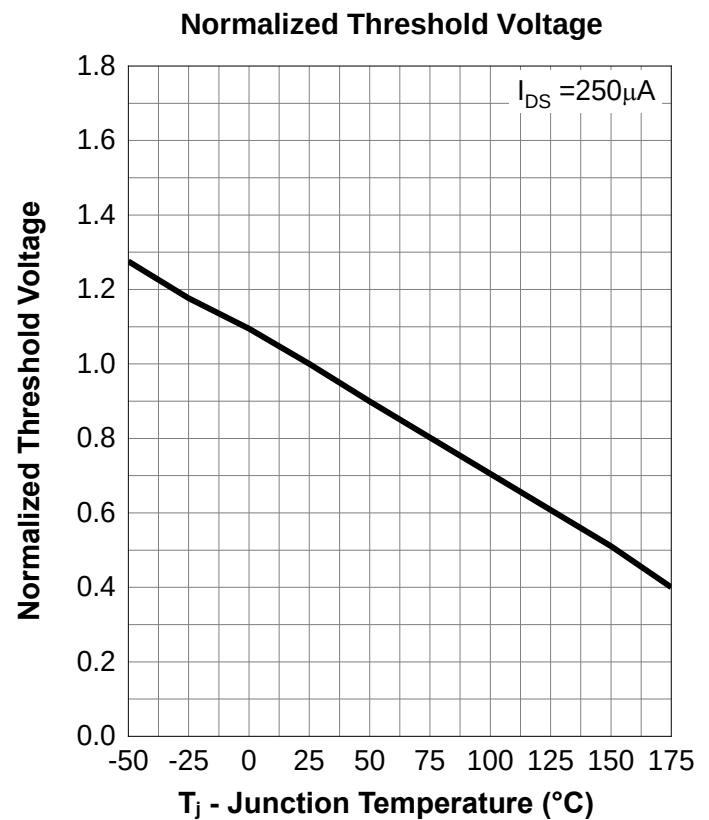
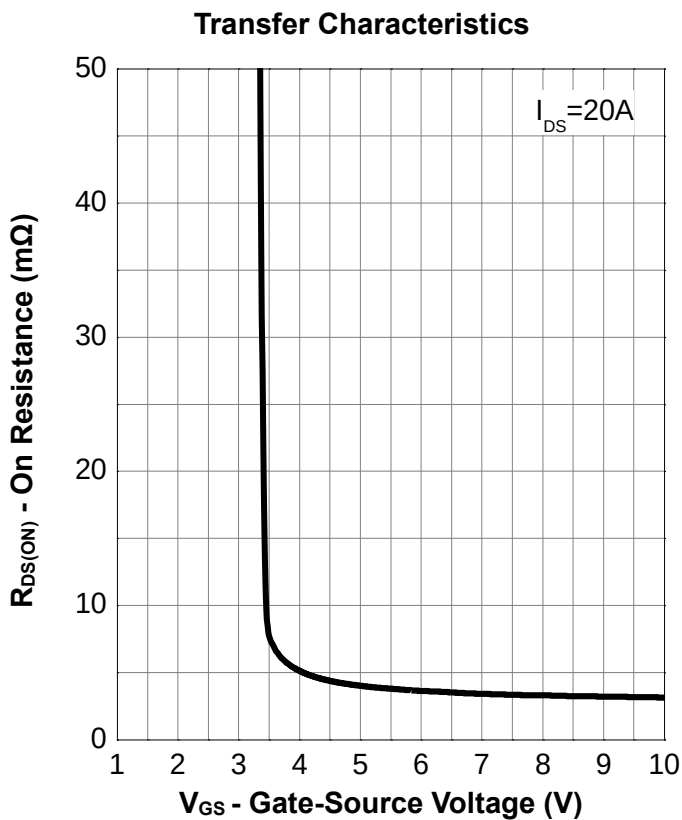
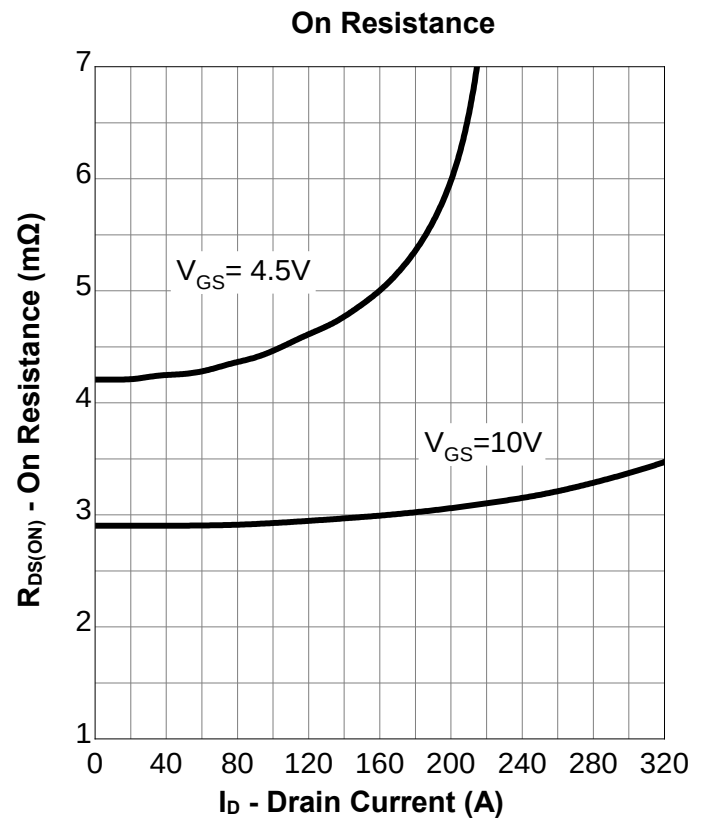
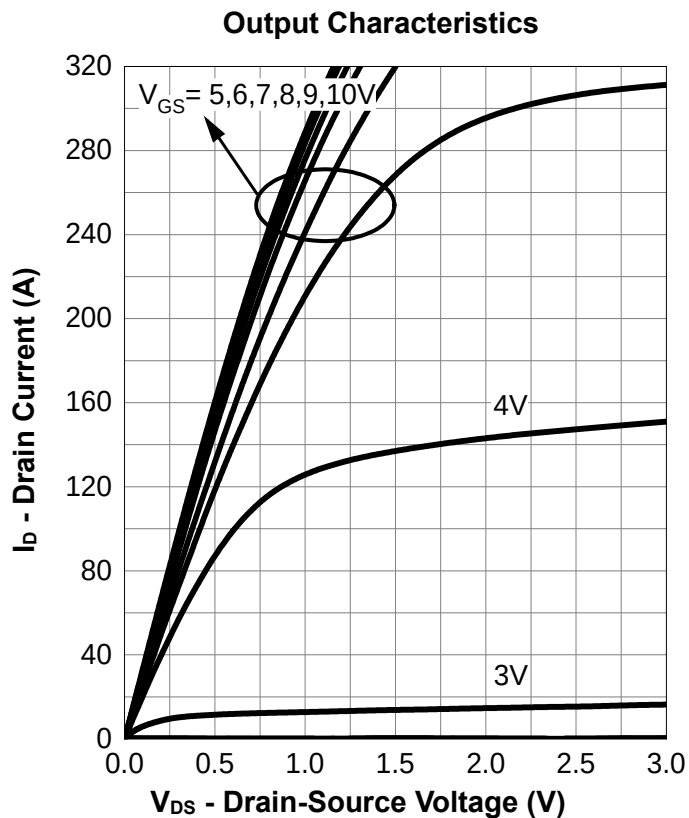
Safe Operating Area



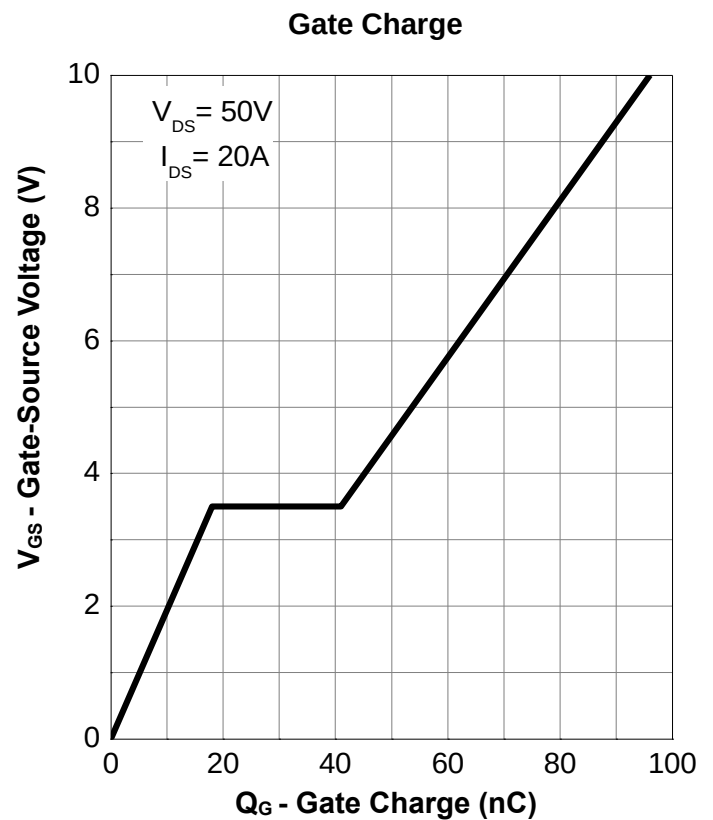
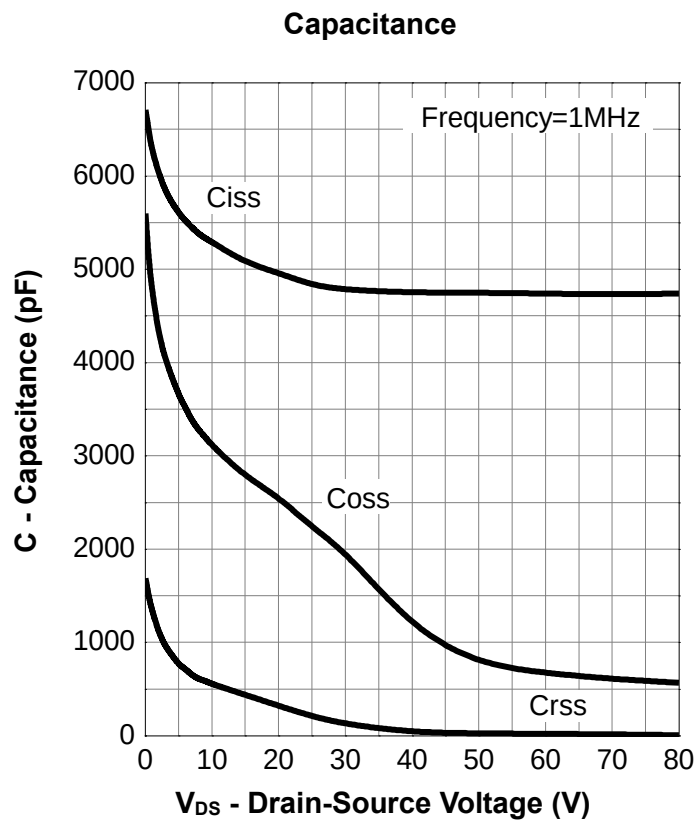
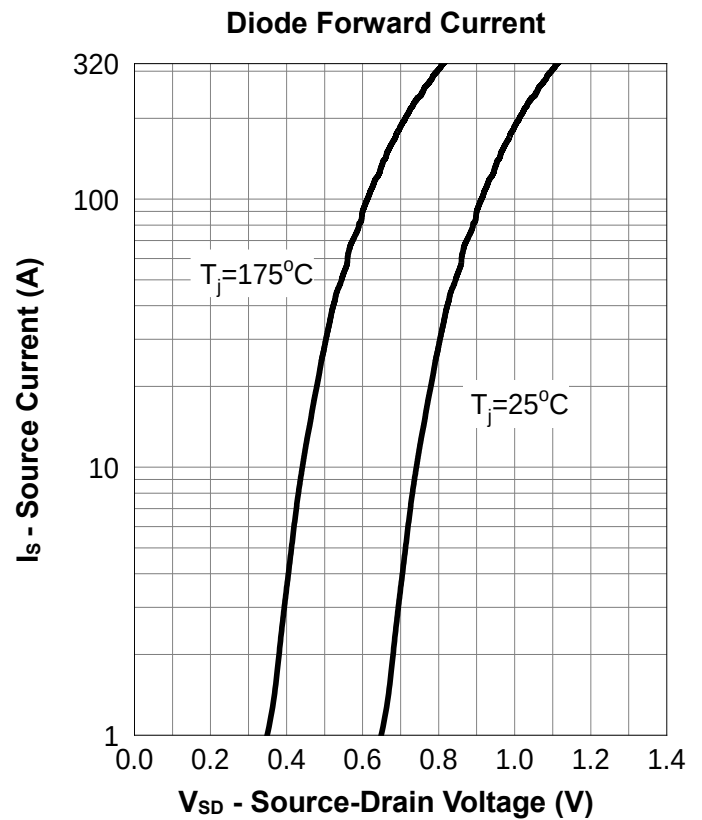
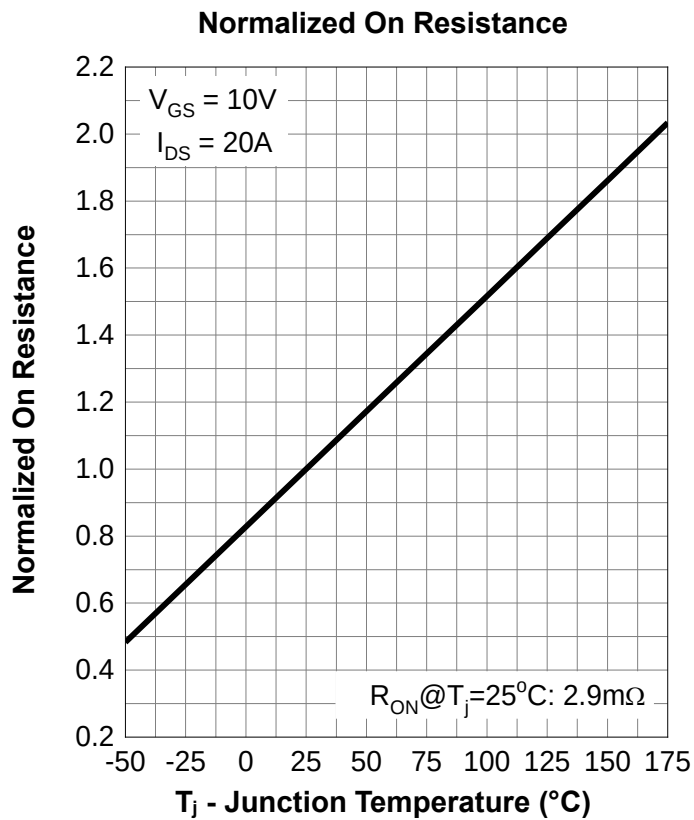
Transient Thermal Impedance



6. Typical Characteristics



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