

General Description

The CMS4612 uses advanced trench technology MOSFETs to provide excellent RDS(ON) and low gate charge. The complementary MOSFETs may be used in H-bridge, Inverters and other applications.

Features

- Dual N and P Channel MOSFET
- Surface mount Package
- Reliable and Rugged
- Simple Drive Requirement
- Low On-resistance

Absolute Maximum Ratings

Symbol	Parameter	Max n-channel	Max p-channel	Units
V_{DS}	Drain-Source Voltage	60	-60	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current ¹	4.5	-3.2	A
I_{DM}	Pulsed Drain Current ²	20	-20	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation	2	2	W
T_{STG}	Storage Temperature Range	-55 to 150	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	-55 to 150	$^\circ C$

Thermal Characteristics: n-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient (Steady-State) ¹	---	110	$^\circ C/W$
$R_{\theta JL}$	Maximum Junction-to-Lead (Steady-State) ³	---	60	$^\circ C/W$

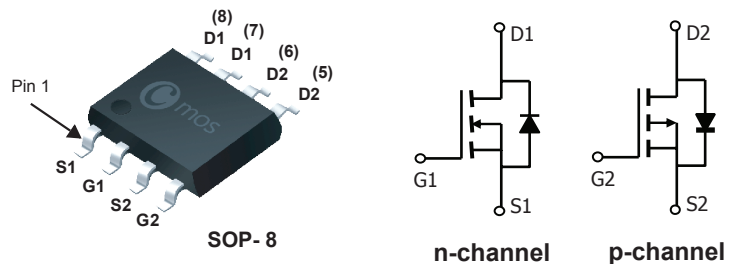
Product Summary

	BVDSS	RDSON	ID
N-Channel	60V	56m Ω	4.5A
P-Channel	-60V	105m Ω	-3.2A

Applications

- Power Management
- DC/DC Converter
- Power Management in FAN, LCD Inverter Systems

SOP-8 Pin Configuration



Type	Package	Marking
CMS4612	SOP- 8	4612

Thermal Characteristics: p-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient (Steady-State) ¹	---	110	°C/W
$R_{\theta JL}$	Maximum Junction-to-Lead (Steady-State) ³	---	40	°C/W

N Channel Electrical Characteristics (T_J=25°C unless otherwise noted)

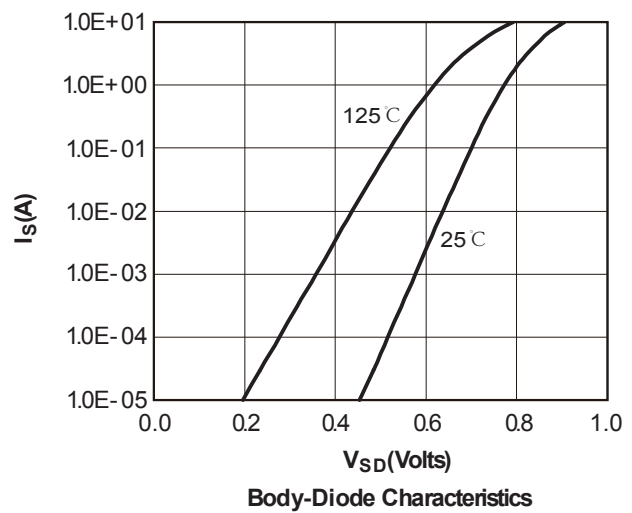
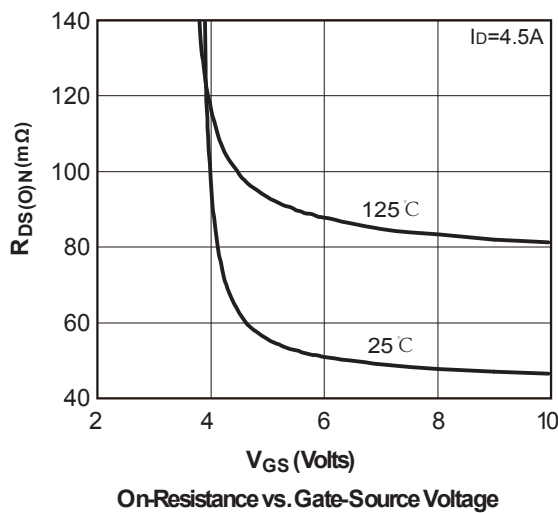
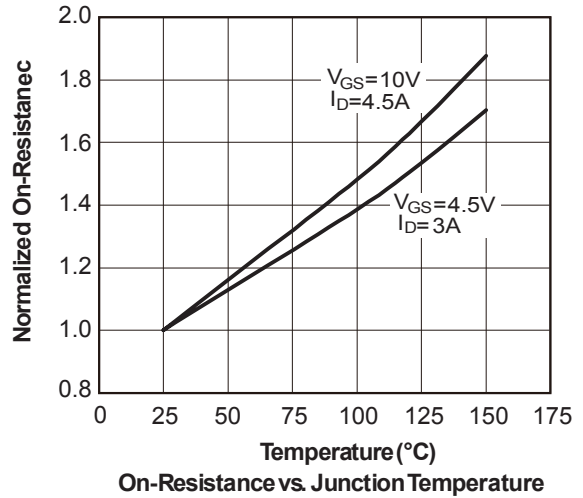
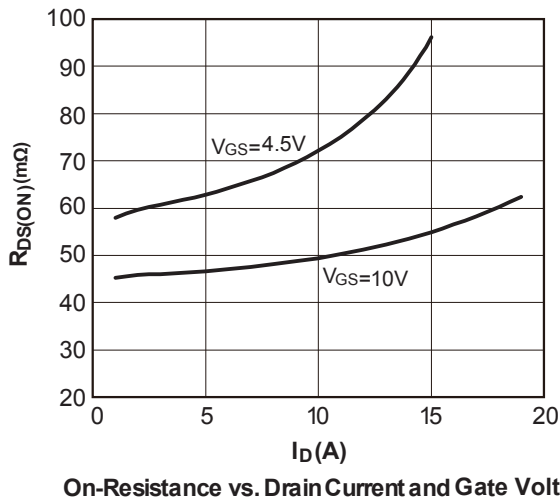
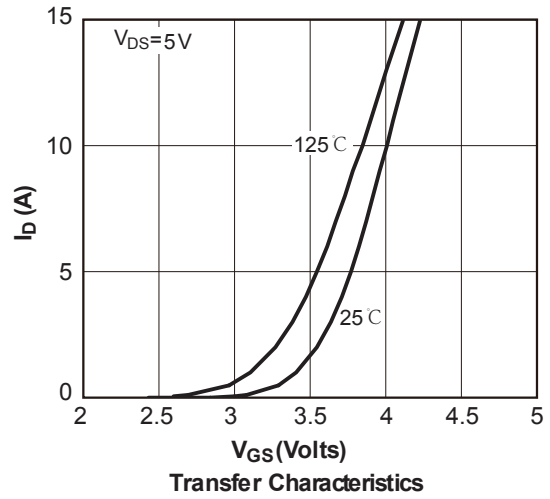
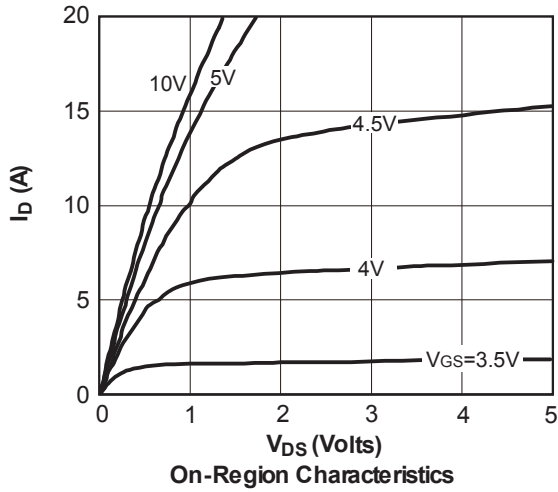
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=4.5A$	---	---	56	mΩ
		$V_{GS}=4.5V, I_D=3A$	---	---	77	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=48V, V_{GS}=0V$	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=4.5A$	---	11	---	S
Q_g	Total Gate Charge (10V)	$V_{DS}=30V, V_{GS}=10V, I_D=4.5A$	---	9	---	nC
Q_{gs}	Gate-Source Charge		---	1.5	---	
Q_{gd}	Gate-Drain Charge		---	2.5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=30V, V_{GS}=10V, R_L=6.7\Omega$ $R_{GEN}=3\Omega$	---	6	---	ns
T_r	Rise Time		---	3	---	
$T_{d(off)}$	Turn-Off Delay Time		---	18	---	
T_f	Fall Time		---	2	---	
C_{iss}	Input Capacitance	$V_{DS}=30V, V_{GS}=0V, f=1MHz$	---	480	---	pF
C_{oss}	Output Capacitance		---	60	---	
C_{rss}	Reverse Transfer Capacitance		---	20	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t_{rr}	Body Diode Reverse Recovery Time	$I_F=4.5A, di/dt=100A/\mu s$	---	27.5	---	ns
Q_{rr}	Body Diode Reverse Recovery Charge		---	32	---	nC
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A$	---	---	1	V

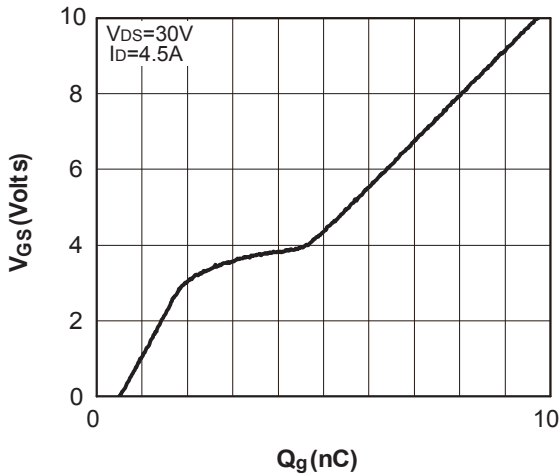
Typical Characteristics

N- and P-Channel Enhancement Mode MOSFET

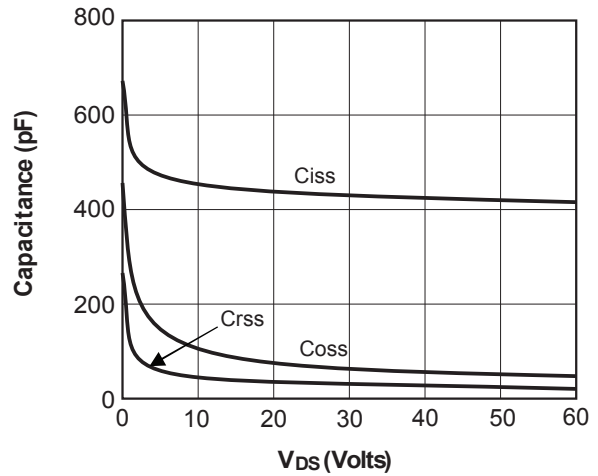


Typical Characteristics

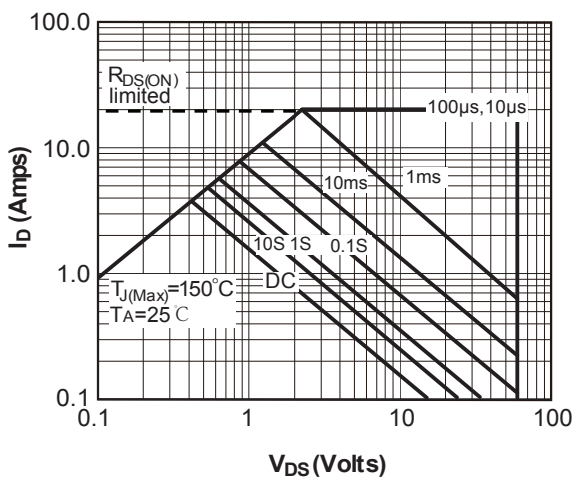
N- and P-Channel Enhancement Mode MOSFET



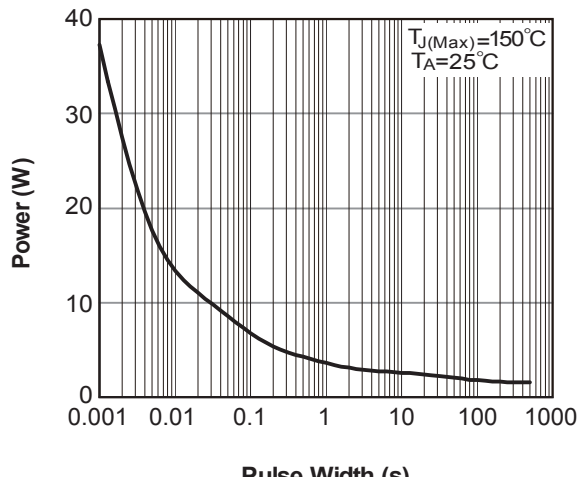
Gate-Charge Characteristics



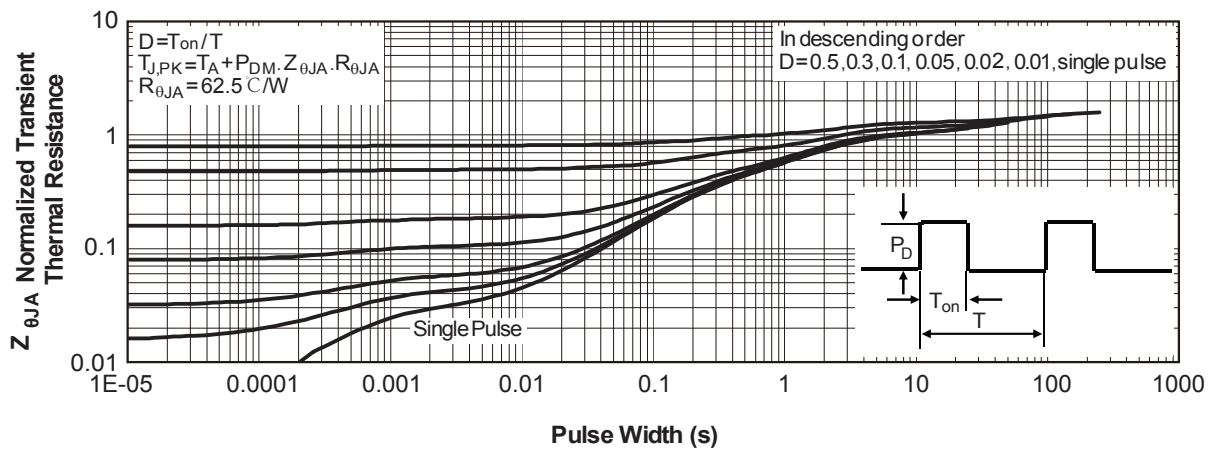
Capacitance Characteristics



Maximum Forward Biased Safe Operating Area



Single Pulse Power Rating Junction-to-Ambient



Normalized Maximum Transient Thermal Impedance

P Channel Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =-250μA	-60	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V , I _D =-3.2A	---	---	105	mΩ
		V _{GS} =-4.5V , I _D =-2.8A	---	---	135	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-1	---	-3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-48V , V _{GS} =0V	---	---	-1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V , I _D =-3.2A	---	9	---	S
Q _g	Total Gate Charge (10V)	V _{DS} =-30V , V _{GS} =-10V , I _D =-3.2A	---	18	---	nC
Q _{gs}	Gate-Source Charge		---	3	---	
Q _{gd}	Gate-Drain Charge		---	3.2	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =-30V , V _{GS} =-10V , R _L =9.4Ω R _{GEN} =3Ω	---	10	---	ns
T _r	Rise Time		---	4	---	
T _{d(off)}	Turn-Off Delay Time		---	35	---	
T _f	Fall Time		---	7	---	
C _{iss}	Input Capacitance	V _{DS} =-30V , V _{GS} =0V , f=1MHz	---	900	---	pF
C _{oss}	Output Capacitance		---	100	---	
C _{rss}	Reverse Transfer Capacitance		---	40	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t _{rr}	Body Diode Reverse Recovery Time	I _F =-3.2A , di/dt=100A/μs	---	27	---	ns
Q _{rr}	Body Diode Reverse Recovery Charge		---	32	---	nC
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =-1A	---	---	-1	V

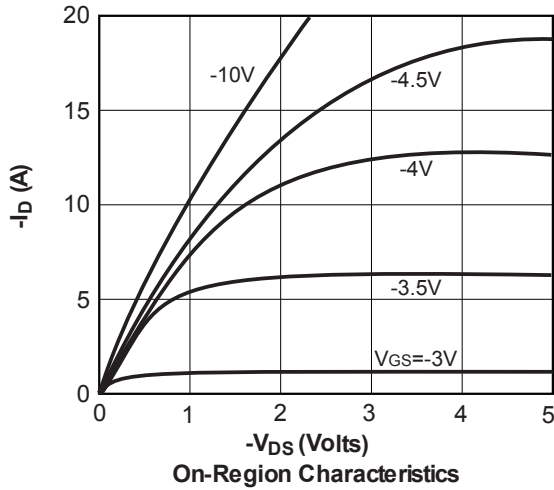
Note :

- 1: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A =25 . The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.
- 2: Repetitive rating, pulse width limited by junction temperature.
3. The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

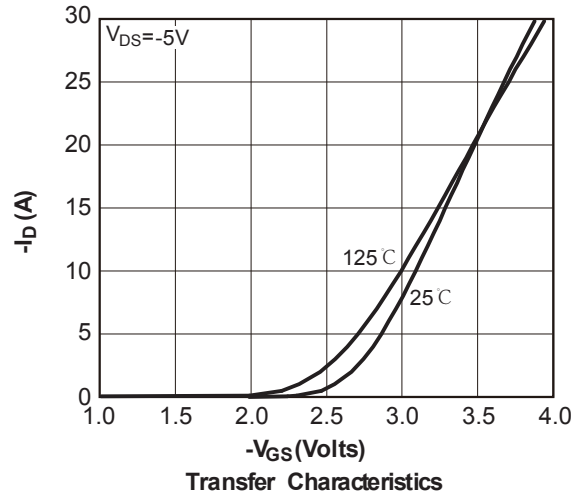
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 Cmos assumes no liability for customers' product design or applications.
 Cmos reserves the right to improve product design ,functions and reliability without notice.

Typical Characteristics

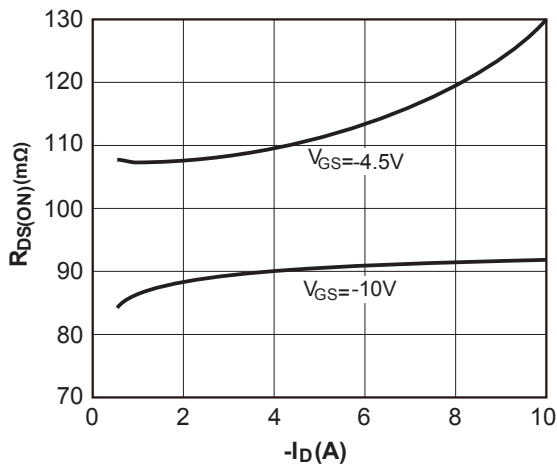
N- and P-Channel Enhancement Mode MOSFET



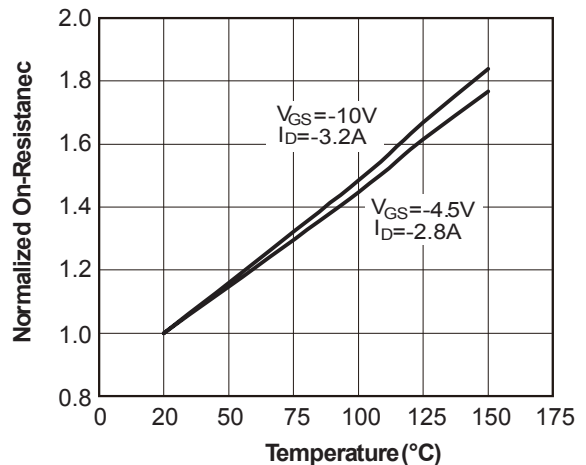
On-Region Characteristics



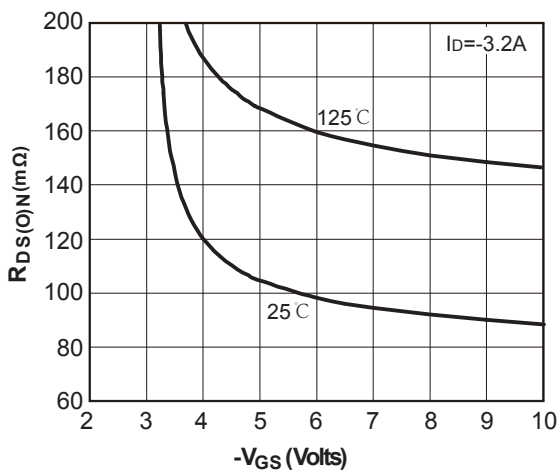
Transfer Characteristics



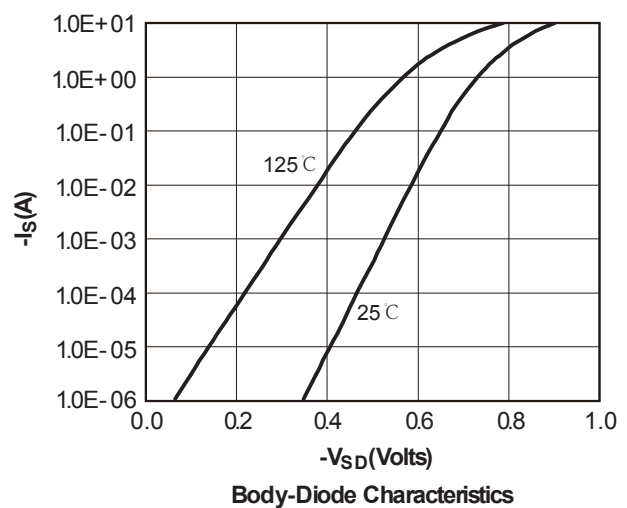
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Junction Temperature

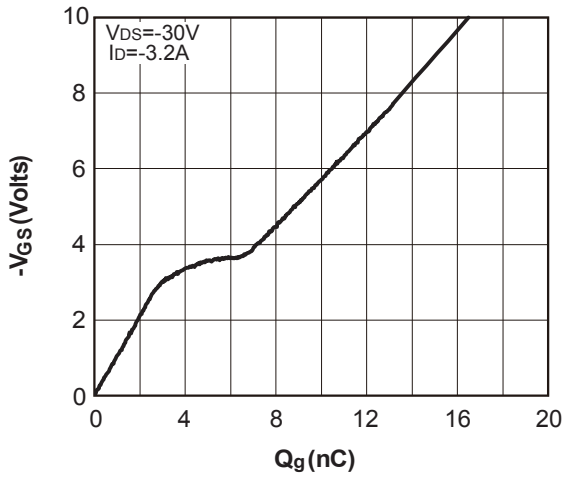


On-Resistance vs. Gate-Source Voltage

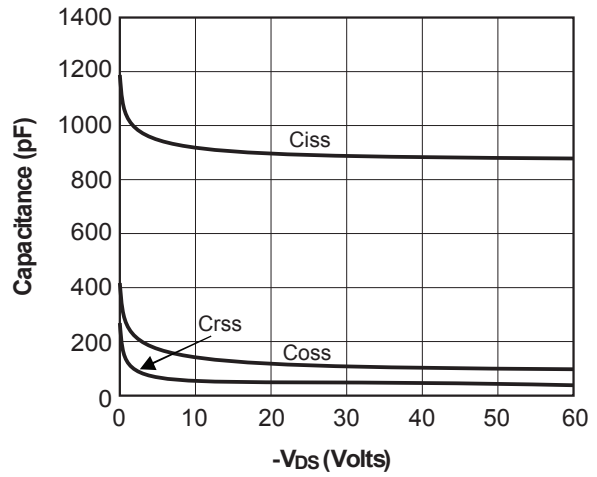


Body-Diode Characteristics

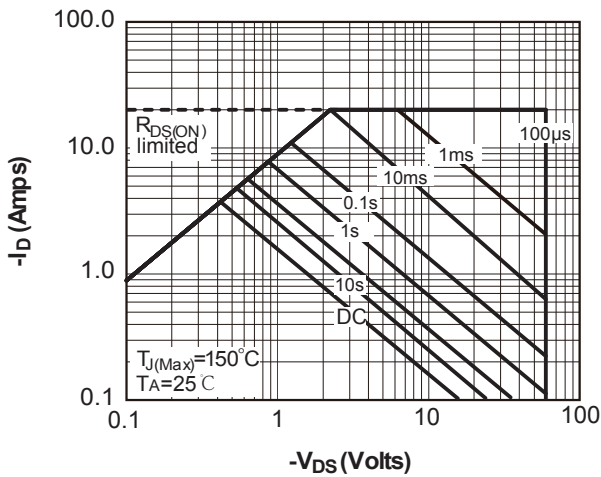
Typical Characteristics



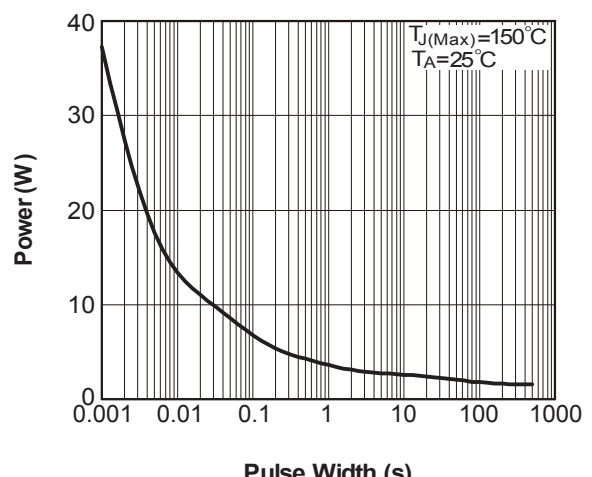
Gate-Charge Characteristics



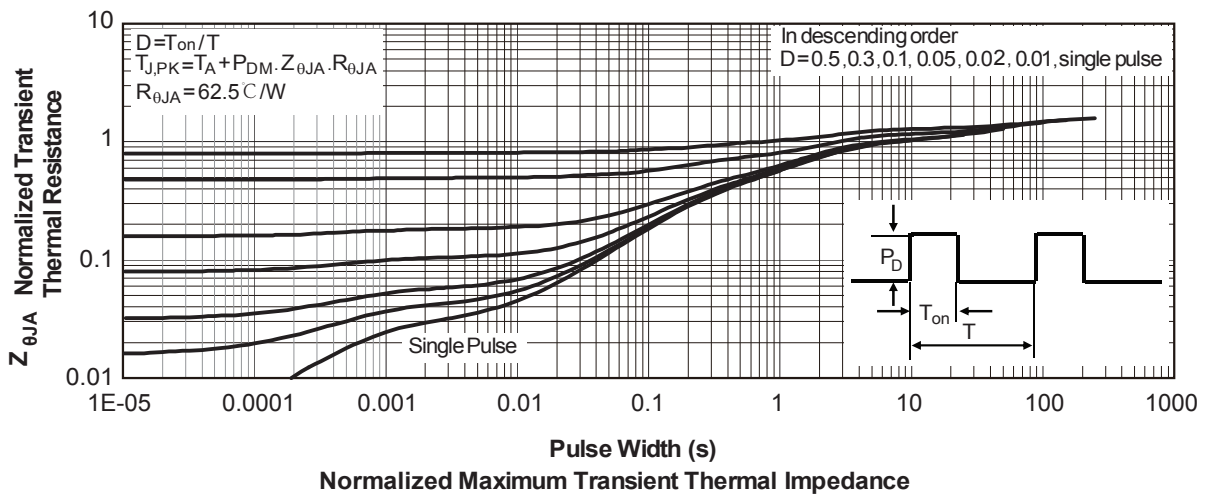
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