

General Description

The P3004ND5G 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

- 30V 16A RDS(ON)≤20mΩ @ VGS=10V
RDS(ON)≤40mΩ @ VGS=4.5V
- -30V -16A RDS(ON)≤20mΩ @ VGS=10V
RDS(ON)≤25mΩ @ VGS=4.5V
- High Density Cell Design For Ultra Low On Resistance

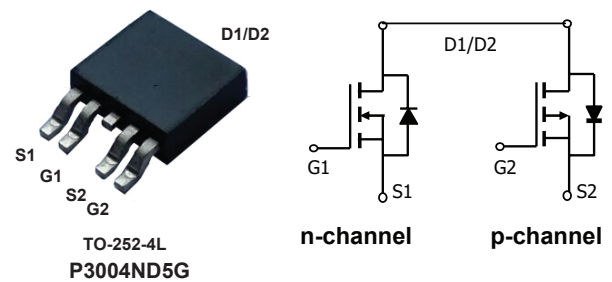
Product Summary

	BVDSS	RDSON	ID
N-Channel	30V	20mΩ	16A
P-Channel	-30V	20mΩ	-16A

Applications

- Power Management
- Load Switch
- DC/DC Converter

TO-252-4L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Max n-channel	Max p-channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	±20	±20	V
$I_D@T_C=25^{\circ}\text{C}$	Continuous Drain Current	16	-16	A
I_{DM}	Pulsed Drain Current	48	-48	A
$P_D@T_C=25^{\circ}\text{C}$	Power Dissipation	25	25	W
T_{STG}	Storage Temperature Range	-55 to 150	-55 to 150	$^{\circ}\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics: n-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient (Steady-State)	---	60	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Maximum Junction-to-Case (Steady-State)	---	6	$^{\circ}\text{C/W}$

N- and P-Channel Enhancement Mode MOSFET

Thermal Characteristics: p-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient (Steady-State)	---	60	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Maximum Junction-to-Case (Steady-State)	---	6	$^{\circ}\text{C/W}$

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

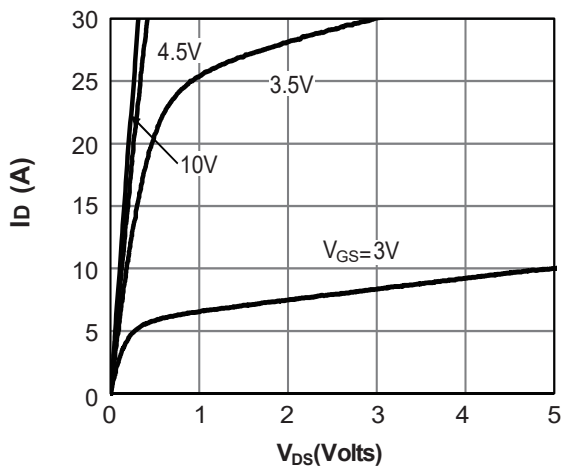
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=11A$	---	17	20	$m\Omega$
		$V_{GS}=4.5V$, $I_D=5.5A$	---	28	40	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=24V$, $V_{GS}=0V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	100	nA
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_D=7.5A$	---	4	---	S
Q_g	Total Gate Charge (10V)	$V_{DS}=15V$, $V_{GS}=10V$, $I_D=12A$	---	20	---	nC
Q_{gs}	Gate-Source Charge		---	3	---	
Q_{gd}	Gate-Drain Charge		---	4	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V$, $V_{GS}=10V$, $R_L=1.25\Omega$ $R_{GEN}=3\Omega$	---	10	---	ns
T_r	Rise Time		---	5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	25	---	
T_f	Fall Time		---	7	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1MHz$	---	650	---	pF
C_{oss}	Output Capacitance		---	100	---	
C_{rss}	Reverse Transfer Capacitance		---	50	---	

Diode Characteristics

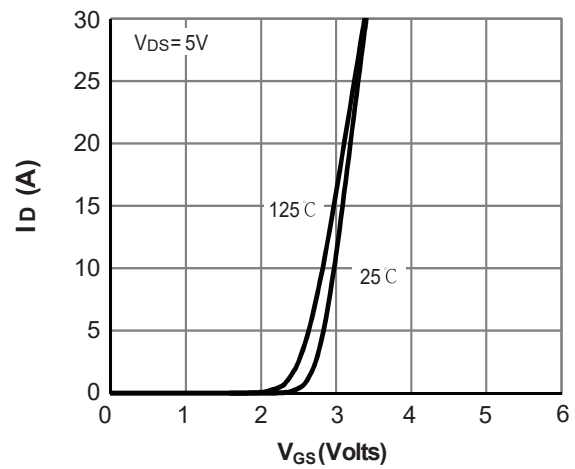
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t_{rr}	Body Diode Reverse Recovery Time	$I_F=12A$, $di/dt=100A/\mu s$	---	20	---	ns
Q_{rr}	Body Diode Reverse Recovery Charge		---	8	---	nC
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=2A$	---	---	1	V

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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.

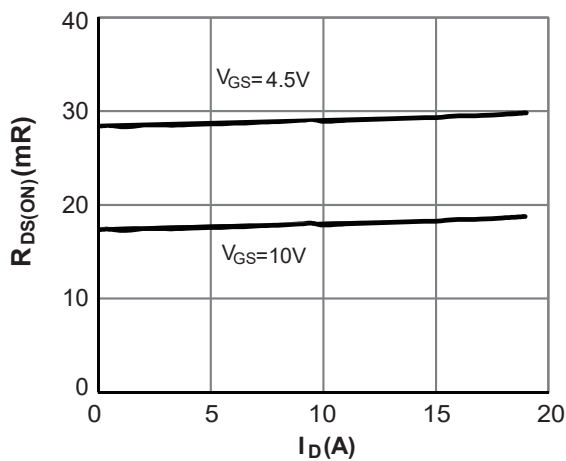
N- and P-Channel Enhancement Mode MOSFET



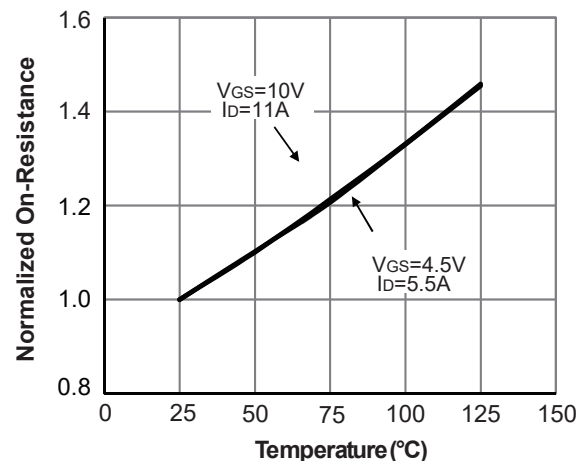
On-Region Characteristics



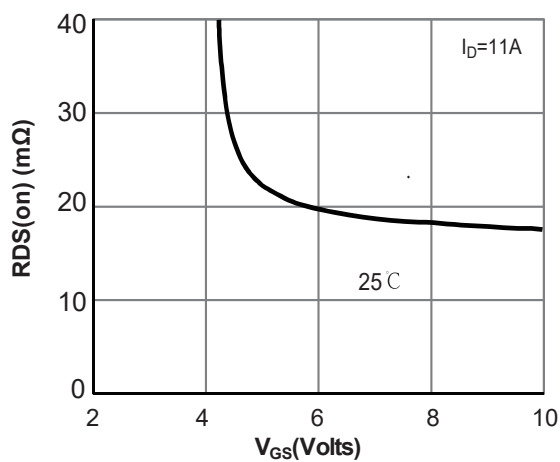
Transfer Characteristics



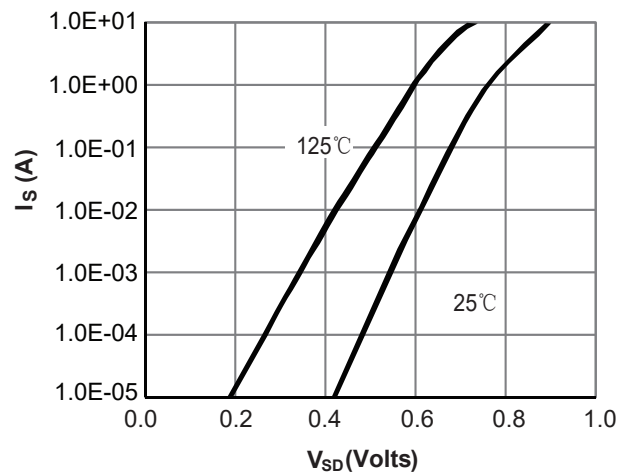
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Junction Temperature

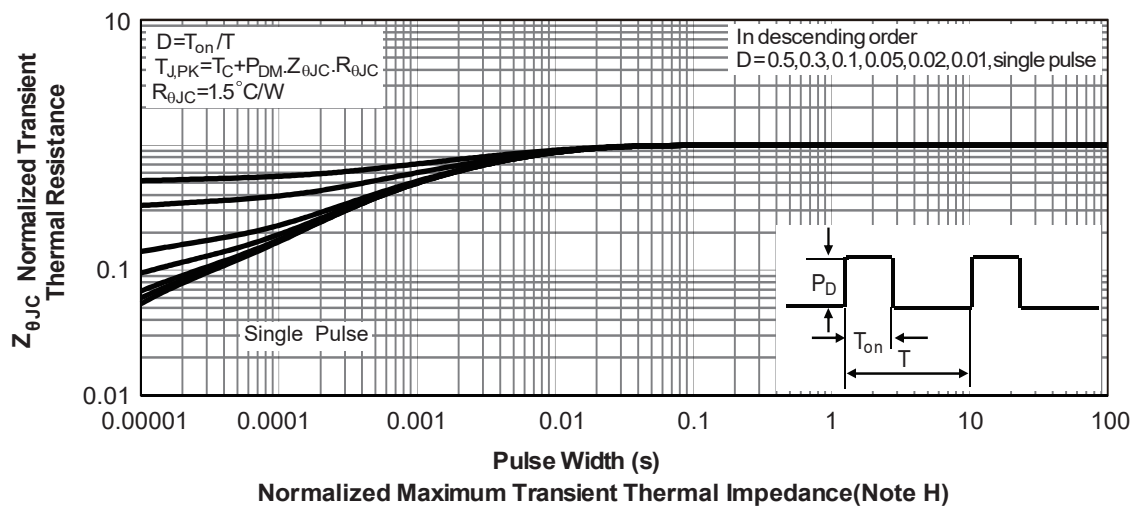
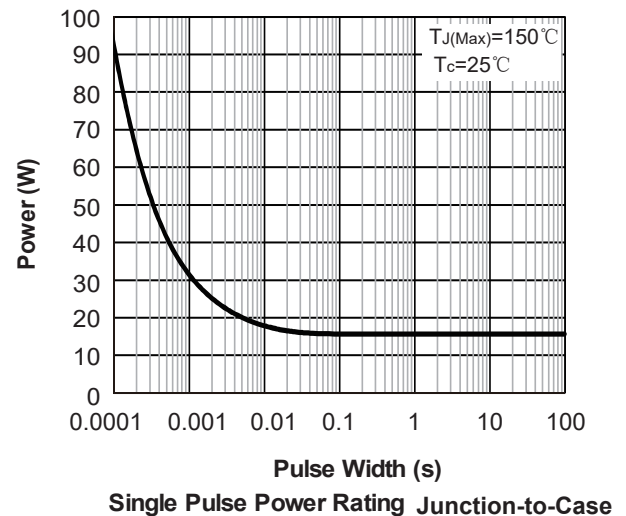
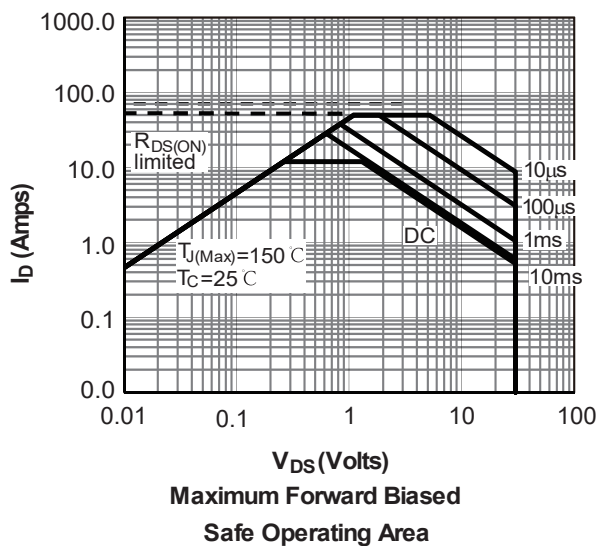
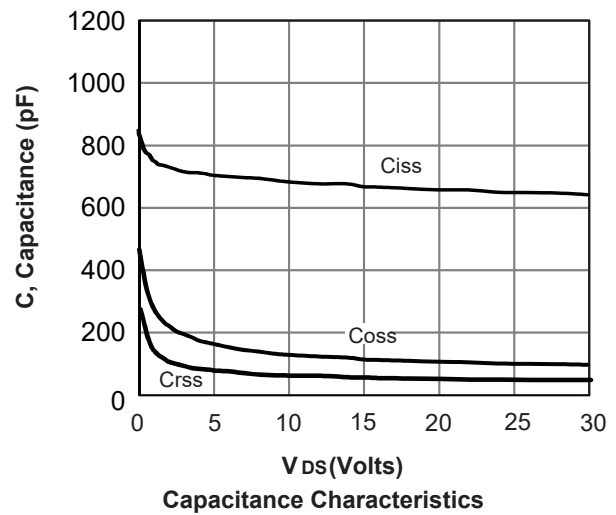
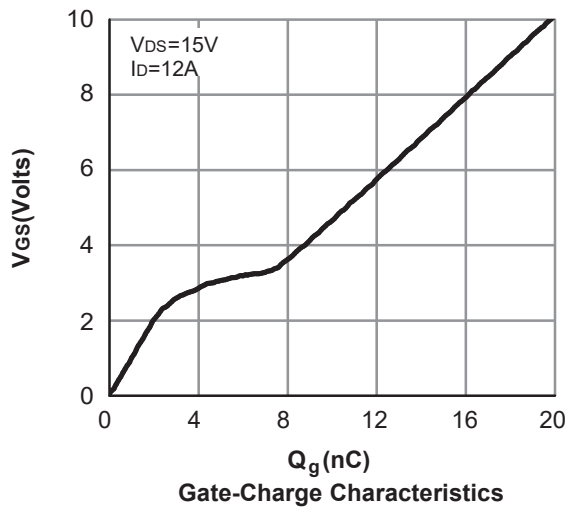


On-Resistance vs. Gate-Source Voltage

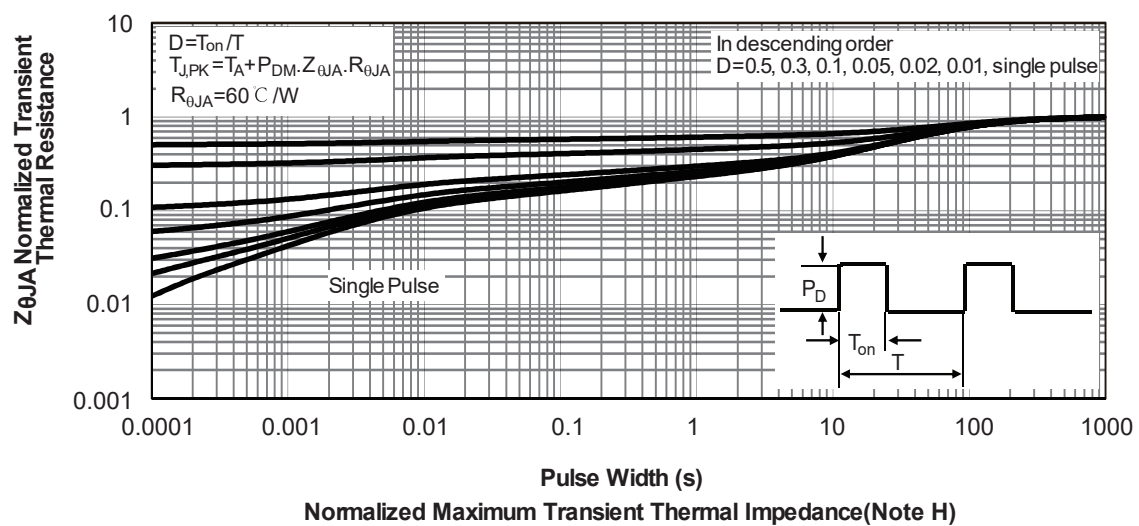
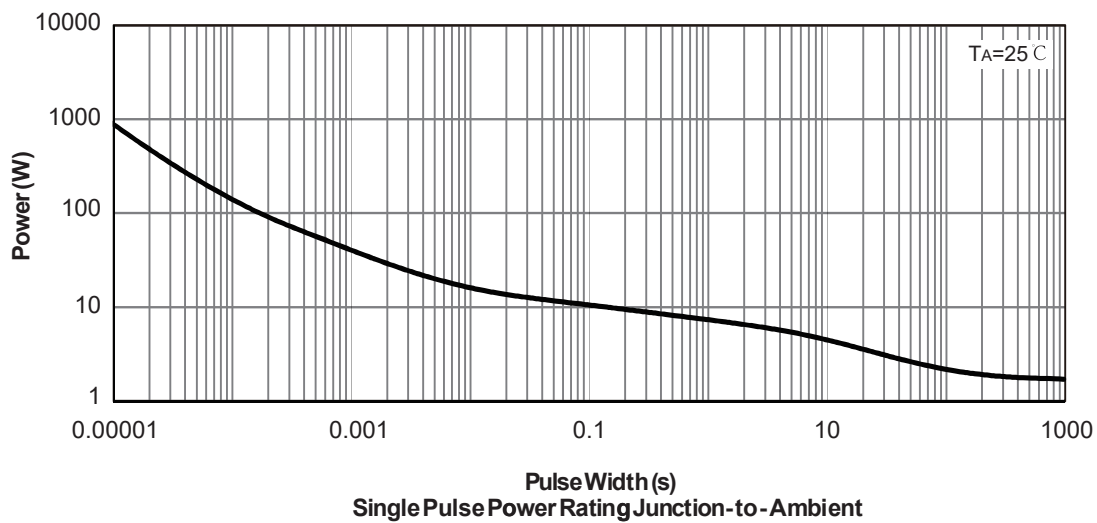
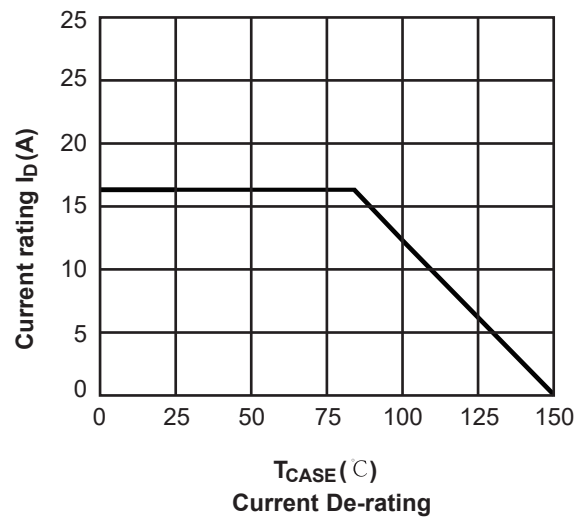
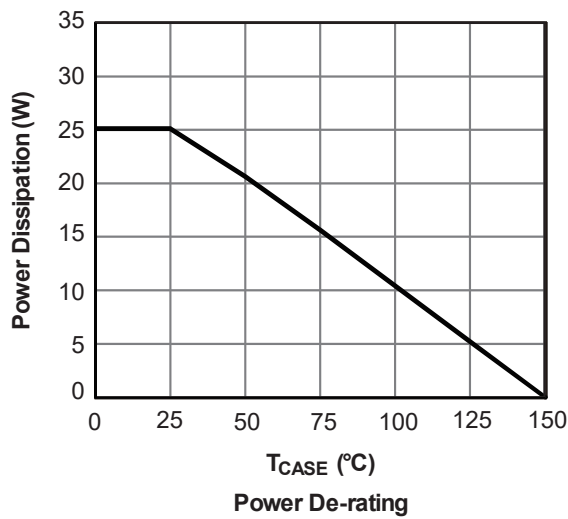


Body-Diode Characteristics

N- and P-Channel Enhancement Mode MOSFET



N- and P-Channel Enhancement Mode MOSFET



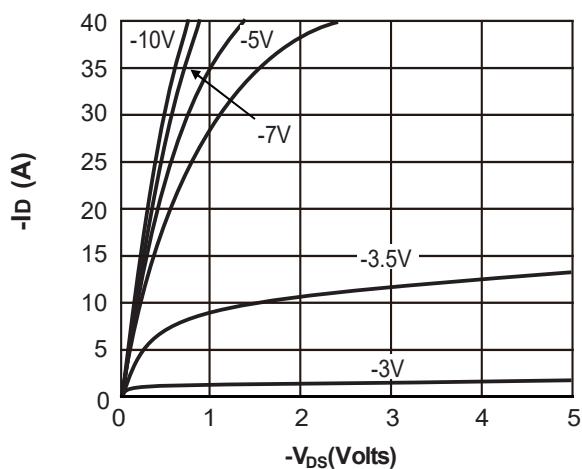
N- and P-Channel Enhancement Mode MOSFET

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

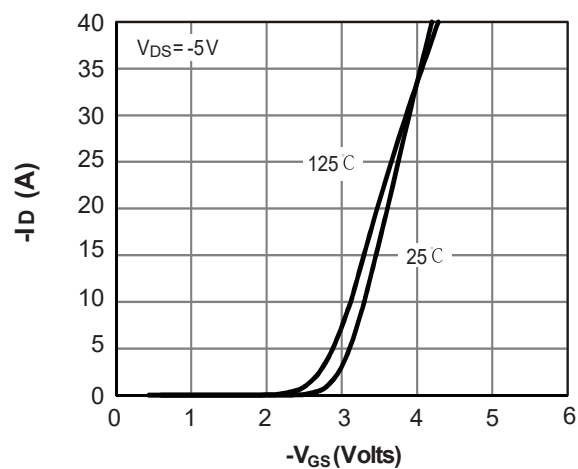
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-30	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-8A	---	---	20	mΩ
		V _{GS} =-4.5V, I _D =-5A	---	---	25	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-1	---	-3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-24V, 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} =-10V, I _D =-6A	---	14	---	S
Q _g	Total Gate Charge (10V)	V _{DS} =-15V, V _{GS} =-10V, I _D =-12A	---	19	---	nC
Q _{gs}	Gate-Source Charge		---	3	---	
Q _{gd}	Gate-Drain Charge		---	6	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =-15V, V _{GS} =-10V, R _L =1.25Ω R _{GEN} =3Ω	---	11	---	ns
T _r	Rise Time		---	20	---	
T _{d(off)}	Turn-Off Delay Time		---	25	---	
T _f	Fall Time		---	10	---	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	1600	---	pF
C _{oss}	Output Capacitance		---	240	---	
C _{rss}	Reverse Transfer Capacitance		---	200	---	

Diode Characteristics

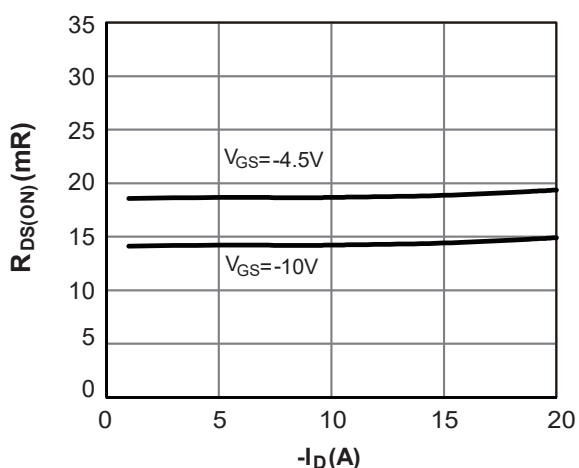
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t _{rr}	Body Diode Reverse Recovery Time	I _F =-12A, di/dt=100A/μs	---	21	---	ns
Q _{rr}	Body Diode Reverse Recovery Charge		---	13	---	nC
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A	---	---	-1	V



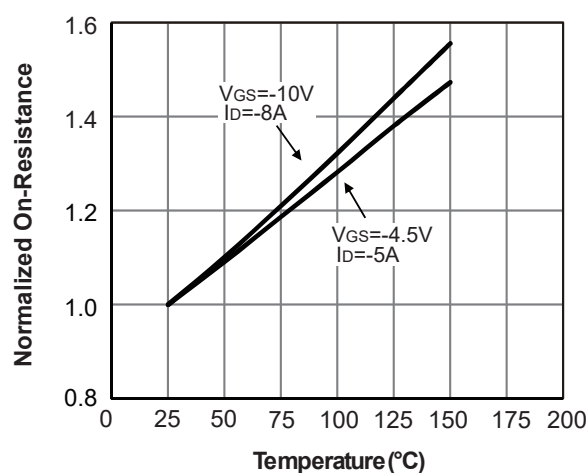
On-Region Characteristics



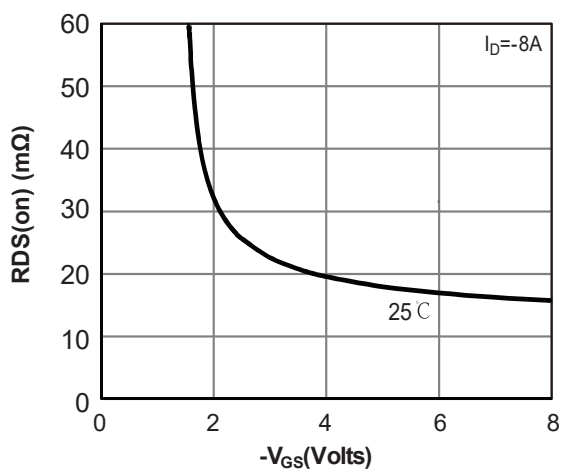
Transfer Characteristics



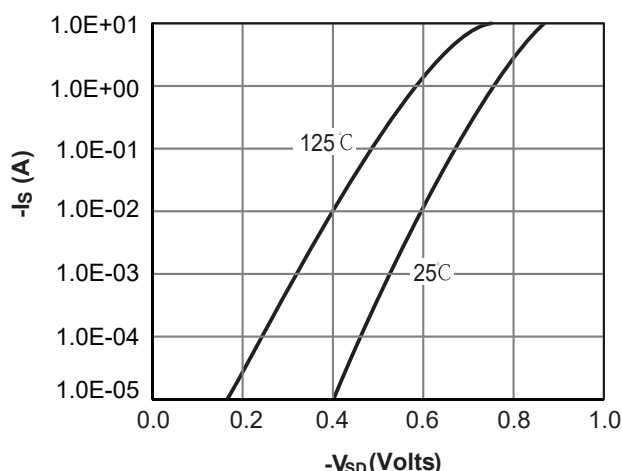
On-Resistance vs. Drain Current and Gate Voltage



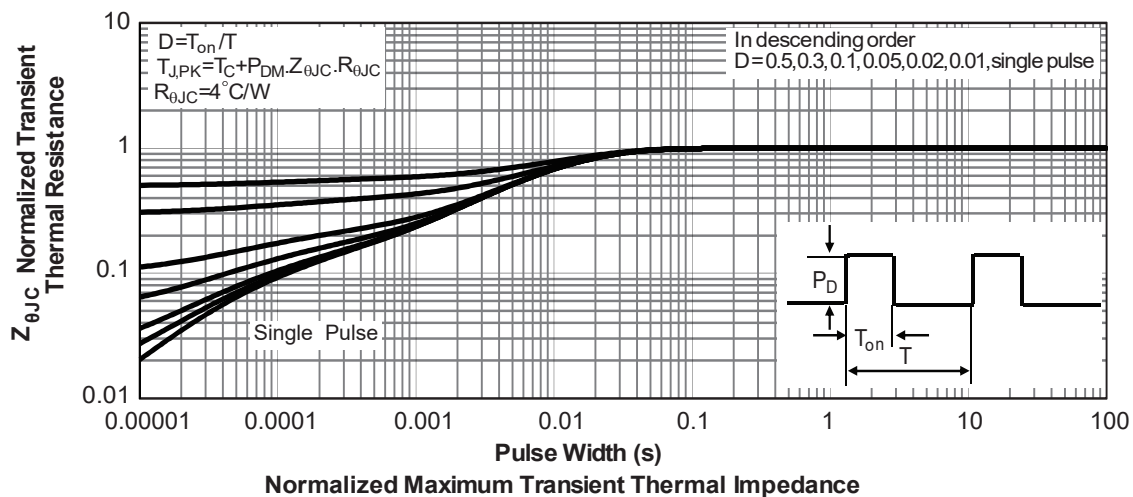
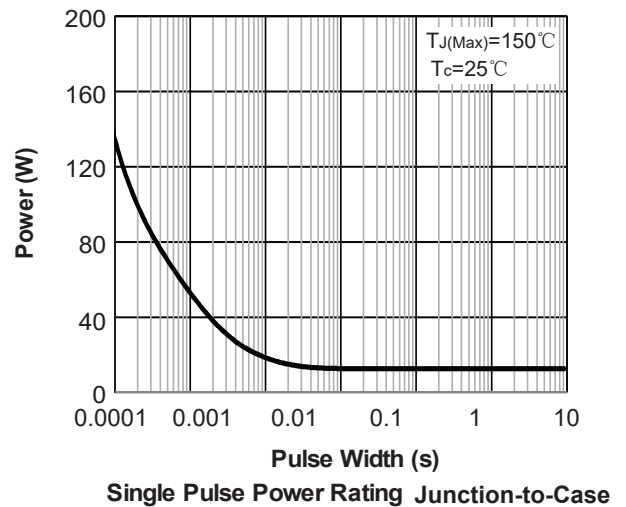
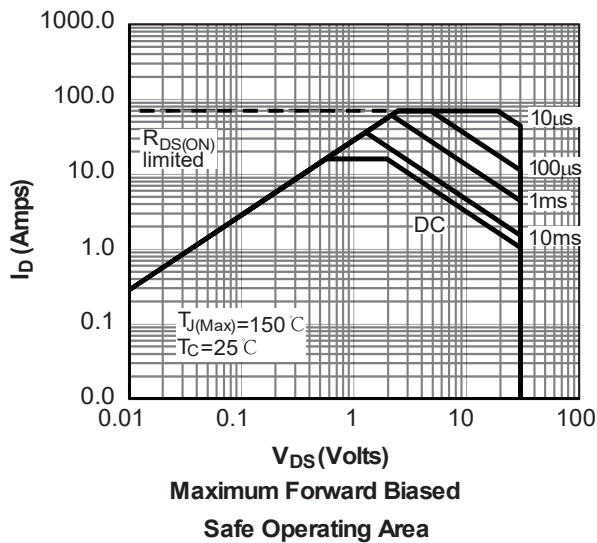
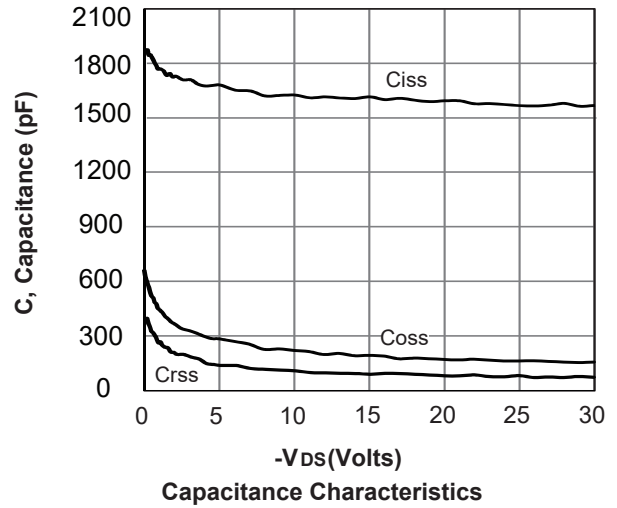
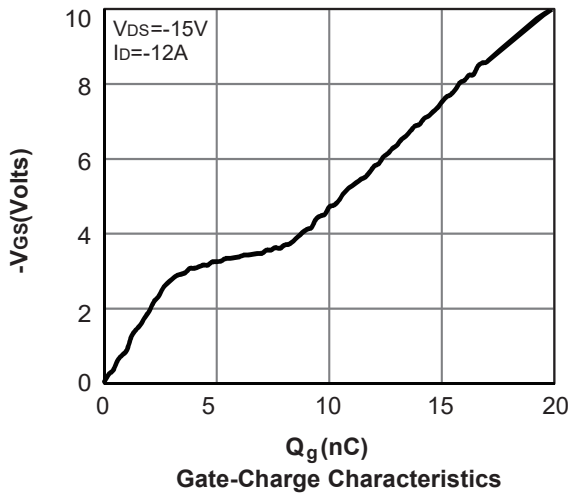
On-Resistance vs. Junction Temperature



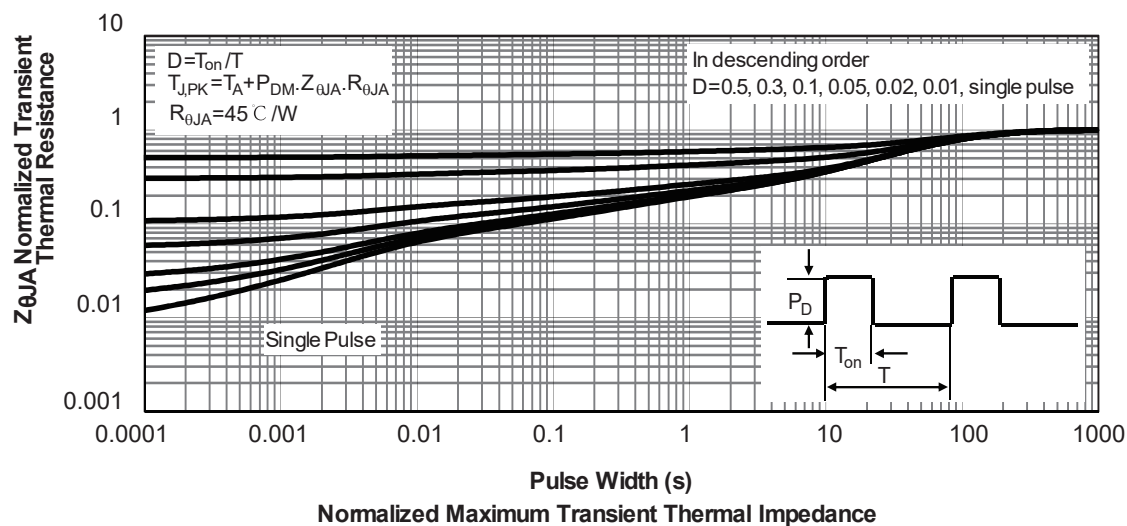
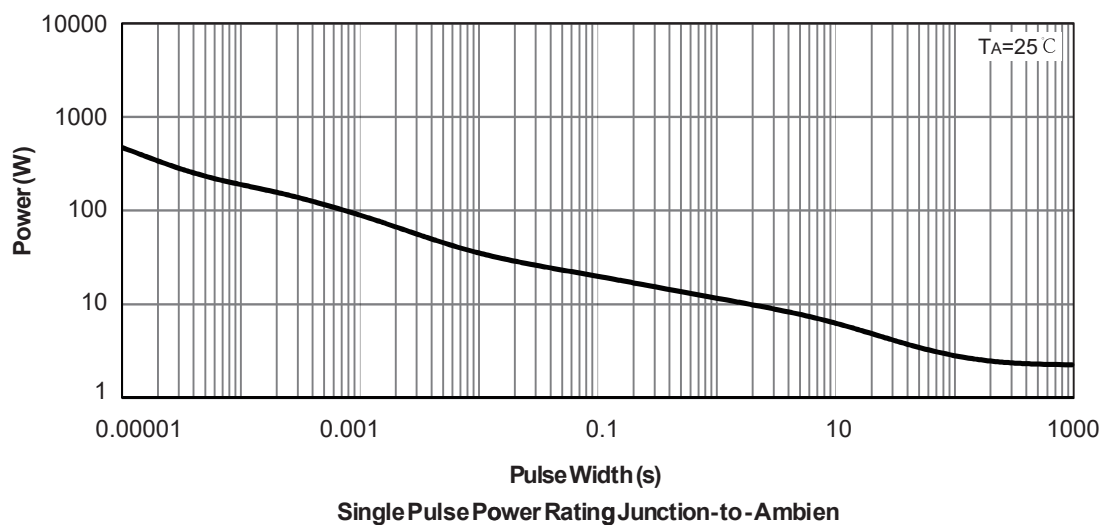
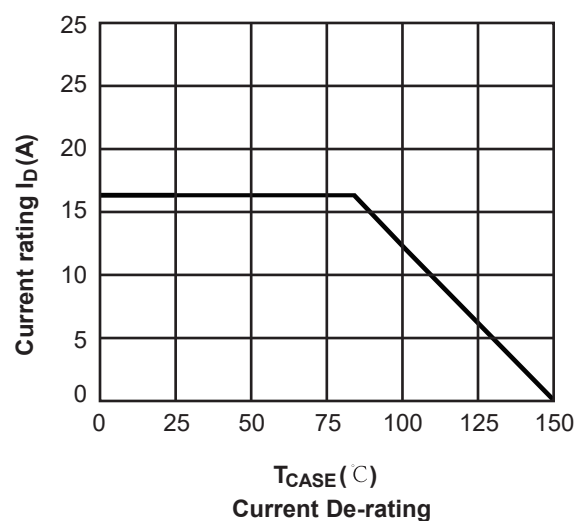
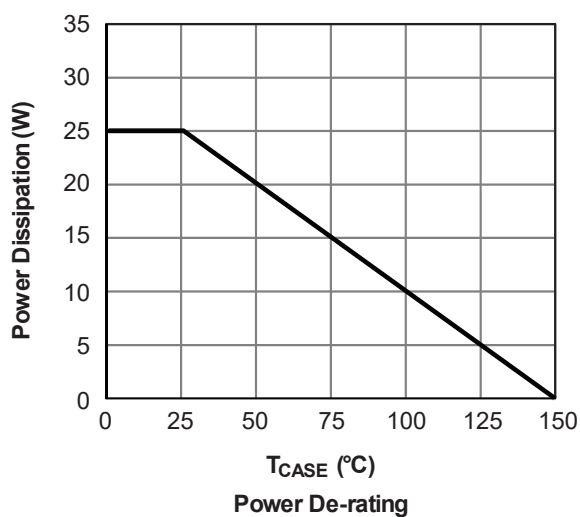
On-Resistance vs. Gate-Source Voltage



Body-Diode Characteristics



N- and P-Channel Enhancement Mode MOSFET



Package Dimensions

