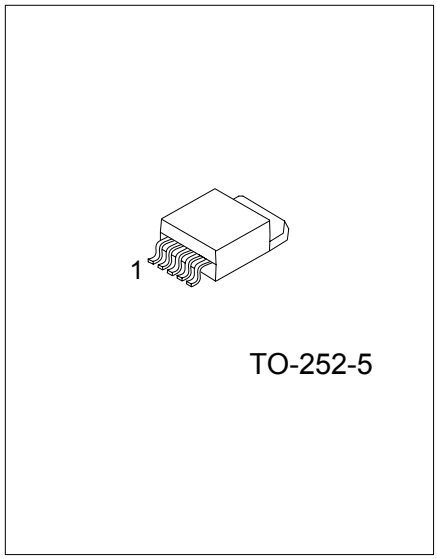
UD606

Power MOSFET

DUAL ENHANCEMENT MODE (N-CHANNEL/P-CHANNEL)



*Pb-free plating product number: UD606L

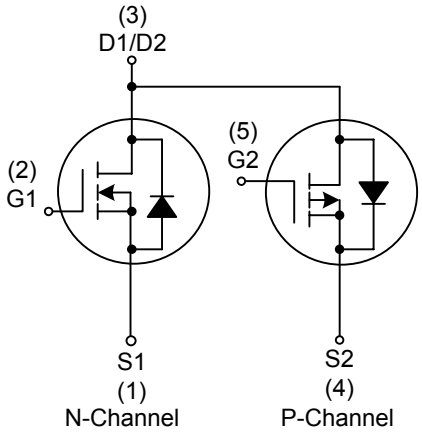
■ DESCRIPTION

The **UD606** can provide excellent $R_{DS(ON)}$ and low gate charge by using advanced trench technology MOSFETs. The **UD606** may be used in H-bridge, inverters and other applications.

■ FEATURES

* N-Channel: 40V/8A
  $R_{DS(ON)}$ = 33mΩ @ V_{GS} =10V
  $R_{DS(ON)}$ = 47mΩ @ V_{GS}= 4.5V
* P-Channel: -40V/-8A
  $R_{DS(ON)}$ = 50mΩ @ V_{GS}= -10V
  $R_{DS(ON)}$ = 70mΩ @ V_{GS}= -4.5V
* Super high dense cell design
* Reliable and rugged

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment					Packing
Normal	Lead Free Plating		1	2	3	4	5	
UD606-TN5-R	UD606L-TN5-R	TO-252-5	S1	G1	D1/D2	S2	G2	Tape Reel
UD606-TN5-T	UD606L-TN5-T	TO-252-5	S1	G1	D1/D2	S2	G2	Tube

UD606L-TN5-R (1)Packing Type (2)Package Type (3)Lead Plating	(1) R: Tape Reel, T: Tube (2) TN5: TO-252-5 (3) L: Lead Free Plating, Blank: Pb/Sn

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25℃, unless otherwise specified)

N-Channel:

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	40	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Note3)	T_C=25°C	I_D	8	A
Pulsed Drain Current (Note3)	T_C=25°C	I_{DM}	30	A
Power Dissipation		P_D	2	W
Junction Temperature		T_J	+175	°C
Storage Temperature		T_{STG}	-55 ~ +175	°C

P-Channel:

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-40	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Note3)	T_C=25°C	I_D	-8	A
Pulsed Drain Current (Note3)	T_C=25°C	I_{DM}	-30	A
Power Dissipation		P_D	2.5	W
Junction Temperature		T_J	+175	°C
Storage Temperature		T_{STG}	-55 ~ +175	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient	N-Channel	θ_{JA}		50	60	°C/W
	P-Channel			40	50	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A =25°C, unless otherwise specified)

N-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	40			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=32V, V_{GS}=0V			1	uA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	1	2.3	3	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	V_{GS}=10V, I_D=8A		27	33	mΩ
		V_{GS}=4.5V, I_D=6A		37	47	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{GS}=0V,V_{DS}=20V,f=1MHz		404		pF
Output Capacitance	C_{OSS}			95		pF
Reverse Transfer Capacitance	C_{RSS}			37		pF
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	V_{DS}=20V, V_{GS}=10V, R_G=3Ω, R_L=2.5Ω		3.5		ns
Turn-ON Rise Time	t_R			6		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			13.2		ns
Turn-OFF Fall Time	t_F			3.5		ns
Total Gate Charge (Note2)	Q_G	V_{DS}=20V, V_{GS}=10V, I_D=8A		9.2		nC
Gate-Source Charge	Q_{GS}			1.6		nC
Gate-Drain Charge	Q_{GD}			2.6		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	I_S=1A, V_{GS}=0V		0.76	1	V
Diode Continuous Forward Current	I_S				8	A
Reverse Recovery Time	t_{RR}	I_F=8A, dI/dt=100A/μs		22.9		ns
Reverse Recovery Charge	Q_{RR}			18.3		nC

■ ELECTRICAL CHARACTERISTICS(Cont.)

P-CHANNEL

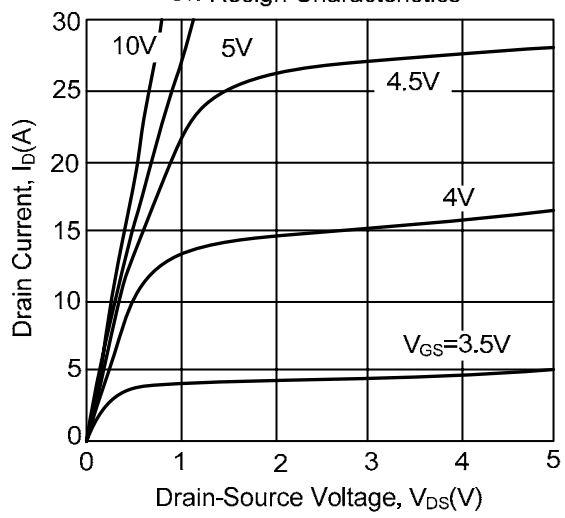
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-40			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-32V, V_{GS}=0V			-1	uA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250uA	-1	-1.8	-3	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-8A		35	50	mΩ
		V_{GS}=-4.5V, I_D=-4A		55	70	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{GS}=0V,V_{DS}=-20V,f=1.0MHz		657		pF
Output Capacitance	C_{OSS}			143		pF
Reverse Transfer Capacitance	C_{RSS}			63		pF
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	V_{DS}=-20V, V_{GS}=-10V, R_G=3Ω, R_L=2.5Ω		8		ns
Turn-ON Rise Time	t_R			12.2		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			24		ns
Turn-OFF Fall Time	t_F			12.5		ns
Total Gate Charge (Note2)	Q_G	V_{DS}=-20V, V_{GS}=-10V, I_D=-8A		14.1		nC
Gate-Source Charge	Q_{GS}			2.2		nC
Gate-Drain Charge	Q_{GD}			4.1		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	I_S=-1A, V_{GS}=0V		-0.75	-1	V
Diode Continuous Forward Current	I_S				-8	A
Reverse Recovery Time	t_{RR}	I_F=-8A, dI/dt=100A/μs		23.2		ns
Reverse Recovery Charge	Q_{RR}			18.2		nC

Notes: 1. Pulse width limited by $T_{J(MAX)}$
2. Pulse width ≤300us, duty cycle ≤0.5%.
3. Surface Mounted on 1in^2 pad area, t≤10sec.

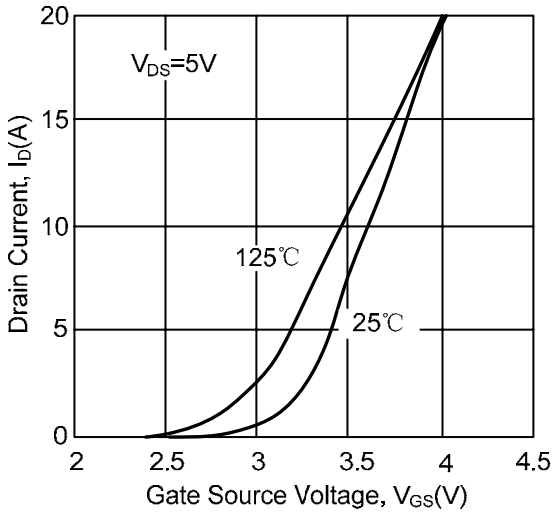
■ TYPICAL CHARACTERISTICS

N-CHANNEL

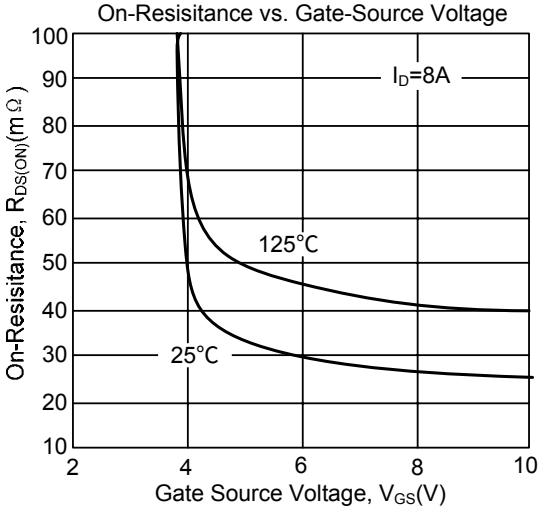
On-Resign Characteristics



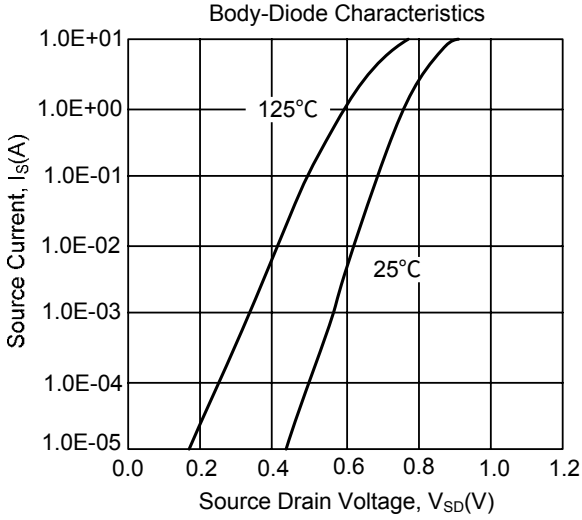
Transfer Characteristics



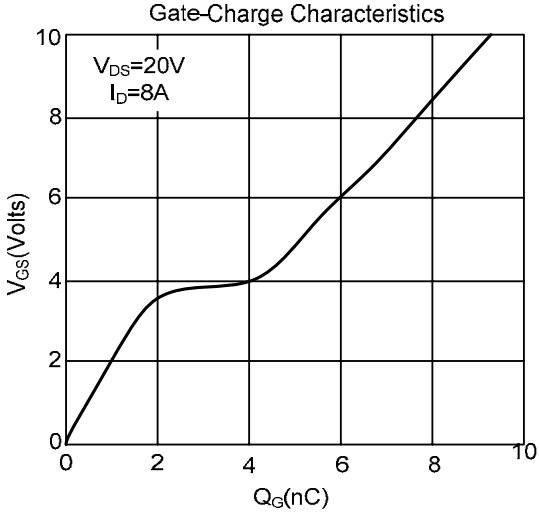
On-Resisitance vs. Gate-Source Voltage



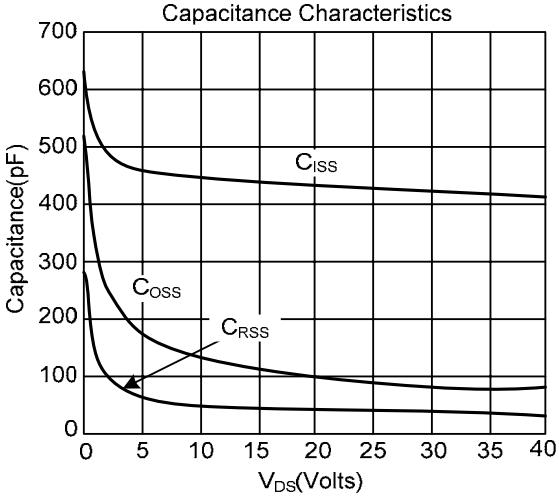
Body-Diode Characteristics



Gate-Charge Characteristics

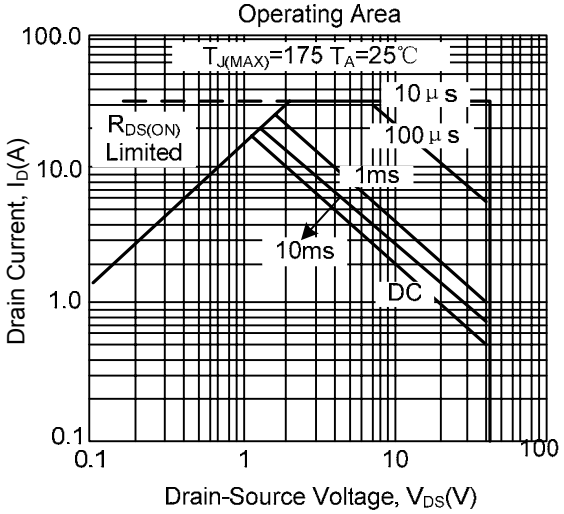


Capacitance Characteristics

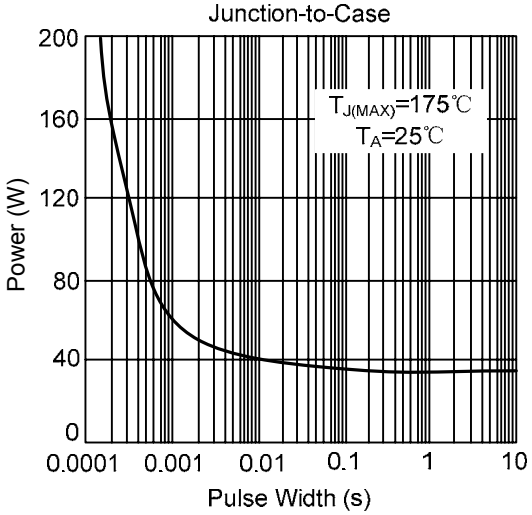


■ TYPICAL CHARACTERISTICS(Cont.)

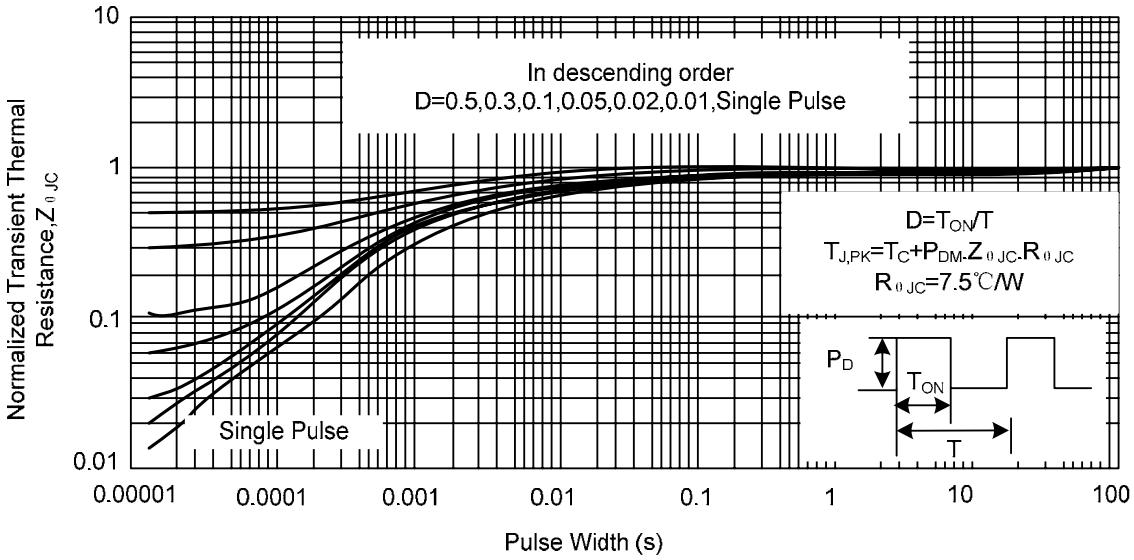
Maximum Forward Biased Safe Operating Area



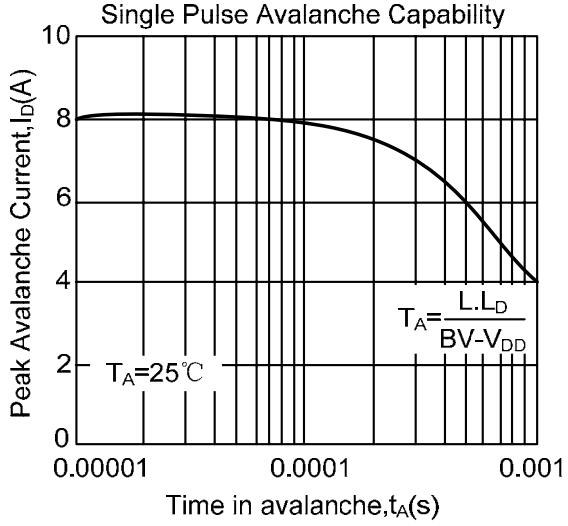
Single Pulse Power Rating Junction-to-Case



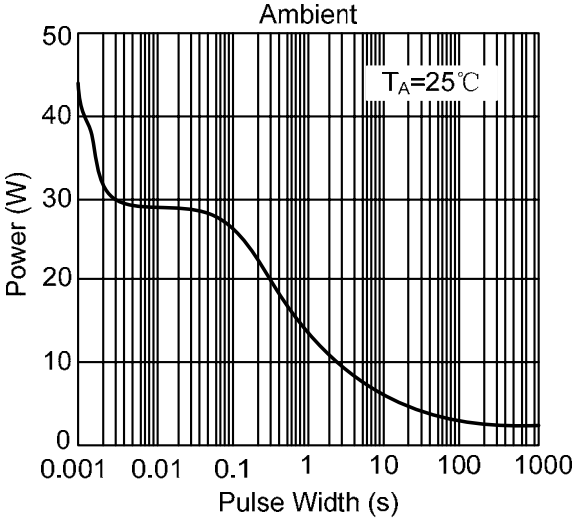
Normalized Maximum Transient Thermal Impedance (Note F)



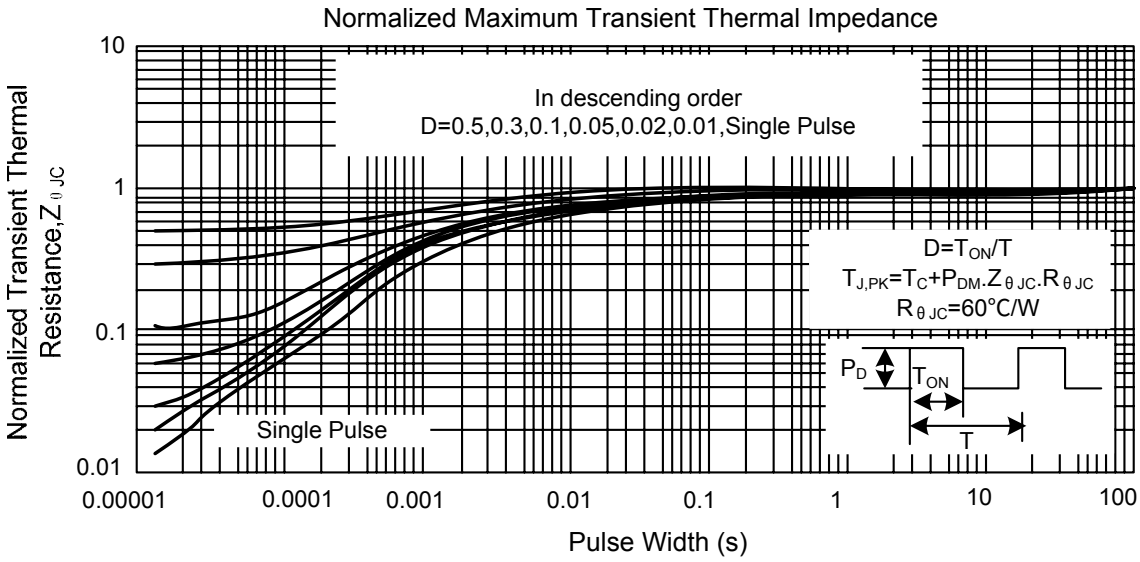
Single Pulse Avalanche Capability

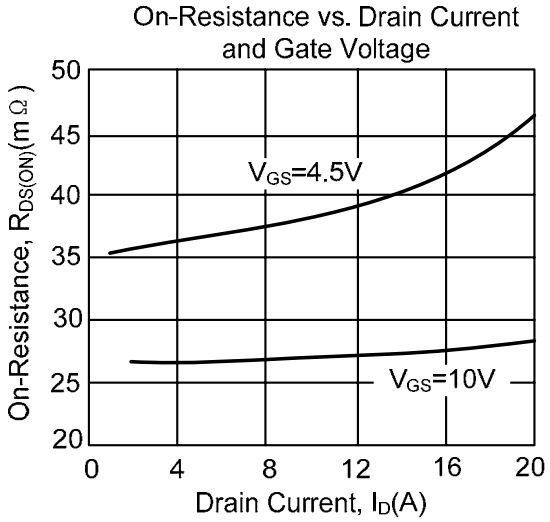


Single Pulse Power Rating Junction-to-Ambient

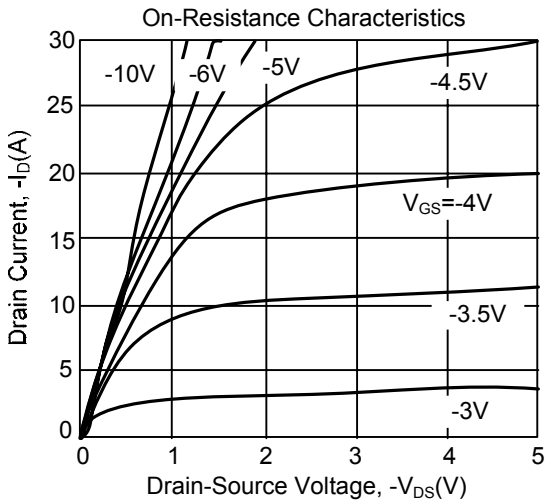


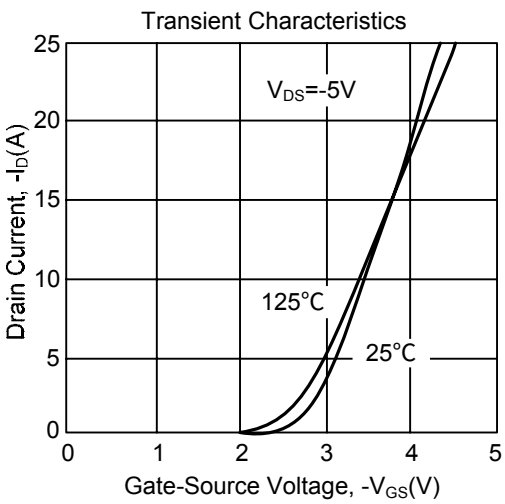
■ TYPICAL CHARACTERISTICS(Cont.)





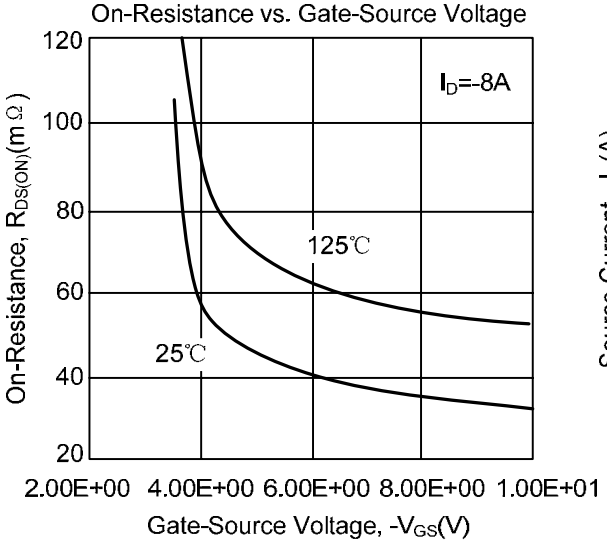
P-CHANNEL:



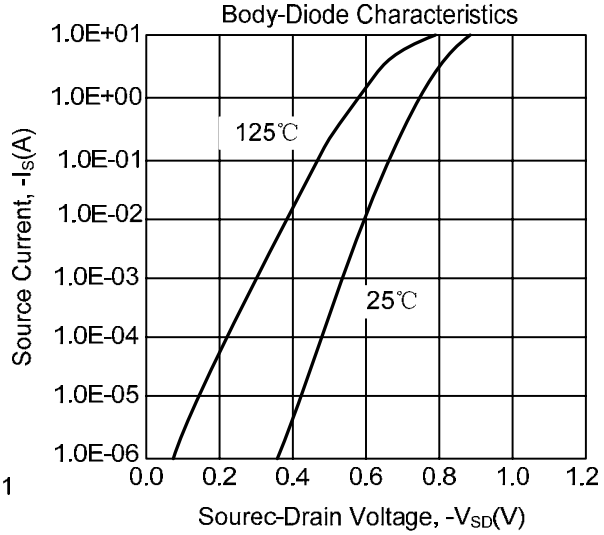


■ TYPICAL CHARACTERISTICS(Cont.)

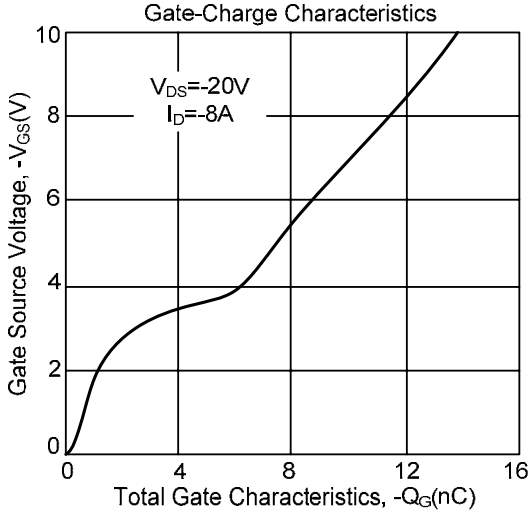
On-Resistance vs. Gate-Source Voltage



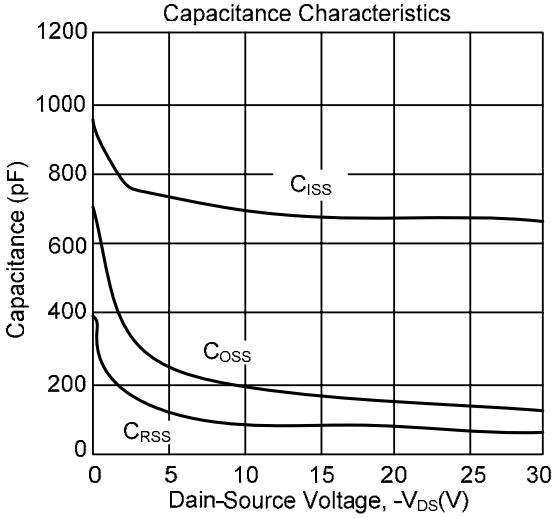
Body-Diode Characteristics



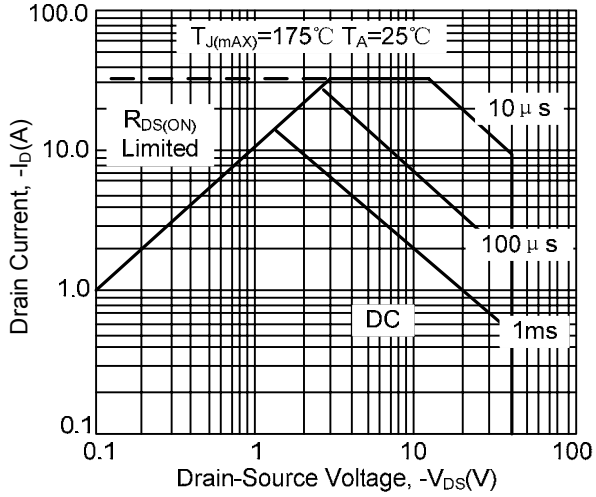
Gate-Charge Characteristics



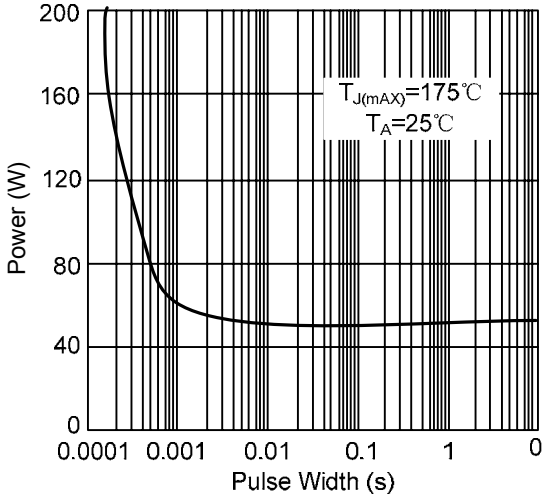
Capacitance Characteristics



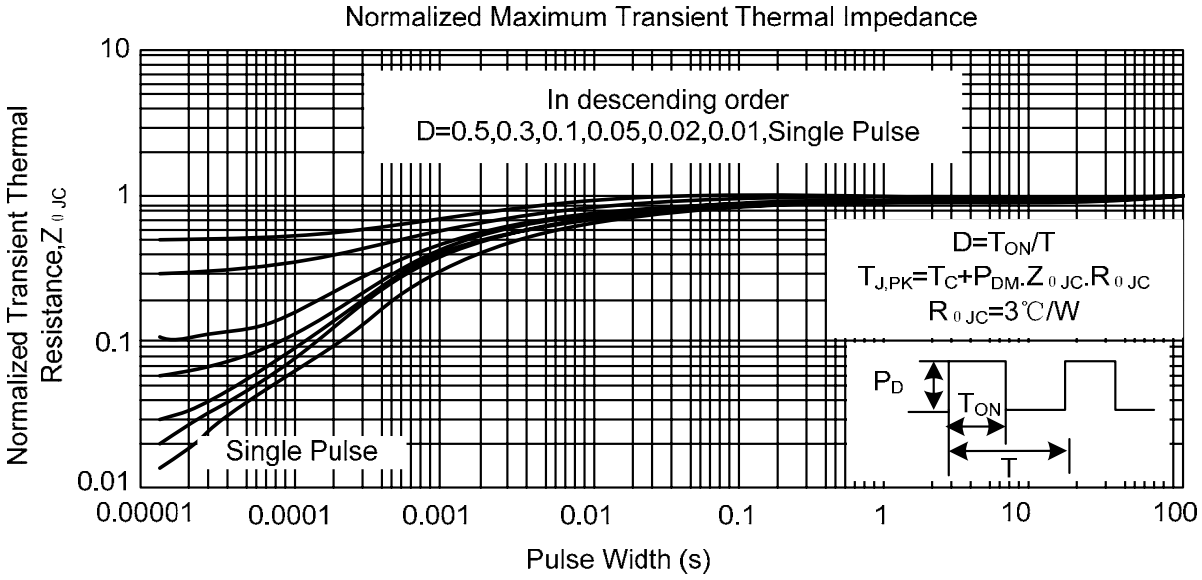
Maximum Forward Biased Safe Operating Area

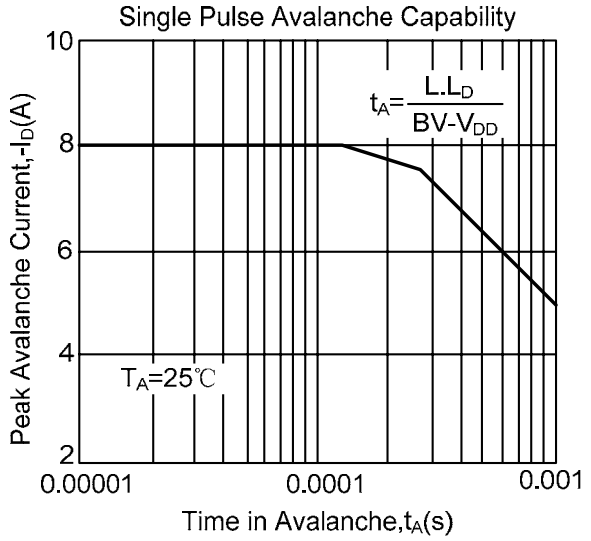


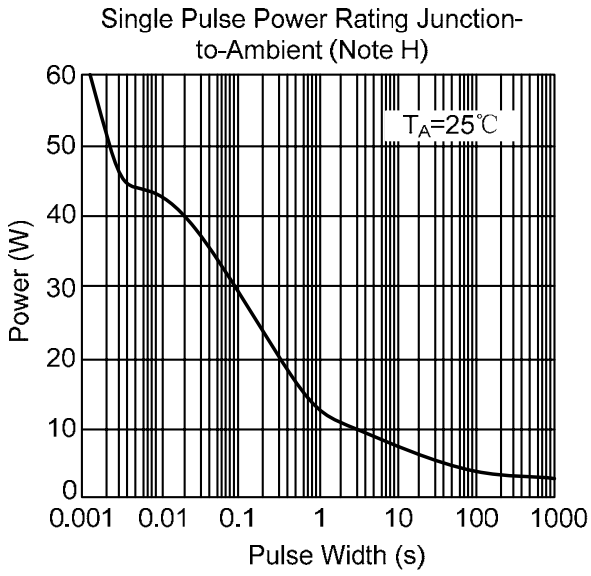
Single Pulse Power Rating Junction-to-Case

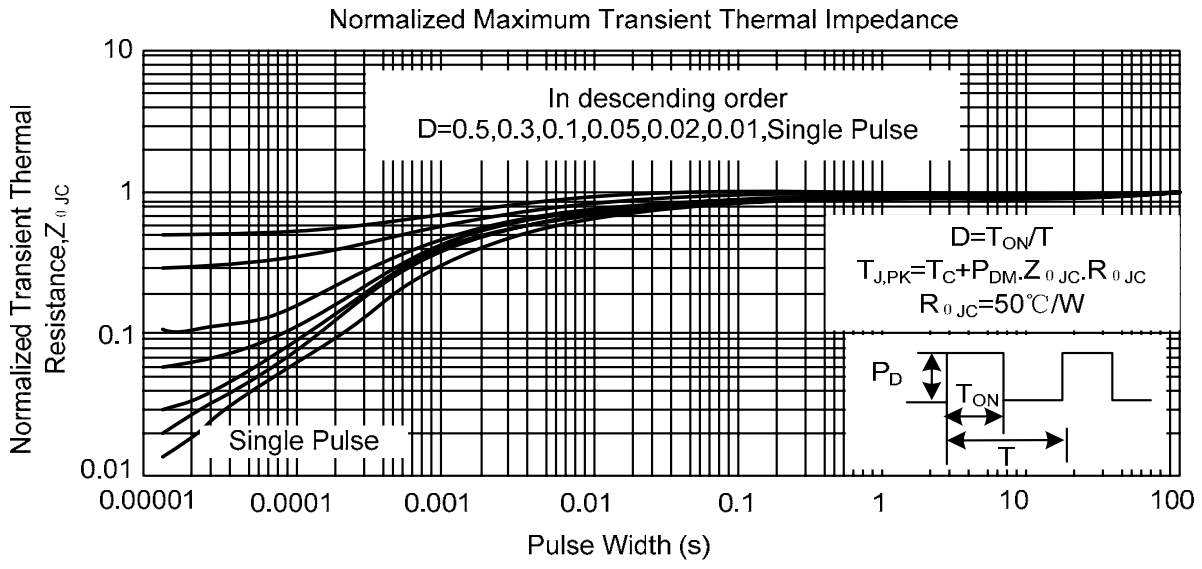


■ TYPICAL CHARACTERISTICS(Cont.)









■ TYPICAL CHARACTERISTICS(Cont.)