



UD4614

Power MOSFET

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

■ DESCRIPTION

The UTC **UD4614** can provide excellent $R_{DS(ON)}$ and low gate charge by using advanced trench technology MOSFETs. The UTC **UD4614** may be used in H-bridge, inverters and other applications.

■ FEATURES

* N-Channel: 40V/6A

$R_{DS(ON)} = 23.2m\Omega$ (typ.) @ $V_{GS} = 10V$

$R_{DS(ON)} = 32.6m\Omega$ (typ.) @ $V_{GS} = 4.5V$

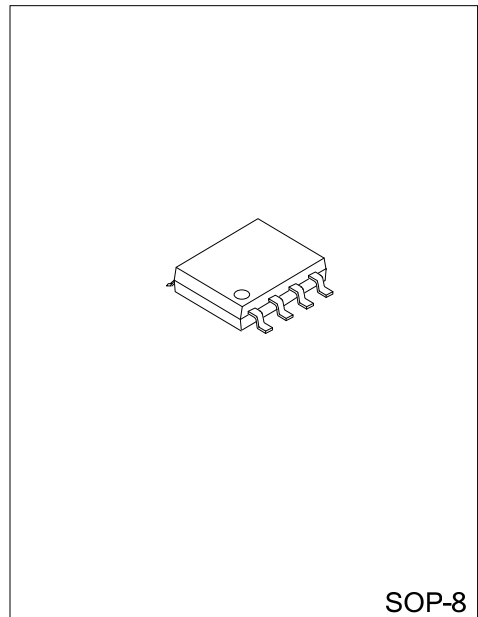
* P-Channel: -40V/-5A

$R_{DS(ON)} = 34.7m\Omega$ (typ.) @ $V_{GS} = -10V$

$R_{DS(ON)} = 50.6m\Omega$ (typ.) @ $V_{GS} = -4.5V$

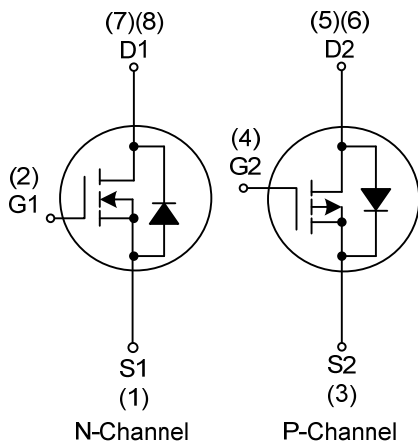
* Super high dense cell design

* Reliable and Rugged



SOP-8

■ SYMBOL

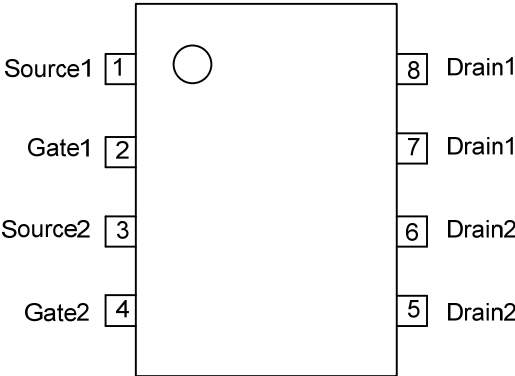


■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UD4614L-S08-R	UD4614G-S08-R	SOP-8	Tape Reel

<p>UD4614L-S08-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Plating</p>	<p>(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free, L: Lead Free</p>
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■ PIN CONFIGURATION



■ ABSOLUTE MAXIMUM RATINGS (Ta = 25°C, unless otherwise specified)

N-Channel:

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DS}	40	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current (Note3)	T _C =25°C	I _D	6	A
Pulsed Drain Current (Note3)	T _C =25°C	I _{DM}	20	A
Power Dissipation	T _C =25°C	P _D	2	W
	T _C =100°C		1.28	W
Junction Temperature		T _J	+150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°C

P-Channel:

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DS}	-40	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current (Note3)	T _C =25°C	I _D	-5	A
Pulsed Drain Current (Note3)	T _C =25°C	I _{DM}	-20	A
Power Dissipation	T _C =25°C	P _D	2	W
	T _C =100°C		1.28	W
Junction Temperature		T _J	+150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°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 (Note3)	θ _{JA}		74	110	°C/W

■ ELECTRICAL CHARACTERISTICS (Ta = 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 =10mA	40			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =32V, V _{GS} =0V			1	µA
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 =250µA	1	2.3	3	V
Drain-Source On-State Resistance (Note2)	R _{DS(ON)}	V _{GS} =10V, I _D =6A		23.2	31	mΩ
		V _{GS} =4.5V, I _D =5A		32.6	45	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =20V, f=1.0MHz		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 =3.3Ω		4.2		ns
Turn-ON Rise Time	t _R			3.3		ns
Turn-OFF Delay Time	t _{D(OFF)}			15.6		ns
Turn-OFF Fall Time	t _F			3		ns
Total Gate Charge (Note2)	Q _G	V _{DS} =20V, V _{GS} =10V, I _D =6A		8.3		nC
Gate-Source Charge	Q _{GS}			1.3		nC
Gate-Drain Charge	Q _{GD}			2.3		nC

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$I_S=1A, V_{GS}=0V$		0.77	1	V
Diode Continuous Forward Current	I_S				3	A
Reverse Recovery Time	t_{RR}	$I_{DS}=6A, dI/dt=100A/\mu s$		20.5		ns
Reverse Recovery Charge	Q_{RR}			14.5		nC

P-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-10mA$	-40			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-32V, V_{GS}=0V$			-1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA

ON CHARACTERISTICS

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.9	-3	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-5A$		34.7	45	m Ω
		$V_{GS}=-4.5V, I_D=-2A$		50.6	63	m Ω

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)	$t_{D(ON)}$	$V_{DS}=-20V, V_{GS}=-10V,$ $R_G=3\Omega, R_L=4\Omega$		7.5		ns
Turn-ON Rise Time	t_R			6.7		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			26		ns
Turn-OFF Fall Time	t_F			11.2		ns
Total Gate Charge (Note2)	Q_G	$V_{DS}=-20V, V_{GS}=-10V, I_D=-5A$		13.6		nC
Gate-Source Charge	Q_{GS}			1.8		nC
Gate-Drain Charge	Q_{GD}			3.9		nC

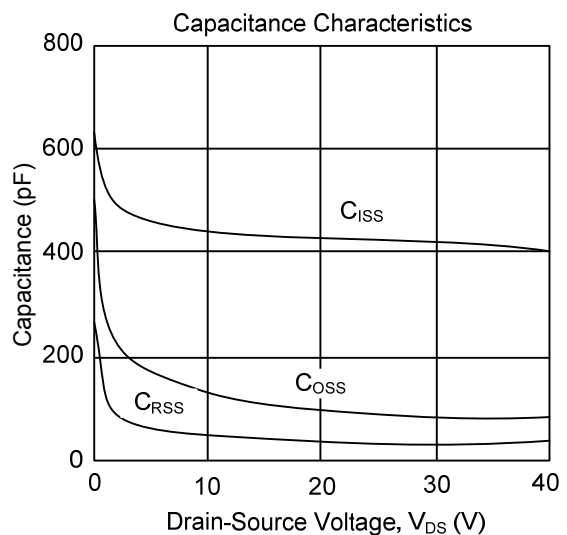
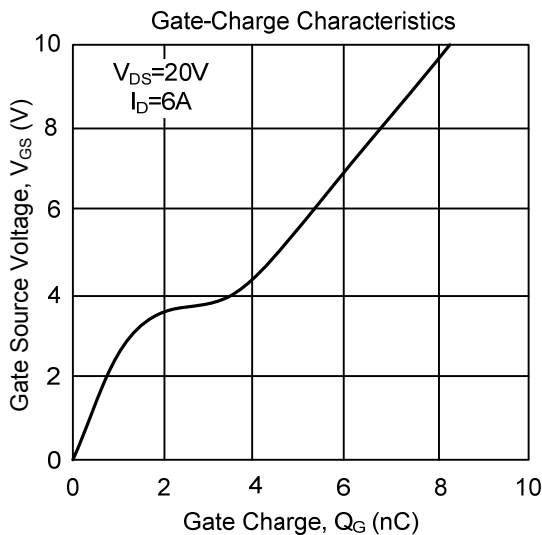
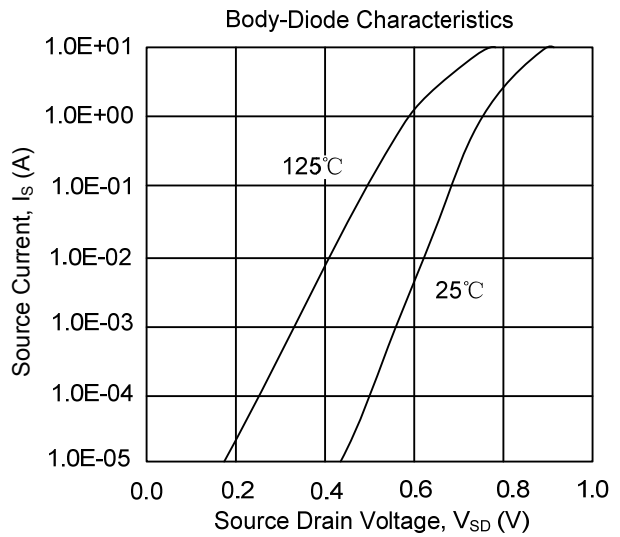
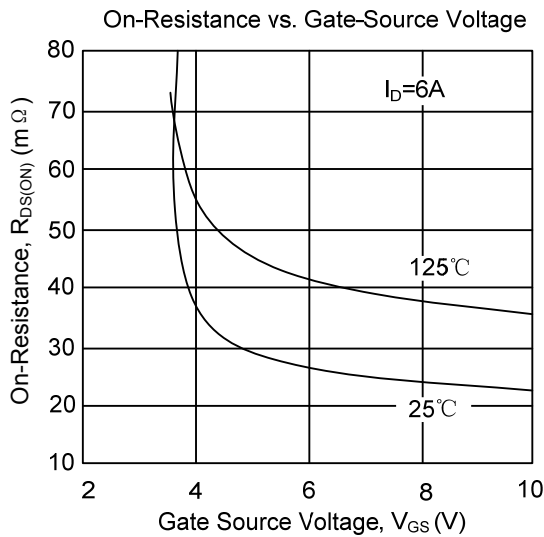
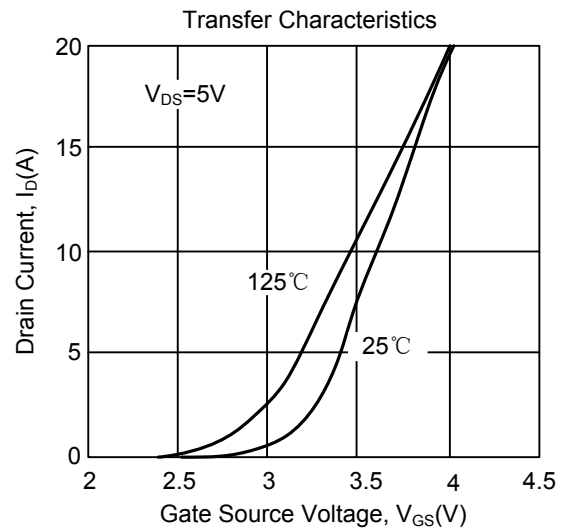
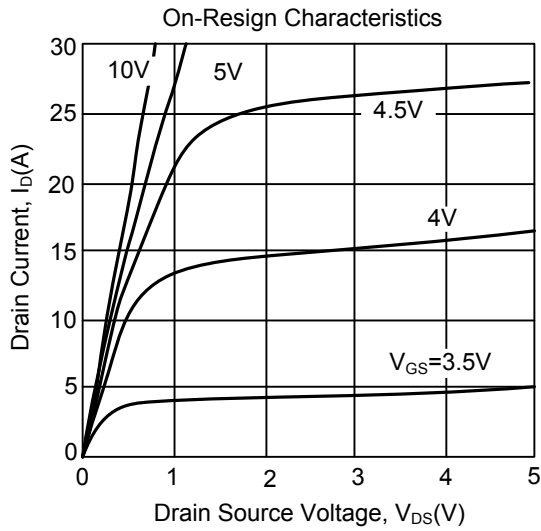
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS

Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$I_S=-1A, V_{GS}=0V$		-0.75	-1	V
Diode Continuous Forward Current	I_S				-3.2	A
Reverse Recovery Time	t_{RR}	$I_{DS}=-5A, dI/dt=100A/\mu s$		22.3		ns
Reverse Recovery Charge	Q_{RR}			15.2		nC

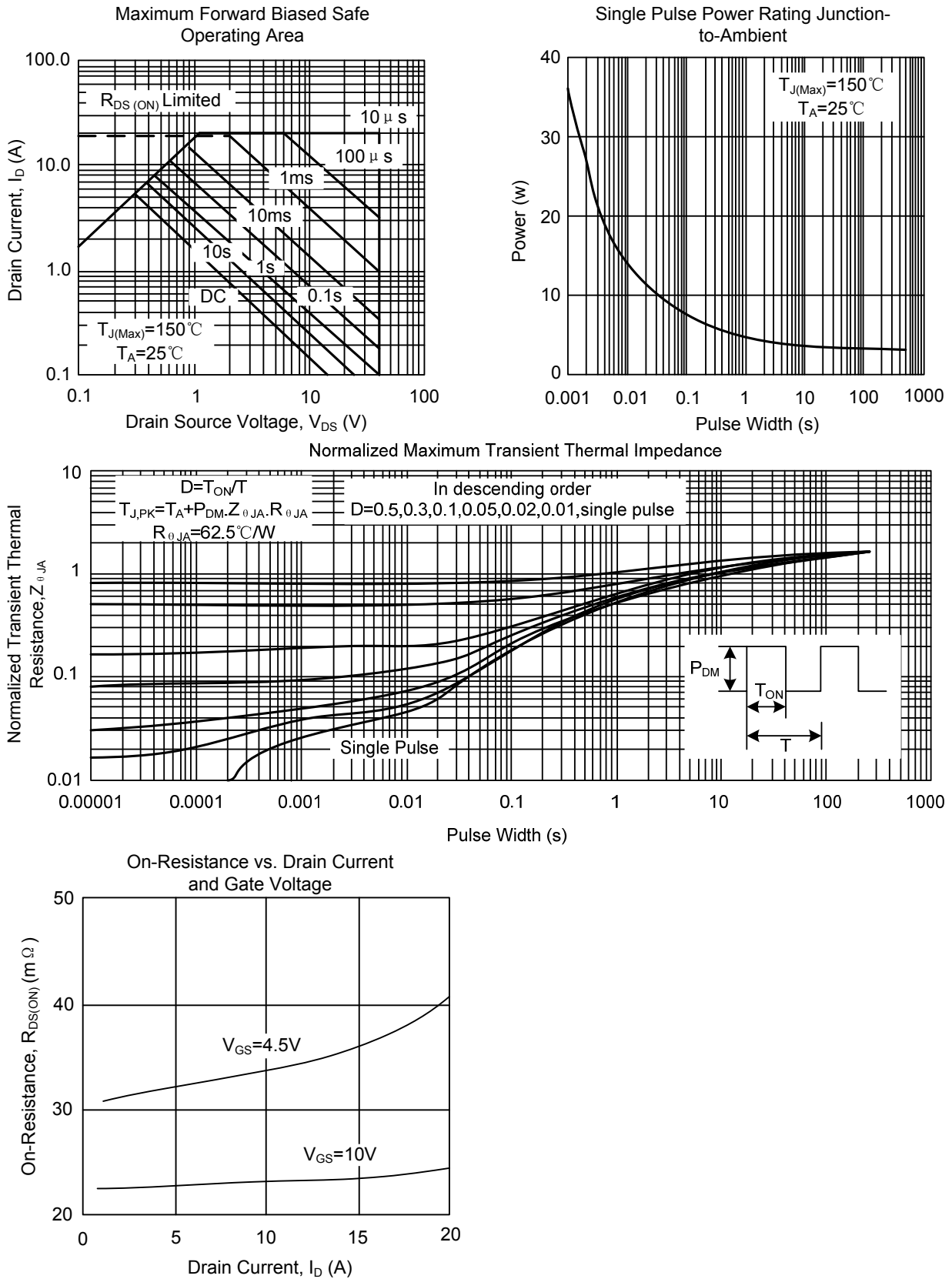
- Notes: 1. Pulse width limited by $T_{J(MAX)}$
 2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 3. Surface Mounted on $1in^2$ pad area, $t \leq 10sec$.

TYPICAL CHARACTERISTICS

N-CHANNEL

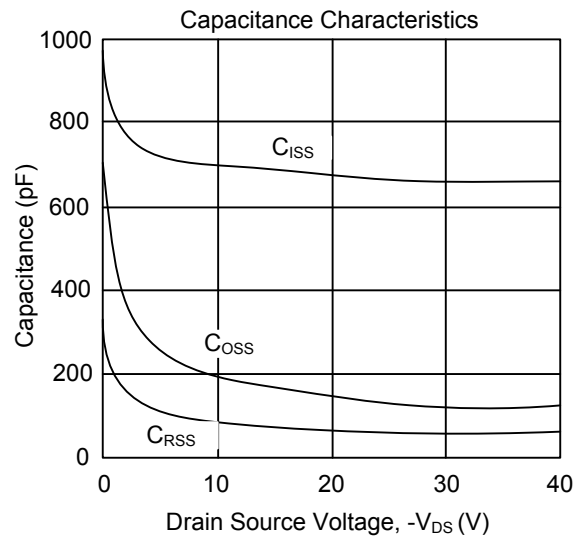
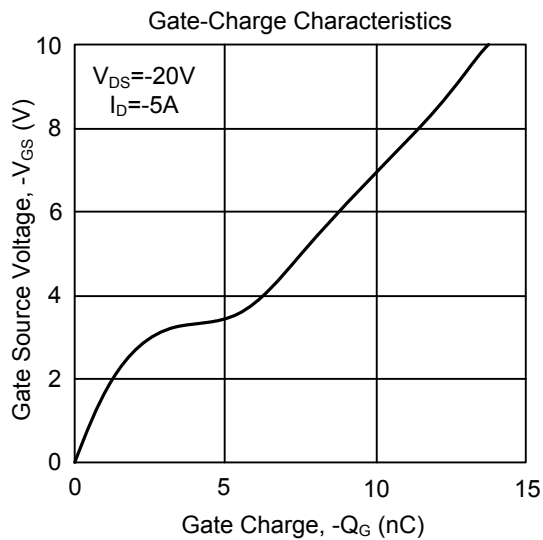
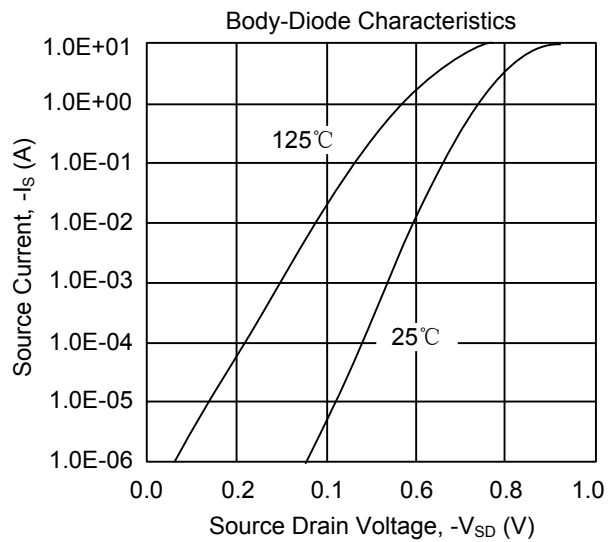
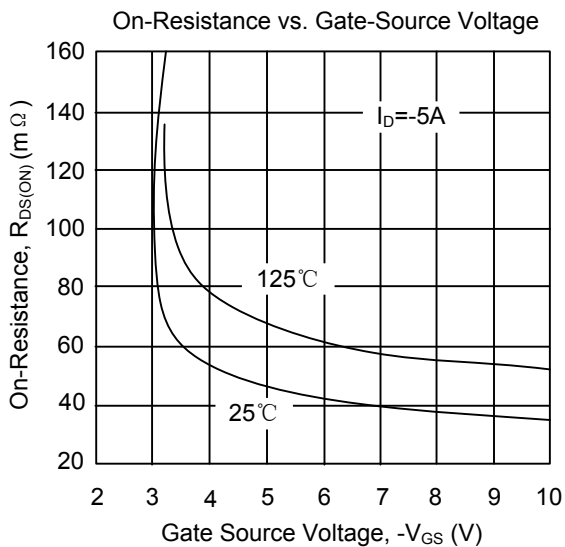
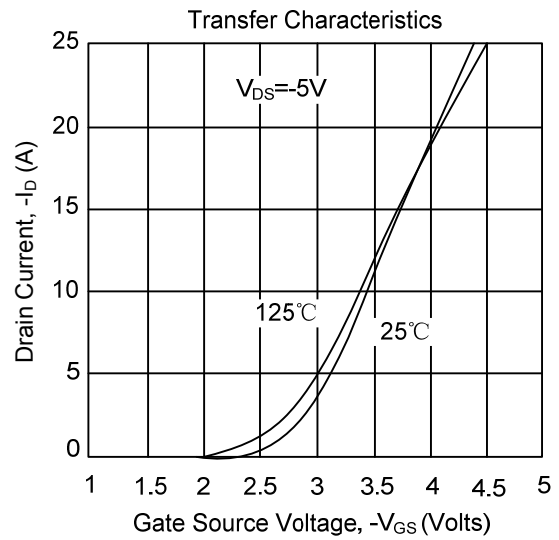
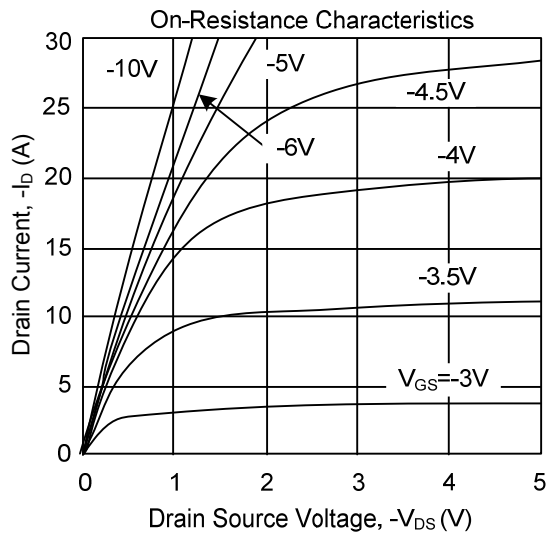


■ TYPICAL CHARACTERISTICS(Cont.)

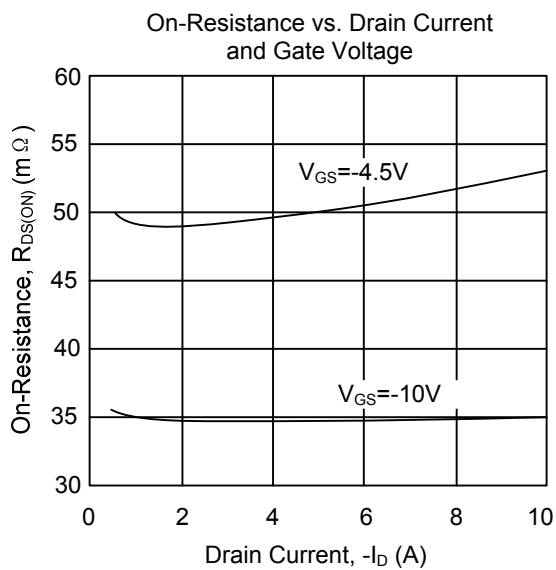
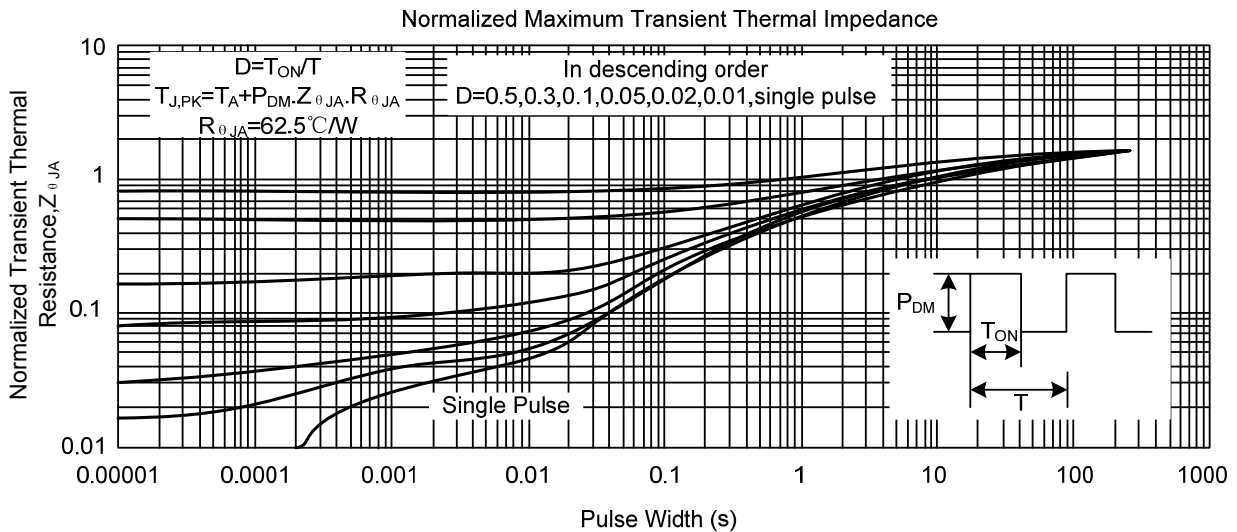
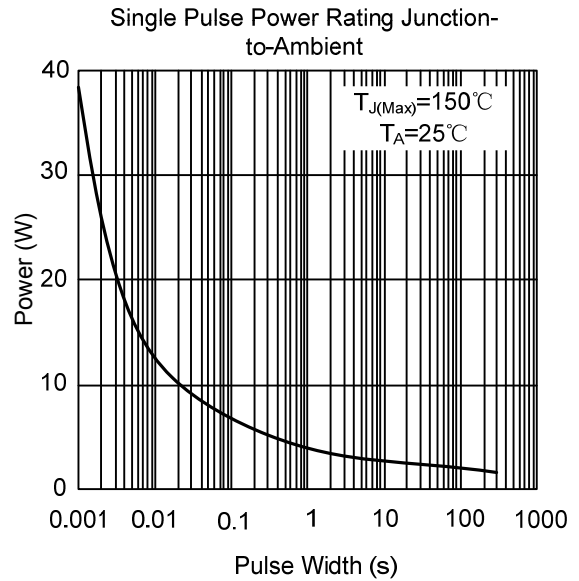
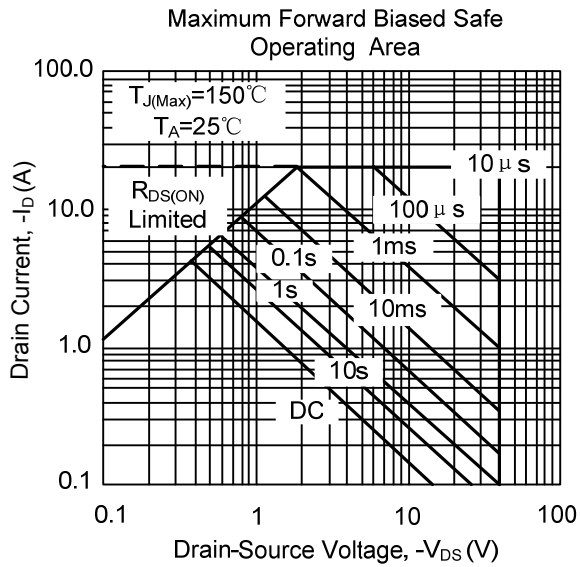


■ TYPICAL CHARACTERISTICS(Cont.)

P-CHANNEL



■ TYPICAL CHARACTERISTICS(Cont.)



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