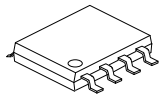
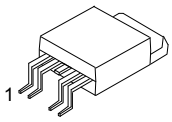
UTM4052

Power MOSFET

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



SOP-8

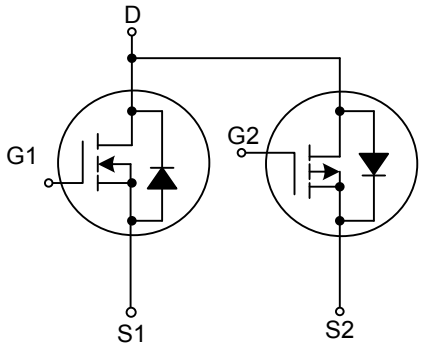


TO-252-4

■ FEATURES

* N-Channel: 40V/7.5A
  $R_{DS(ON)}$ = 30 mΩ (typ.) @V_{GS} =10V
  $R_{DS(ON)}$ = 46 mΩ(typ.) @ V_{GS}= 5V
* P-Channel: -40V/-6A
  $R_{DS(ON)}$ = 45 mΩ(typ.) @ V_{GS}= -10V
  $R_{DS(ON)}$ = 52 mΩ(typ.) @ V_{GS}= -5V
* Super High Dense Cell Design
* Reliable and Rugged

■ SYMBOL



N-Channel P-Channel

■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1.	2.	3.	4.	5.	6.	7.	8.	
UTM4052L-S08-R	UTM4052G-S08-R	SOP-8	S1	G1	S2	G2	D	D	D	D	Tape Reel
UTM4052L-TN4-R	UTM4052G-TN4-R	TO-252-4	S1	G1	D	S2	G2	-	-	-	Tape Reel
UTM4052L-TN4-T	UTM4052G-TN4-T	TO-252-4	S1	G1	D	S2	G2	-	-	-	Tube

UTM4052L-S08-R

(1)Packing Type

(2)Package Type

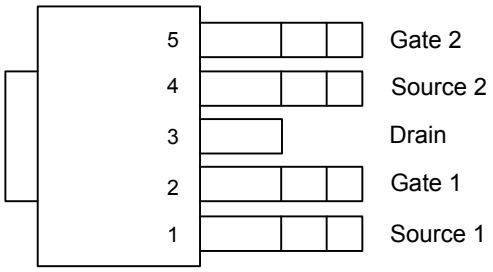
(3)Lead Plating

(1) R: Tape Reel, T: Tube

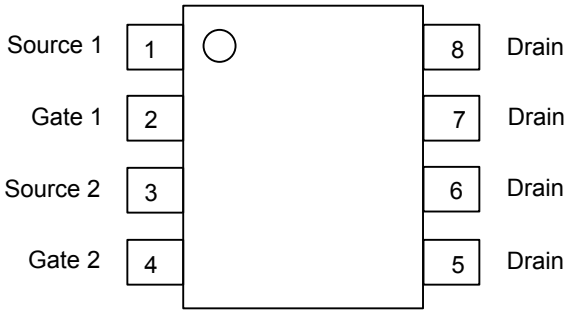
(2) S08: SOP-8, TN4: TO-252-4

(3) G: Halogen Free, L: Lead Free

■ PIN CONFIGURATION



TO-252-4



SOP-8

■ 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 (Note 2)	T_C=25°C	I_D	7.5	A
Pulsed Drain Current (Note 2)	T_C=25°C	I_{DM}	30	A
Power Dissipation (T_C=25°C)	SOP-8	P_D	3.1	W
	TO-252-4		25	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 (Note 2)	T_C=25°C	I_D	-6	A
Pulsed Drain Current (Note 2)	T_C=25°C	I_{DM}	-25	A
Power Dissipation (T_C=25°C)	SOP-8	P_D	3.1	W
	TO-252-4		25	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Notes: 1. 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.
2. Surface Mounted on 1in^2 pad area, t≤10sec.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note)	SOP-8	θ_{JA}	78	°C/W
	TO-252-4		50	°C/W
Junction to Case	SOP-8	θ_{JC}	40	°C/W
	TO-252-4		5	°C/W

Note: Surface Mounted on 1in^2 pad area, t≤10sec.

■ 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	1.3	2	2.5	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	V_{GS}=10V, I_D=7.5A		30	38	mΩ
		V_{GS}=5V, I_D=5A		46	62	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{GS}=0V,V_{DS}=20V,f=1.0MHz		480		pF
Output Capacitance	C_{OSS}			70		pF
Reverse Transfer Capacitance	C_{RSS}			50		pF
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	V_{DS}=20V, V_{GS}=10V, I_D=1A, R_G=6Ω, R_L=20Ω		7	14	ns
Turn-ON Rise Time	t_R			10	19	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			17	32	ns
Turn-OFF Fall Time	t_F			3	6	ns
Total Gate Charge (Note2)	Q_G	V_{DS}=20V, V_{GS}=10V, I_D=7.5A		17	24	nC
Gate-Source Charge	Q_{GS}			2.2		nC
Gate-Drain Charge	Q_{GD}			4		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	T_J=25℃, I_S=2A, V_{GS}=0V		0.8	1.1	V
Diode Continuous Forward Current (Note3)	I_S				20	A
Reverse Recovery Time	t_{RR}	I_{DS}=7.5A, dI/dt=100A/μs		21		ns
Reverse Recovery Charge	Q_{RR}			16		nC

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	-1.3	-2	-2.5	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-6A		45	50	mΩ
		V_{GS}=-5V, I_D=-3.5A		52	73	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{GS}=0V,V_{DS}=-20V,f=1.0MHz		970		pF
Output Capacitance	C_{OSS}			100		pF
Reverse Transfer Capacitance	C_{RSS}			70		pF
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	V_{DS}=-20V, V_{GS}=-10V, I_D=-1A, R_G=6Ω, R_L=20Ω		5	10	ns
Turn-ON Rise Time	t_R			11	21	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			37	68	ns
Turn-OFF Fall Time	t_F			12	23	ns
Total Gate Charge (Note2)	Q_G	V_{DS}=-20V, V_{GS}=-10V, I_D=-6A		17	24	nC
Gate-Source Charge	Q_{GS}			2.2		nC
Gate-Drain Charge	Q_{GD}			4		nC

■ ELECTRICAL CHARACTERISTICS(Cont.)

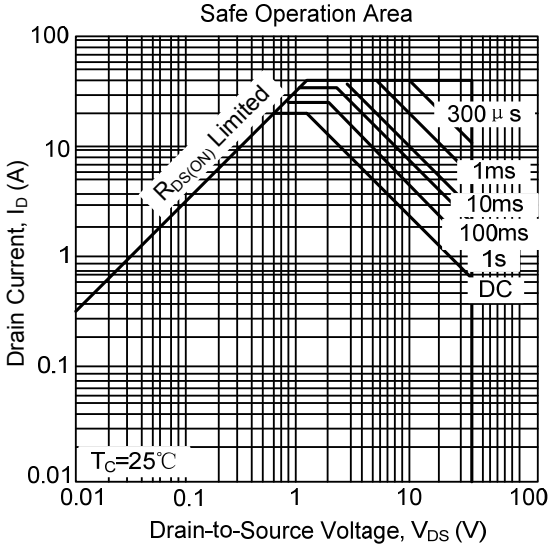
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	T_J=25℃, I_S=-2A, V_{GS}=0V		-0.8	-1.1	V
Diode Continuous Forward Current (Note3)	I_S				-18	A
Reverse Recovery Time	t_{RR}	I_{DS}=-6A, dI/dt=100A/μs		17		ns
Reverse Recovery Charge	Q_{RR}			10		nC

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

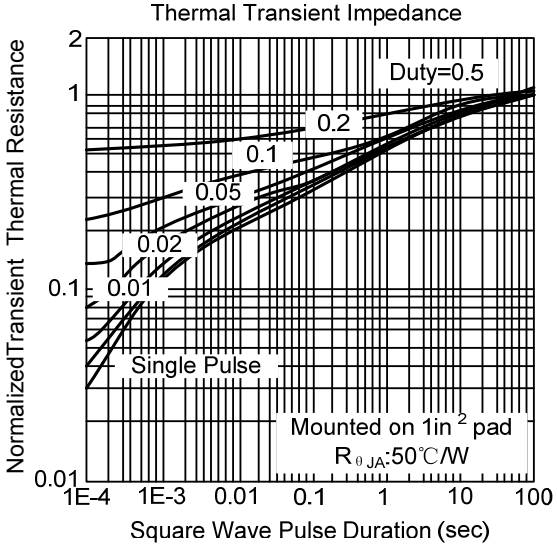
■ TYPICAL CHARACTERISTICS

N-CHANNEL

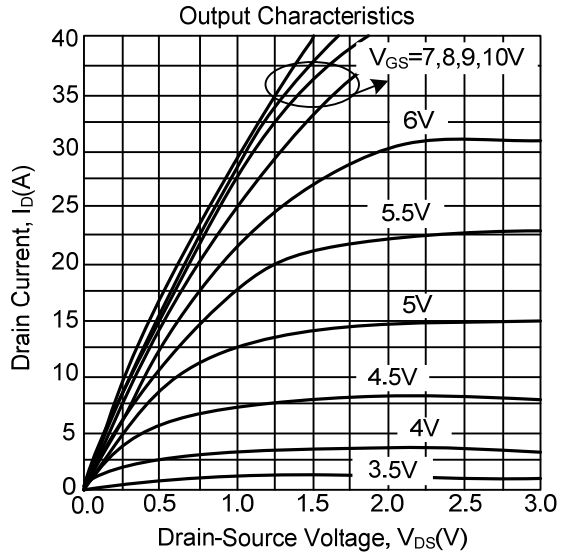
Safe Operation Area



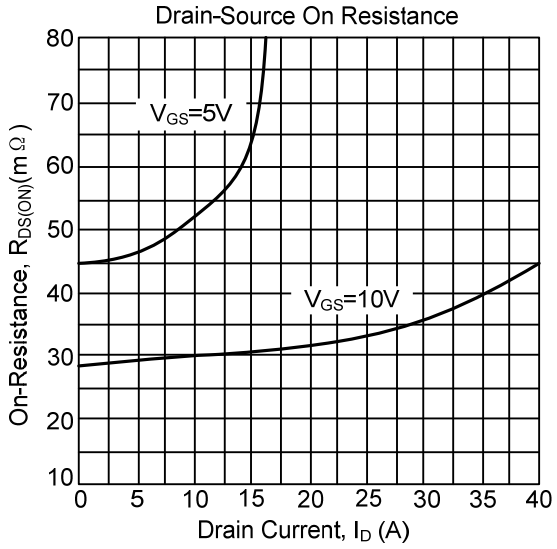
Thermal Transient Impedance



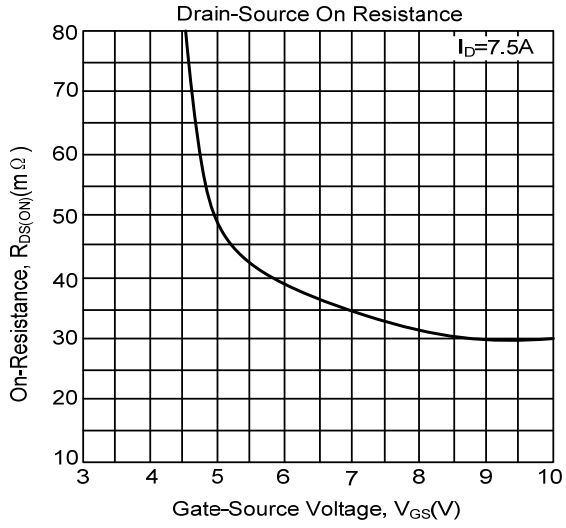
Output Characteristics



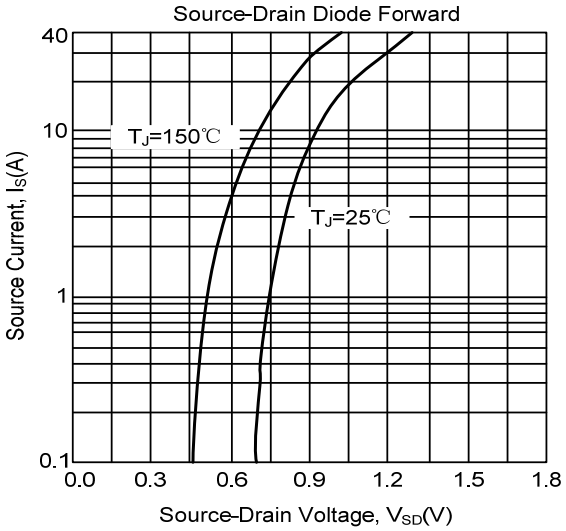
Drain-Source On Resistance



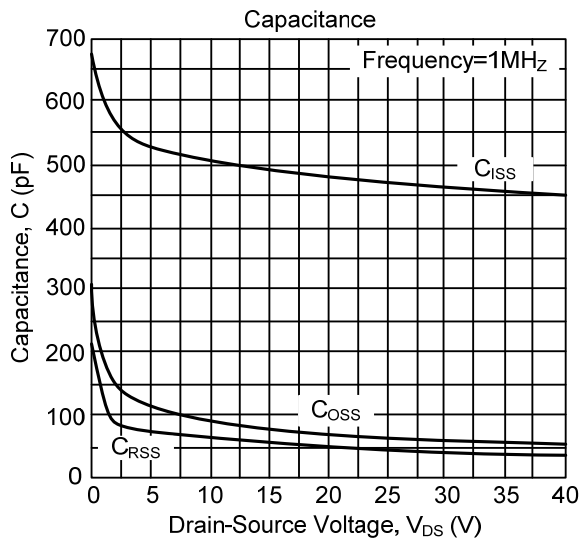
Drain-Source On Resistance

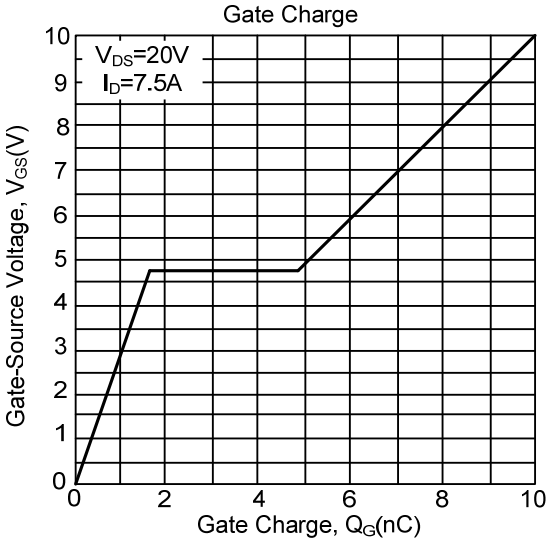


Source-Drain Diode Forward

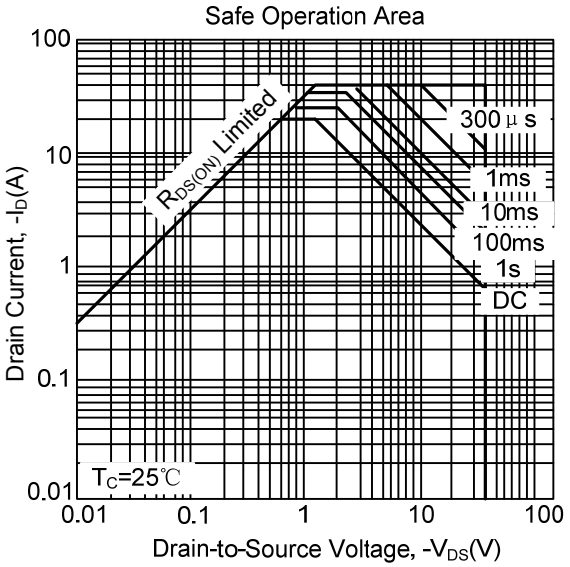


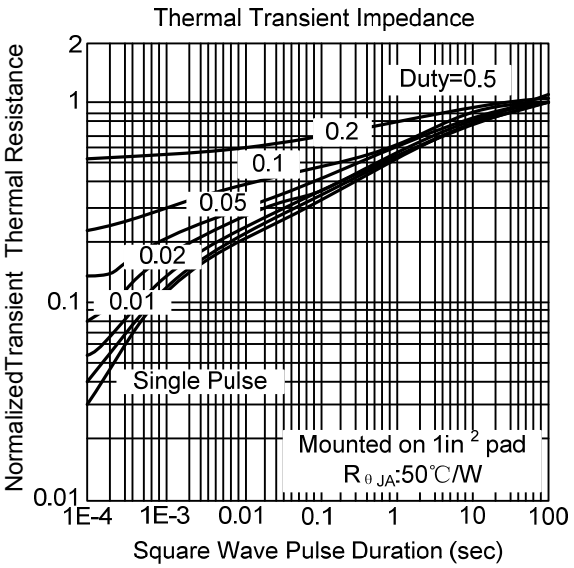
■ TYPICAL CHARACTERISTICS(Cont.)

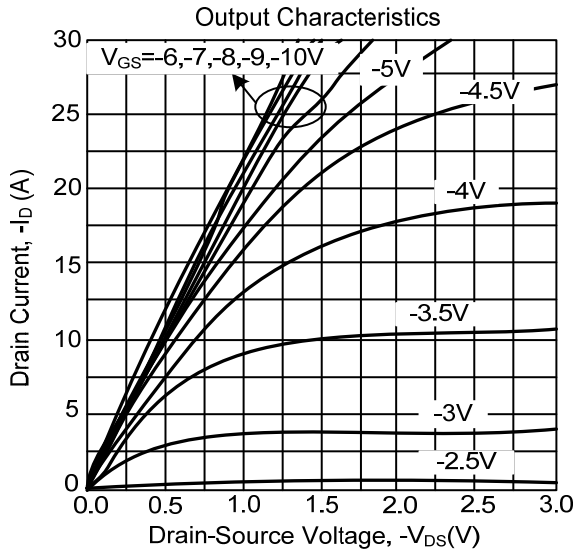


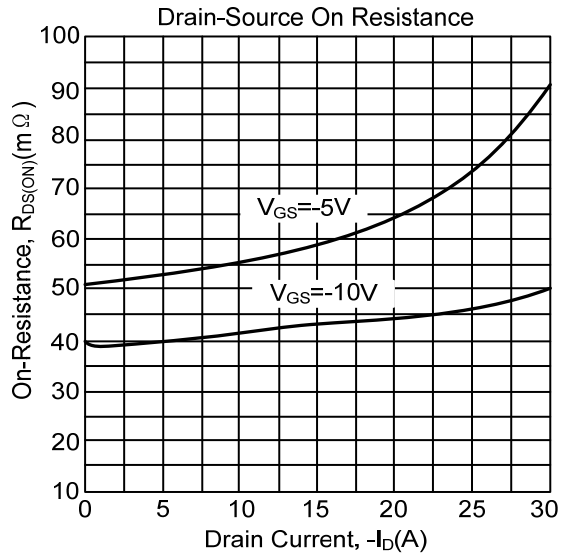


P-CHANNEL









■ TYPICAL CHARACTERISTICS(Cont.)