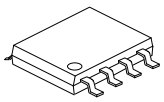
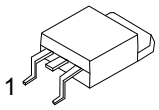
UT20N03

Power MOSFET

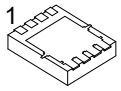
N-CHANNEL ENHANCEMENT MODE



SOP-8



TO-252

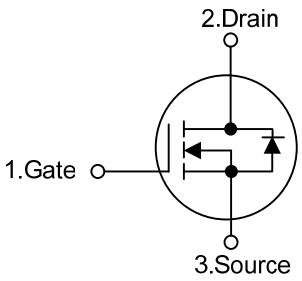


DFN5060-8

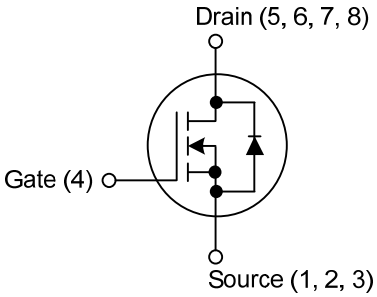
■ FEATURES

* $R_{DS(ON)}$ ≤ 20mΩ @ V_{GS}=10V, I_D =15A
* Low capacitance
* Optimized gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



TO-252



SOP-8 / DFN5060-8

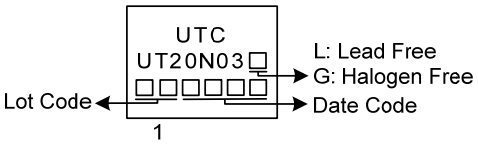
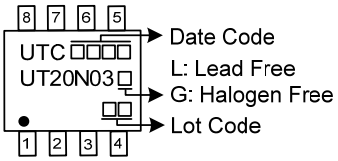
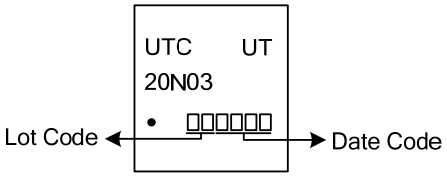
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT20N03L-TN3-R	UT20N03G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT20N03L-S08-R	UT20N03G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT20N03L-K08-5060-R	UT20N03G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

Note: Pin Assignment: G: Gate D: Drain S: Source

UT20N03G-TN3-R (1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) TN3: TO-252, S08: SOP-8, K08-5060: DFN5060-8
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

Package	Marking
TO-252	
SOP-8	
DFN5060-8	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current		I_D	20	A
Pulsed Drain Current (Note 1)		I_{DM}	120	
Avalanche Energy	Single Pulsed (Note 2)	E_{AS}	15	mJ
	Repetitive (Note 1)	E_{AR}	6	
Peak Diode Recovery (Note 3)		dv/dt	6	KV/μs
Power Dissipation	TO-252	P_D	60	W
	SOP-8		1.6	W
	DFN5060-8		21	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 CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	θ_{JA}	100	°C/W
	SOP-8		90	°C/W
	DFN5060-8		46	°C/W
Junction to Case	TO-252	θ_{JC}	2.5	°C/W
	SOP-8		78	°C/W
	DFN5060-8		6	°C/W

Note: The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

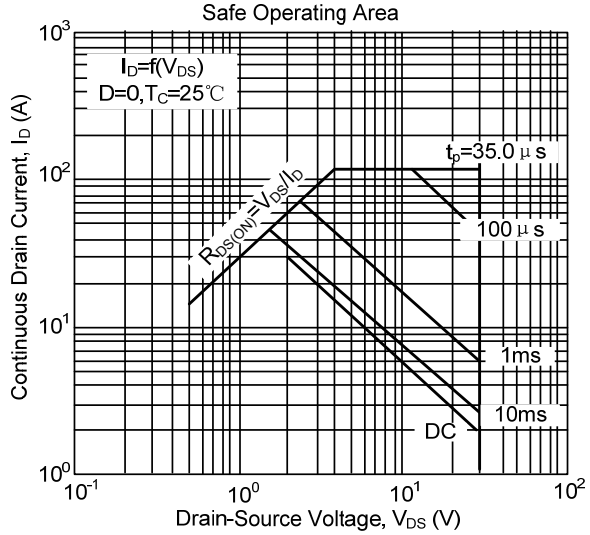
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0 V, I_D =250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} =30V,V_{GS} =0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS} =0 V, V_{GS} = ±20V			±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =25 μA	1.2	1.6	2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D =15A		22.9	31	mΩ
		V_{GS}=10V, I_D =15A		15.5	20	
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS} =25 V, V_{GS} =0V, f=1MHz		530	700	pF
Output Capacitance	C_{OSS}			200	275	
Reverse Transfer Capacitance	C_{RSS}			60	90	
SWITCHING CHARACTERISTICS						
Gate-Source Charge	Q_{GS}	V_{DD}=15V,I_D=15A		2.5	3.1	nC
Gate-Drain Charge	Q_{GD}			6.4	9.6	
Gate Charge Total	Q_G	V_{DD}=15V,I_D=15A, V_{GS}=0~5V		8.4	11	
Turn-On Delay Time	$t_{D(ON)}$	V_{GS}=10V,V_{DD}=15V, R_G=12.7Ω, I_D=15A		6.2	9.3	ns
Turn-On Rise Time	t_R			11	17	
Turn-Off Delay Time	$t_{D(OFF)}$			23	24	
Turn-Off Fall-Time	t_F			18	27	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				30	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				120	
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_F=30A		1.1	1.4	V
Reverse Recovery Time	t_{rr}	V_R=15V,I_F=I_S, dI_F/dt=100A/μs		15	18	ns
Reverse Recovery Charge	Q_{rr}			2	3	nC

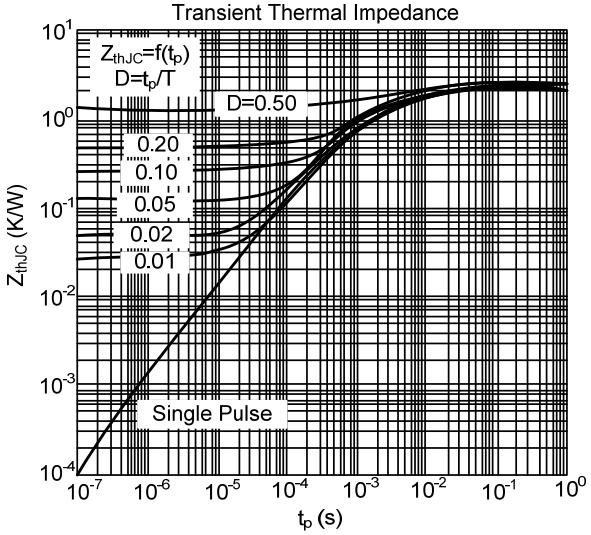
Notes: 1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. I_D = 15A, V_{DD} = 25V, R_G = 25 Ω, Starting T_J = 25°C
3. I_S=30A, V_{DS}=24V, di/dt=200A/μs, $T_{J(MAX)}$=175°C
4. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%
5. Essentially independent of operating temperature

■ TYPICAL CHARACTERISTICS

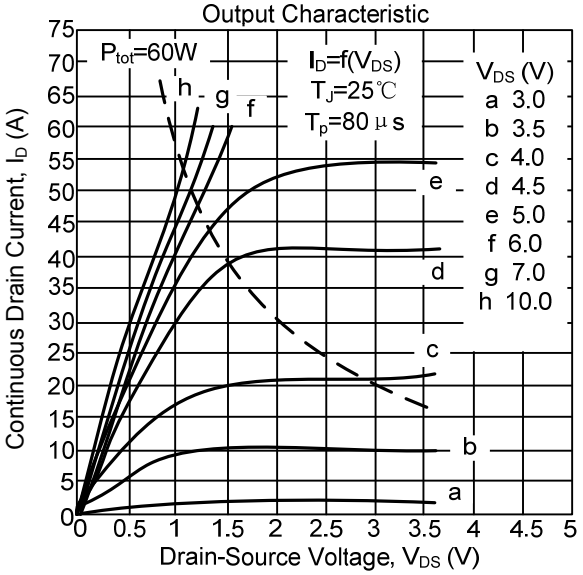
Safe Operating Area



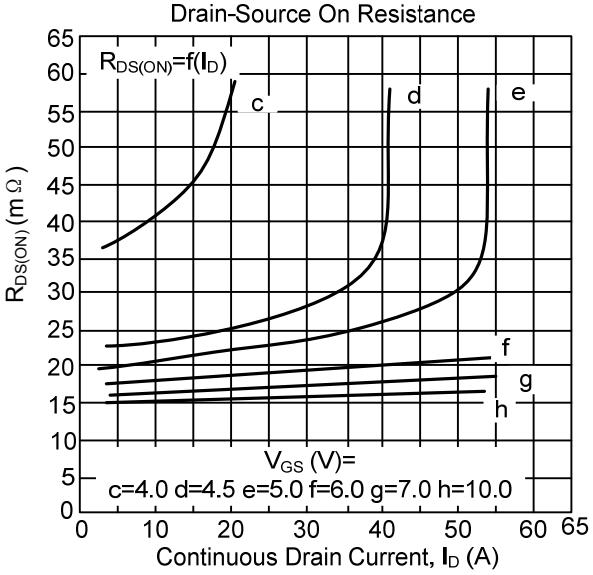
Transient Thermal Impedance



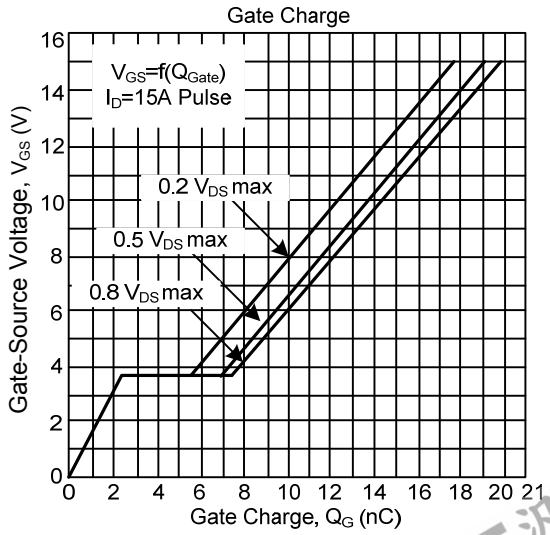
Output Characteristic



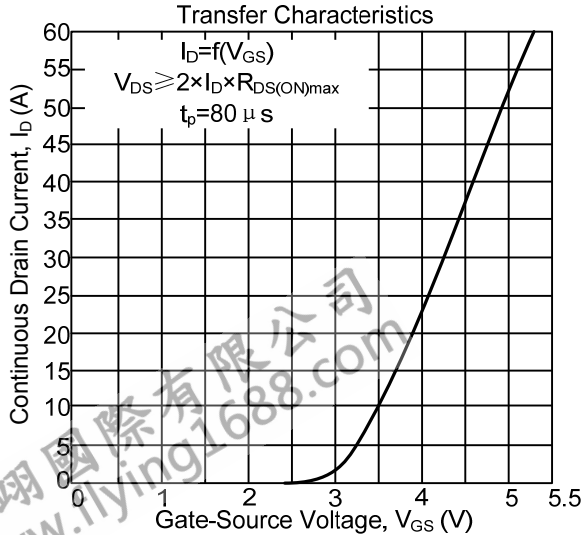
Drain-Source On Resistance



Gate Charge



Transfer Characteristics



■ TYPICAL CHARACTERISTICS (Cont.)