



UT8205K

Preliminary

POWER MOSFET

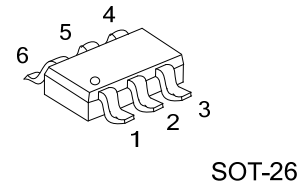
6.0A, 20V N-CHANNEL POWER MOSFET

DESCRIPTION

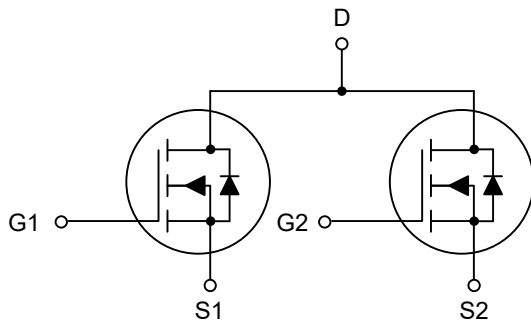
The **UT8205K** uses advanced technology to provide fast switching, low on-resistance and cost-effectiveness. This device is suitable for all commercial-industrial surface mount applications.

FEATURES

- * $R_{DS(ON)} \leq 23 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=6.0\text{A}$
 $R_{DS(ON)} \leq 31 \text{ m}\Omega$ @ $V_{GS}=2.5\text{V}$, $I_D=5.2\text{A}$
- * Fast switching capability
- * Avalanche energy Specified
- * Improved dv/dt capability, high ruggedness



SYMBOL



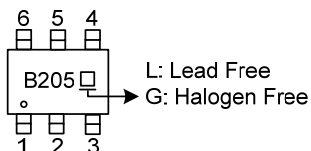
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT8205KL-AG6-R	UT8205KG-AG6-R	SOT-26	S1	D	S2	G2	D	G1	Tape Reel

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

UT8205KG-AG6-R		(1)Packing Type	(1) R: Tape Reel
		(2)Package Type	(2) AG6: SOT-26
		(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING



■ ABSOLUTE MAXIMUM RATING ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	± 8	V
Drain Current	Continuous	I_{D}	6	A
	Pulsed	I_{DM}	20	A
Avalanche energy	Single Pulsed (Note 3)	E_{AS}	10	mJ
Power Dissipation		P_{D}	1.14	W
Junction Temperature		T_{J}	+150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

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. Repetitive Rating: Pulse width limited by maximum junction temperature.

3. $L = 0.1\text{mH}$, $I_{\text{AS}} = 14.1\text{A}$, $V_{\text{DD}} = 30\text{V}$, $R_{\text{G}} = 25\Omega$ Starting $T_{\text{J}} = 25^{\circ}\text{C}$

4. $I_{\text{SD}} \leq 6\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{\text{DD}} \leq BV_{\text{DSS}}$, Starting $T_{\text{J}} = 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	110	$^{\circ}\text{C}/\text{W}$

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

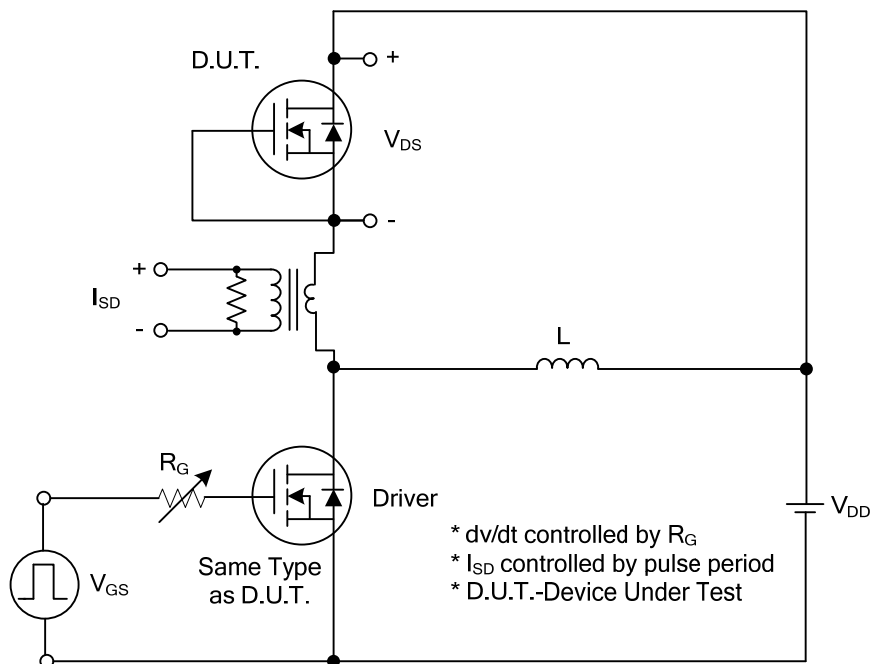
■ ELECTRICAL CHARACTERISTICS ($T_{\text{J}}=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	20			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+8V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-8V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	0.5		1.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =4.5V, I _D =6.0A			23	mΩ
			V _{GS} =2.5V, I _D =5.2A			31	mΩ
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{DS} =15V, V _{GS} =0V, f=1MHz		490		pF
Output Capacitance		C _{OSS}			81		pF
Reverse Transfer Capacitance		C _{RSS}			65		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =16V, V _{GS} =10V, I _D =6.0A (Note 1, 2)		20		nC
Gate to Source Charge		Q _{GS}			2		nC
Gate to Drain Charge		Q _{GD}			3		nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DD} =10V, V _{GS} =10V, I _D =6.0A, R _G =3Ω (Note 1, 2)		4		ns
Rise Time		t _R			16		ns
Turn-off Delay Time		t _{D(OFF)}			91		ns
Fall-Time		t _F			55		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				6	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =6.0A, V _{GS} =0V			1.2	V

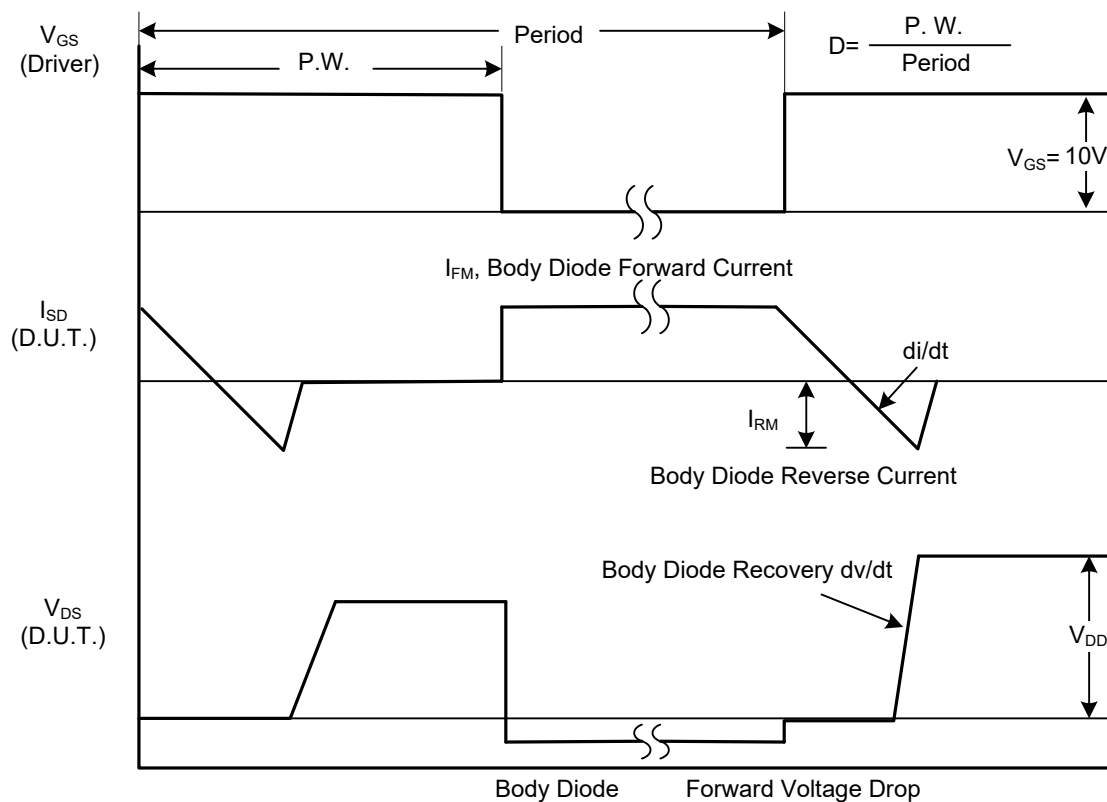
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

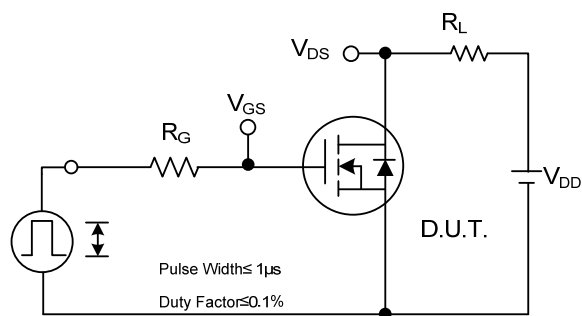


Peak Diode Recovery dv/dt Test Circuit

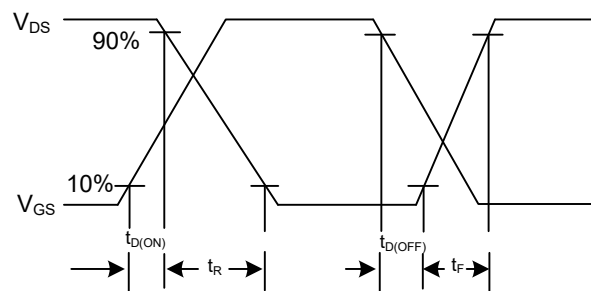


Peak Diode Recovery dv/dt Waveforms

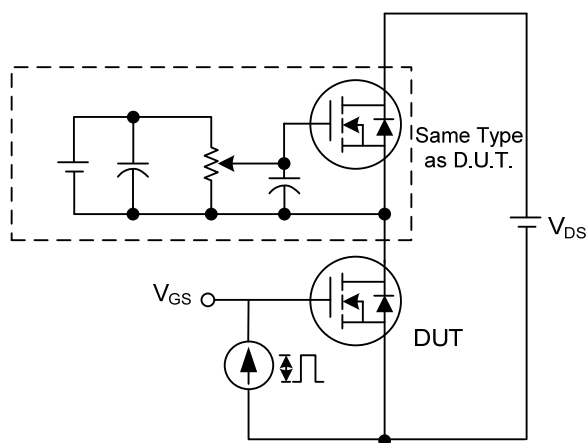
■ TEST CIRCUITS AND WAVEFORMS



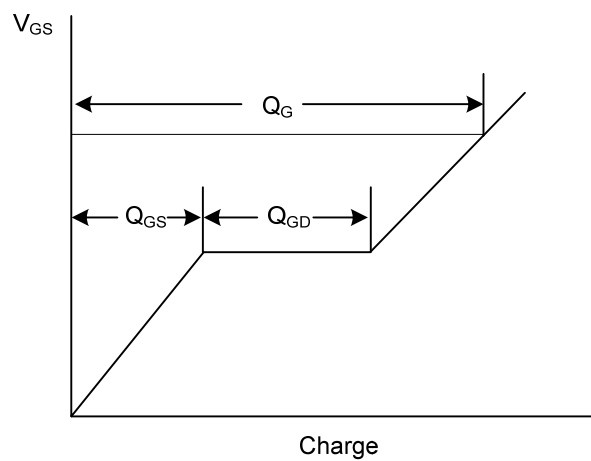
Switching Test Circuit



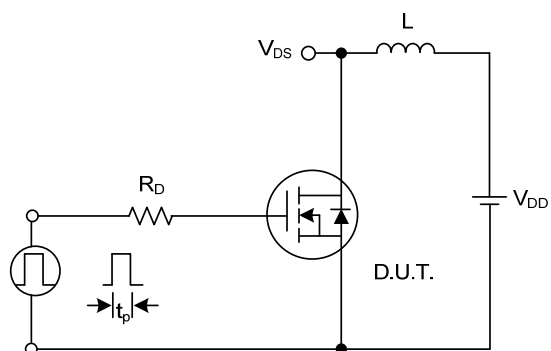
Switching Waveforms



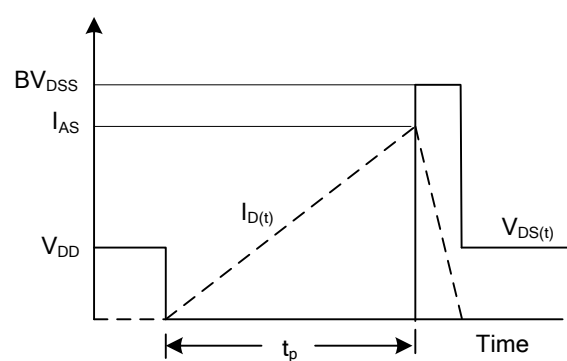
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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