

25N65-CB Preliminary Power MOSFET

25A, 650V N-CHANNEL SUPER-JUNCTION MOSFET

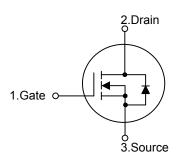
■ DESCRIPTION

The UTC **25N65-CB** is a high voltage power MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

■ FEATURES

- * $R_{DS(ON)}$ < 0.4 Ω @ V_{GS} =10V, I_{D} =12.5A
- * High Switching Speed
- * 100% Avalanche Tested

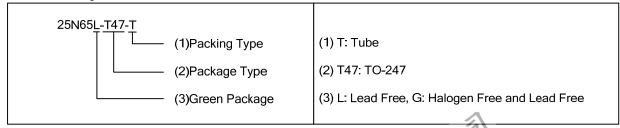
SYMBOL



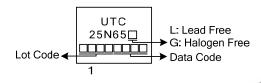
ORDERING INFORMATION

Ordering Number		Dookona	Pin Assignment			Dooking	
Lead Free	Halogen Free	Package	1	2	3	Packing	
25N65L-T47-T	25N65G-T47-T	TO-247	G	D	S	Tube	

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



■ MARKING



1 TO-247

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	650	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	Continuous	I_D	25	Α
	Pulsed (Note 2)	I _{DM}	100	Α
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	205	mJ
Peak Diode Recovery dv/dt		dv/dt	2	V/ns
Power Dissipation		P_{D}	367	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. Repetitive Rating: Pulse width limited by maximum junction temperature.
- 3. L =10mH, I_{AS} = 6.4A, V_{DD} = 50V, R_{G} = 25 Ω , Starting T_{J} = 25 $^{\circ}$ C
- 4. $I_{SD} \le 25A$, di/dt $\le 200A/\mu s$, $V_{DD} \le BV_{DSS}$, Starting $T_J = 25^{\circ}C$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	θ_{JA}	40	°C/W	
Junction to Case	θ_{JC}	0.34	°C/W	

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

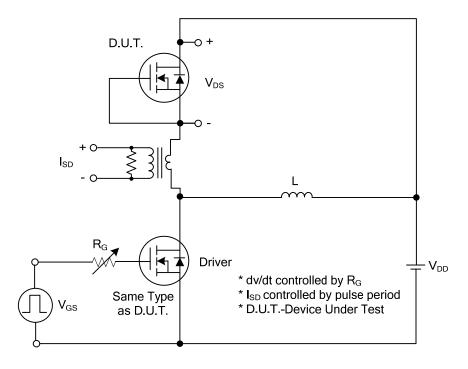
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PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I _D =250μA, V _{GS} =0V	650			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =650V, V _{GS} =0V			1	μΑ
Gate- Source Leakage Current	Forward		V_{GS} =+30V, V_{DS} =0V			+100	nA
	Reverse	I _{GSS}	V_{GS} =-30V, V_{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =12.5A			0.4	Ω
DYNAMIC PARAMETERS							
Input Capacitance	Input Capacitance				4000		pF
Output Capacitance		Coss	V_{GS} =0V, V_{DS} =10V, f=1.0MHz		1200		pF
Reverse Transfer Capacitance		C_{RSS}			15		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	\\ -E0\\ \\ -10\\ -1.2A		274		nC
Gate to Source Charge		Q_GS	V _{DS} =50V, V _{GS} =10V, I _D =1.3A I _G = 100μA (Note1, 2)		24		nC
Gate to Drain Charge		Q_GD	IG- 100μΑ (Note 1, 2)		26		nC
Turn-ON Delay Time		$t_{D(ON)}$			152		ns
Rise Time		t_R	V _{DS} =30V, V _{GS} =10V, I _D =0.5A,		128		ns
Turn-OFF Delay Time		t _{D(OFF)}	R _G =25Ω (Note1, 2)		816		ns
Fall-Time		t_{F}			188		ns
SOURCE- DRAIN DIODE RATII	NGS AND	CHARACTERIS	STICS				
Maximum Body-Diode Continuou	us Current	Is	2 113	5		25	Α
Maximum Body-Diode Pulsed Current		I _{SM}	The co),,		100	Α
Drain-Source Diode Forward Voltage		V_{SD}	I _S =25A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time		t _{rr}	I _S =25A, V _{GS} =0V,		464		ns
Body Diode Reverse Recovery Charge		Q _{rr}	dl₅/dt=100A/µs (Note 1)		7.4		μC

Notes: 1. Pulse Test : Pulse width \leq 300 μ s, Duty cycle \leq 2%.

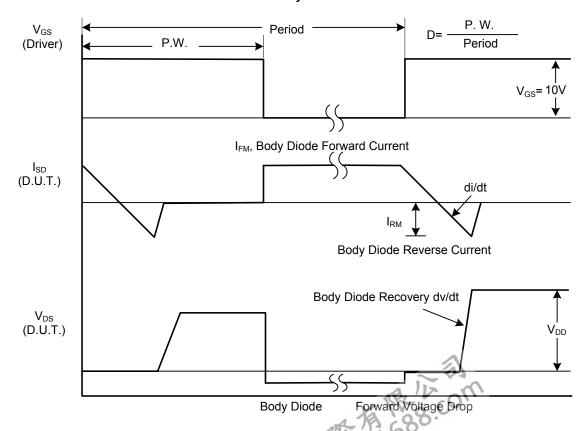
2. Essentially independent of operating ambient temperature.



■ TEST CIRCUITS AND WAVEFORMS



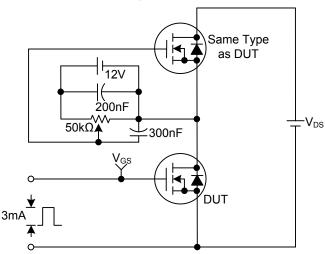
Peak Diode Recovery dv/dt Test Circuit



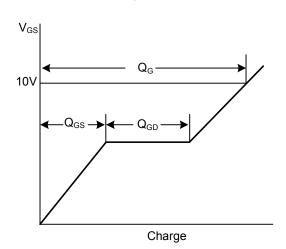
Peak Diode Recovery dwdt Waveforms

■ TEST CIRCUITS AND WAVEFORMS (Cont.)

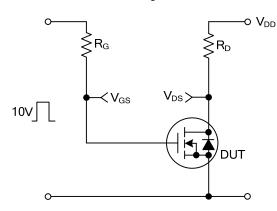
Gate Charge Test Circuit



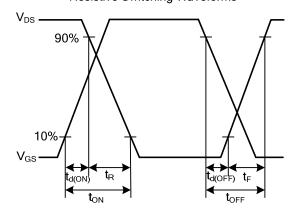
Gate Charge Waveforms



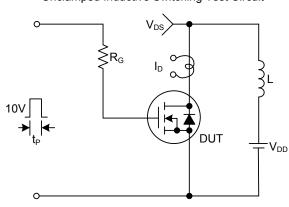
Resistive Switching Test Circuit



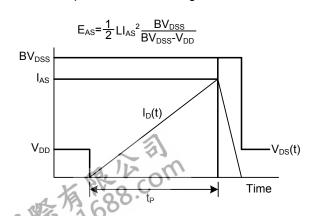
Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



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