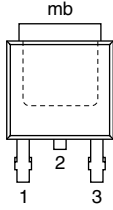
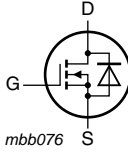


[1] Continuous current is limited by package.

2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	gate		
2	D	drain ^[1]		
3	S	source		
mb	D	mounting base; connected to drain		

SOT428 (DPAK)

[1] It is not possible to make connection to pin 2.

3. Ordering information

Table 3. Ordering information

Type number	Package		Version
	Name	Description	
BUK724R5-30C	DPAK	plastic single-ended surface-mounted package (DPAK); 3 leads (one lead cropped)	SOT428

4. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
V_{DS}	drain-source voltage	$T_j \geq 25\text{ °C}; T_j \leq 175\text{ °C}$	-	-	30	V	
V_{DGR}	drain-gate voltage	$R_{GS} = 20\text{ k}\Omega$	-	-	30	V	
V_{GS}	gate-source voltage		-20	-	20	V	
I_D	drain current	$V_{GS} = 10\text{ V}; T_j = 25\text{ °C}$; see Figure 1 ; see Figure 4	[1]	-	-	136	A
		$T_{mb} = 100\text{ °C}; V_{GS} = 10\text{ V}$; see Figure 1	[2]	-	-	75	A
		$V_{GS} = 10\text{ V}; T_j = 25\text{ °C}$; see Figure 1	[2]	-	-	75	A
I_{DM}	peak drain current	$t_p \leq 10\text{ }\mu\text{s}$; pulsed; $T_j = 25\text{ °C}$; see Figure 4	-	-	543	A	
P_{tot}	total power dissipation	$T_{mb} = 25\text{ °C}$; see Figure 2	-	-	157	W	
T_{stg}	storage temperature		-55	-	175	°C	
T_j	junction temperature		-55	-	175	°C	
Source-drain diode							
I_S	source current	$T_{mb} = 25\text{ °C}$	[2]	-	-	75	A
			[1]	-	-	136	A
I_{SM}	peak source current	$t_p \leq 10\text{ }\mu\text{s}$; pulsed; $T_{mb} = 25\text{ °C}$	-	-	543	A	
Avalanche ruggedness							
$E_{DS(AL)S}$	non-repetitive drain-source avalanche energy	$I_D = 75\text{ A}; V_{sup} \leq 30\text{ V}; R_{GS} = 50\text{ }\Omega$; $V_{GS} = 10\text{ V}; T_{j(init)} = 25\text{ °C}$; unclamped	-	-	329	mJ	
$E_{DS(AL)R}$	repetitive drain-source avalanche energy	see Figure 3	[3][4][5]	-	-	J	

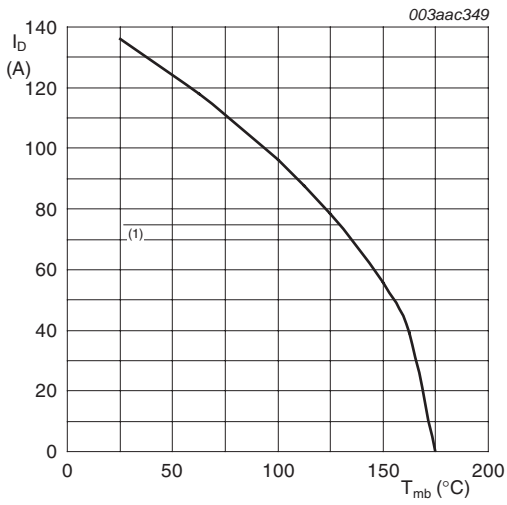
[1] Current is limited by power dissipation chip rating.

[2] Continuous current is limited by package.

[3] Single-pulse avalanche rating limited by maximum junction temperature of 175 °C.

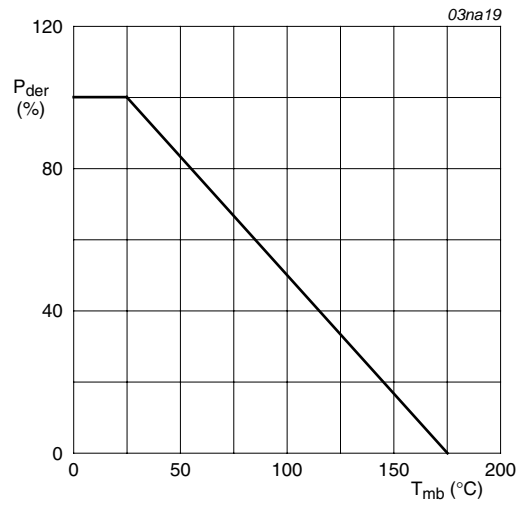
[4] Repetitive avalanche rating limited by average junction temperature of 170 °C.

[5] Refer to application note AN10273 for further information.



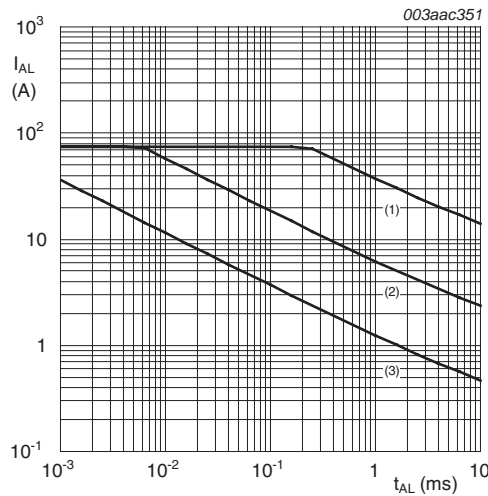
$V_{GS} \geq 5V$
 (1) Capped at 75 A due to package.

Fig 1. Continuous drain current as a function of mounting base temperature



$$P_{der} = \frac{P_{tot}}{P_{tot(25^{\circ}C)}} \times 100\%$$

Fig 2. Normalized total power dissipation as a function of mounting base temperature



- (1) Single-pulse; $T_j = 25^{\circ}C$.
- (2) Single-pulse; $T_j = 150^{\circ}C$.
- (3) Repetitive.

Fig 3. Single-pulse and repetitive avalanche rating; avalanche current as a function of avalanche time

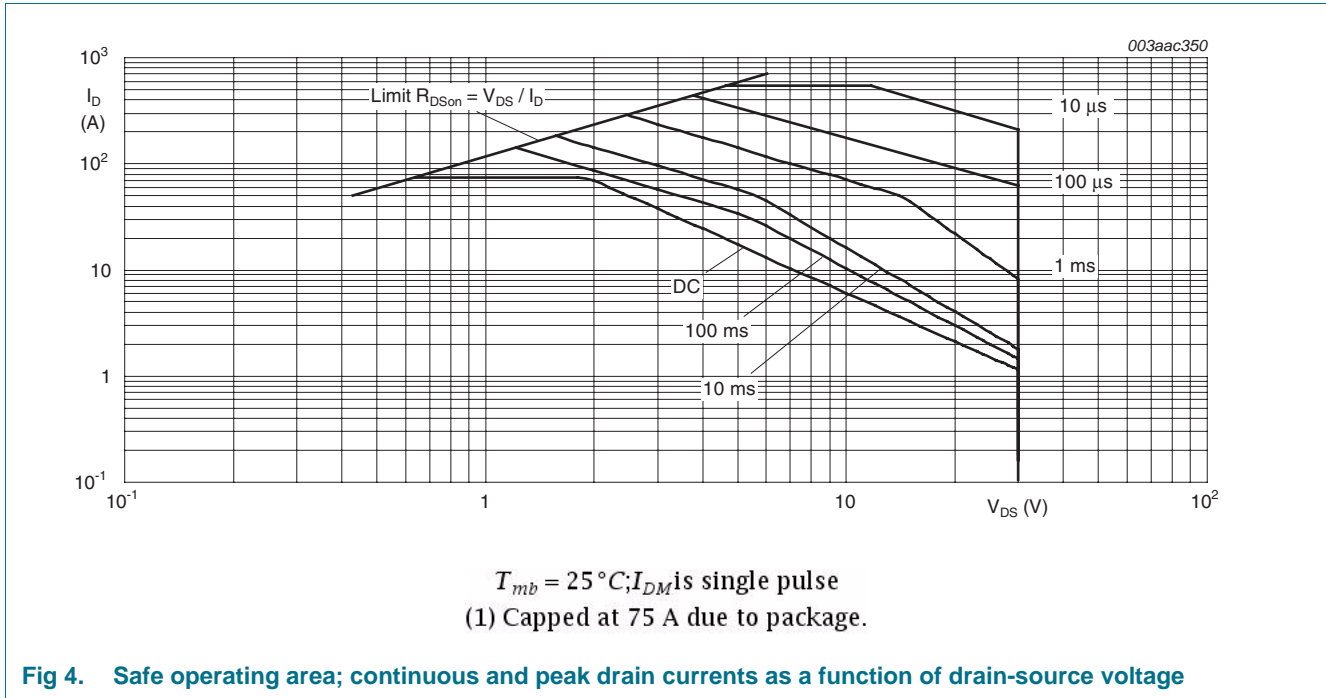


Fig 4. Safe operating area; continuous and peak drain currents as a function of drain-source voltage

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	see Figure 5	-	0.65	0.95	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient		-	70	-	K/W

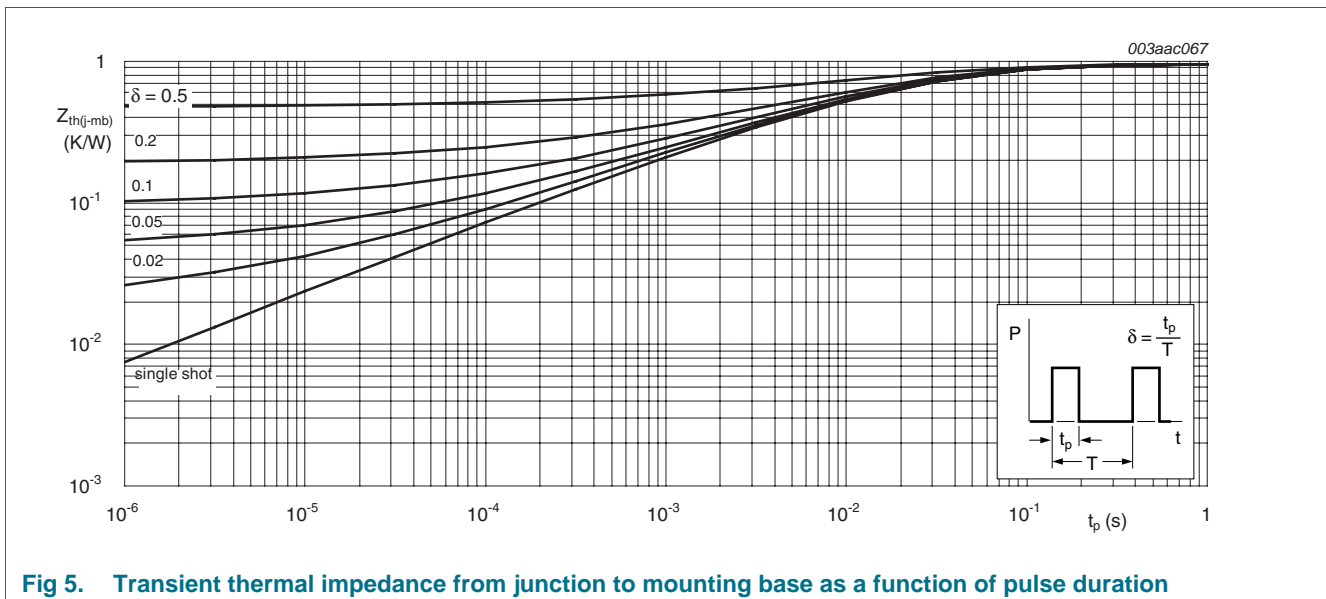


Fig 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

6. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
$V_{(BR)DSS}$	drain-source breakdown voltage	$I_D = 0.25 \text{ mA}; V_{GS} = 0 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	30	-	-	V
		$I_D = 0.25 \text{ mA}; V_{GS} = 0 \text{ V}; T_j = -55 \text{ }^\circ\text{C}$	27	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$I_D = 1 \text{ mA}; V_{DS} = V_{GS}; T_j = 25 \text{ }^\circ\text{C};$ see Figure 10 ; see Figure 11	2	3	4	V
		$I_D = 1 \text{ mA}; V_{DS} = V_{GS}; T_j = 175 \text{ }^\circ\text{C};$ see Figure 10	1	-	-	V
		$I_D = 1 \text{ mA}; V_{DS} = V_{GS}; T_j = -55 \text{ }^\circ\text{C};$ see Figure 10	-	-	4.4	V
I_{DSS}	drain leakage current	$V_{DS} = 30 \text{ V}; V_{GS} = 0 \text{ V}; T_j = 175 \text{ }^\circ\text{C}$	-	-	500	μA
		$V_{DS} = 30 \text{ V}; V_{GS} = 0 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	0.02	1	μA
I_{GSS}	gate leakage current	$V_{DS} = 0 \text{ V}; V_{GS} = 20 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	2	100	nA
		$V_{DS} = 0 \text{ V}; V_{GS} = -20 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	2	100	nA
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = 10 \text{ V}; I_D = 25 \text{ A}; T_j = 175 \text{ }^\circ\text{C};$ see Figure 12	-	-	8.5	m Ω
		$V_{GS} = 10 \text{ V}; I_D = 25 \text{ A}; T_j = 25 \text{ }^\circ\text{C};$ see Figure 12 ; see Figure 13	-	3.8	4.5	m Ω
Dynamic characteristics						
$Q_{G(tot)}$	total gate charge	$I_D = 25 \text{ A}; V_{DS} = 24 \text{ V}; V_{GS} = 10 \text{ V};$ $T_j = 25 \text{ }^\circ\text{C};$ see Figure 14	-	62	-	nC
Q_{GS}	gate-source charge	$I_D = 25 \text{ A}; V_{DS} = 24 \text{ V}; V_{GS} = 10 \text{ V};$ $T_j = 25 \text{ }^\circ\text{C};$ see Figure 14	-	14	-	nC
Q_{GD}	gate-drain charge	$I_D = 25 \text{ A}; V_{DS} = 24 \text{ V}; V_{GS} = 10 \text{ V};$ $T_j = 25 \text{ }^\circ\text{C};$ see Figure 14	-	21	-	nC
C_{iss}	input capacitance	$V_{GS} = 0 \text{ V}; V_{DS} = 25 \text{ V}; f = 1 \text{ MHz};$ $T_j = 25 \text{ }^\circ\text{C};$ see Figure 15	-	2820	3760	pF
C_{oss}	output capacitance		-	670	804	pF
C_{rss}	reverse transfer capacitance		-	422	580	pF
$t_{d(on)}$	turn-on delay time	$V_{DS} = 25 \text{ V}; R_L = 1 \text{ }^\Omega; V_{GS} = 10 \text{ V};$ $R_{G(ext)} = 10 \text{ }^\Omega; T_j = 25 \text{ }^\circ\text{C}$	-	24	-	ns
t_r	rise time	$V_{DS} = 25 \text{ V}; R_L = 1 \text{ }^\Omega; V_{GS} = 10 \text{ V};$ $R_{G(ext)} = 10 \text{ }^\Omega; T_j = 25 \text{ }^\circ\text{C}$	-	51	-	ns
$t_{d(off)}$	turn-off delay time	$V_{DS} = 25 \text{ V}; R_L = 1 \text{ }^\Omega; V_{GS} = 10 \text{ V};$ $R_{G(ext)} = 10 \text{ }^\Omega; T_j = 25 \text{ }^\circ\text{C}$	-	85	-	ns
t_f	fall time		-	62	-	ns
L_D	internal drain inductance	measured from drain to centre of die ; $T_j = 25 \text{ }^\circ\text{C}$	-	2.5	-	nH
L_S	internal source inductance	measured from source lead to source bond pad ; $T_j = 25 \text{ }^\circ\text{C}$	-	7.5	-	nH

