

DKG1020

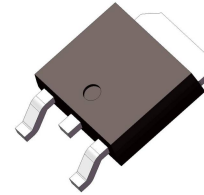
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Features

- Low on-state resistance
- Built-in gate protection diode
- SMD PKG

Package

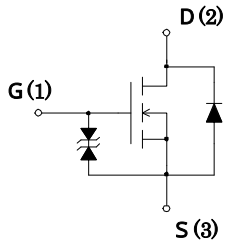
TO252



Applications

- DC / DC converter
- Switching

Internal Equivalent Circuit



Key Specifications

- $V_{(BR)DSS} = 100V$ ($I_D = 100\mu A$)
- $R_{DS(ON)} = 52 m\Omega$ max. ($V_{GS} = 10V, I_D = 10A$)
- $R_{DS(ON)} = 59 m\Omega$ max. ($V_{GS} = 4.5V, I_D = 10A$)

Absolute maximum ratings

($T_a = 25^\circ C$)

Characteristic	Symbol	Rating	Unit
Drain to Source Voltage	V_{DSS}	100	V
Gate to Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current	I_D	± 20	A
Maximum Power Dissipation	P_D	40 ($T_c = 25^\circ C$)	W
Single Pulse Avalanche Energy	E_{AS}^{*1}	62.5	mJ
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature	T_{stg}	-55 to +150	$^\circ C$
Maximum Drain to Source dv/dt	dv/dt 1 ^{*1}	0.6	V/ns
Peak diode recovery dv/dt	dv/dt 2 ^{*2}	5	V/ns
Peak diode recovery di/dt	di/dt ^{*2}	100	A/ μs

*1 $V_{DD} = 14V, L = 1mH, I_L = 11A$, unclamped, See Fig.1

*2 $I_{SD} = 20A$, See Fig.2

Electrical characteristics

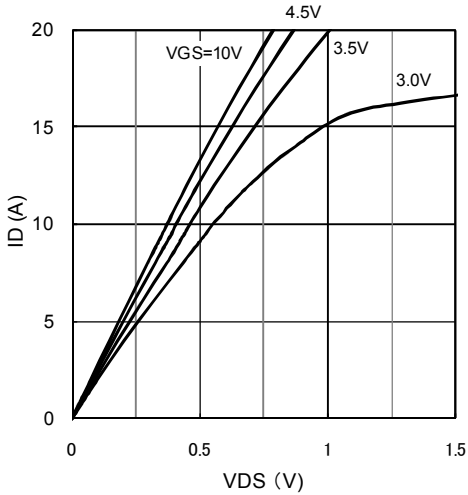
(Ta=25°C)

Characteristic	Symbol	Test Conditions	Limits			Unit
			MIN	TYP	MAX	
Drain to Source breakdown Voltage	$V_{(BR)DSS}$	$I_D=100\mu A, V_{GS}=0V$	100			V
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V$			± 10	μA
Drain to Source Leakage Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			100	μA
Gate Threshold Voltage	V_{TH}	$V_{DS}=10V, I_D=1mA$	1.5	2.0	2.5	V
Forward Transconductance	$Re(yfs)$	$V_{DS}=10V, I_{D1}=10A$	9.0			S
Static Drain to Source On-Resistance	$R_{DS(ON)}$	$I_D=10A, V_{GS}=10V$		41	52	m Ω
		$I_D=10A, V_{GS}=4.5V$		45	59	
Input Capacitance	C_{iss}	$V_{DS}=10V$ $V_{GS}=0V$ $f=1MHz$		2200		pF
Output Capacitance	C_{oss}			210		
Reverse Transfer Capacitance	C_{rss}			110		
Turn-On Delay Time	$t_{d(on)}$	$I_D=10A, V_{DD}=50V$ $R_G=20\Omega, R_L=5\Omega$ $V_{GS}=10V$ See Fig.3		40		ns
Rise Time	t_r			140		
Turn-Off Delay Time	$t_{d(off)}$			280		
Fall Time	t_f			340		
Total Gate Charge	Q_g	$V_{DD}=50V$ $V_{GS}=10V$ $I_D=20V$		47		nC
Gate to Source Charge	Q_{gs}			8		
Gate to Source Charge	Q_{gd}			7		
Source-Drain Diode Forward Voltage	V_{SD}	$I_{SD}=20A, V_{GS}=0V$		0.9	1.2	V
Source-Drain Diode Reverse Recovery Time	t_{rr}	$I_{SD}=20A$ $di/dt=100A/\mu s$		50		ns
Source-Drain Diode Reverse Recovery Time	Q_{rr}			60		nC
Thermal Resistance Junction to Case	$R_{th(ch-c)}$				3.125	$^{\circ}C/W$

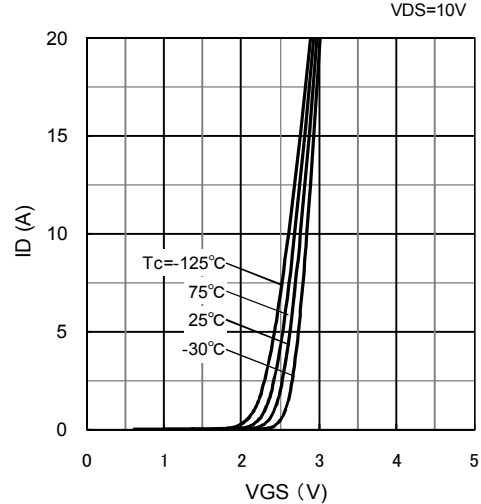
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Characteristic Curves (Tc=25°C)

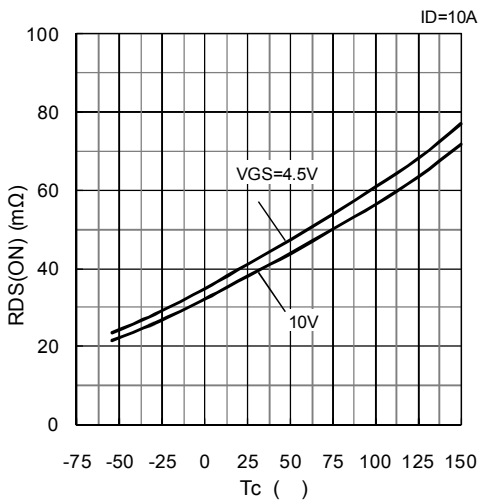
ID - VDS characteristics (typical)



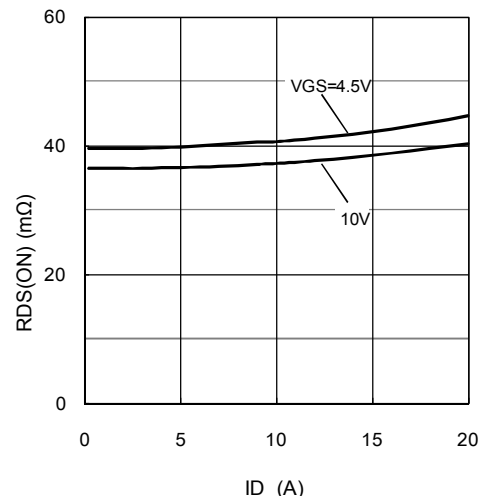
ID - VGS characteristics (typical)



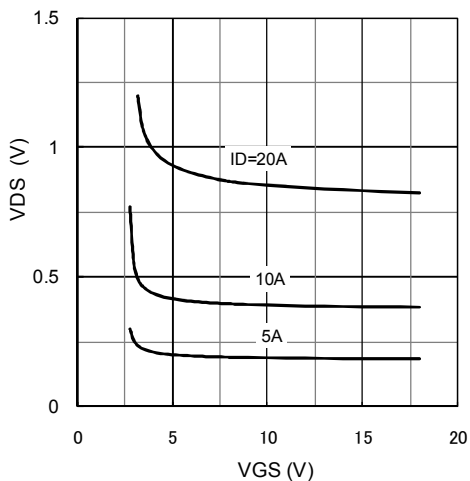
RDS(ON) - Tc characteristics (typical)



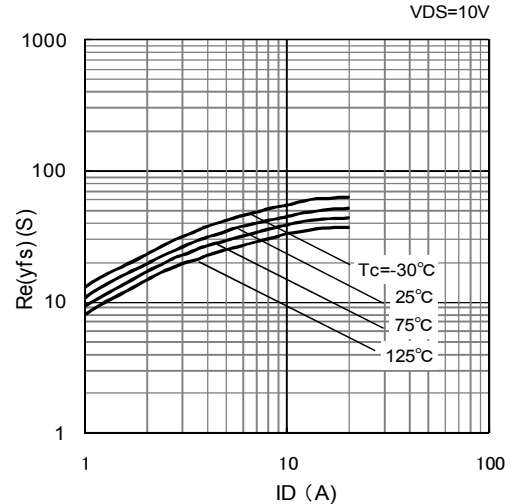
RDS(ON) - ID characteristics (typical)



VDS - VGS characteristics (typical)

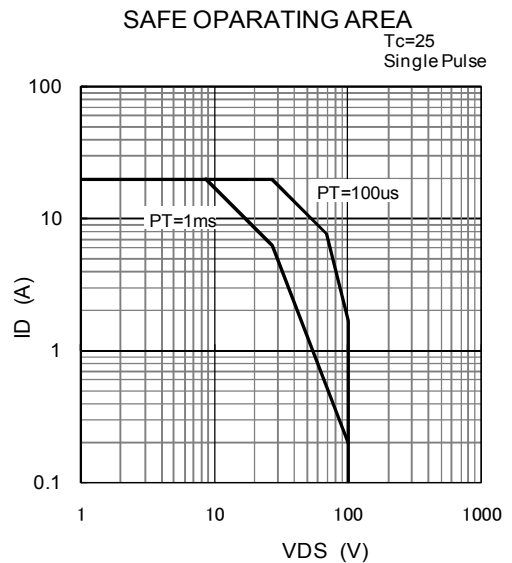
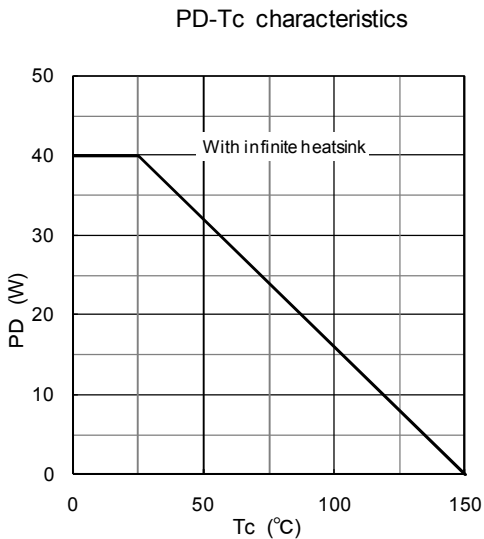
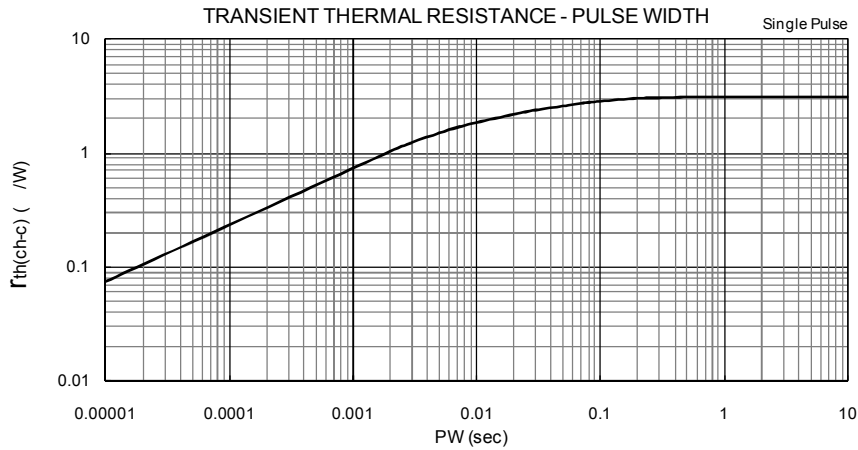
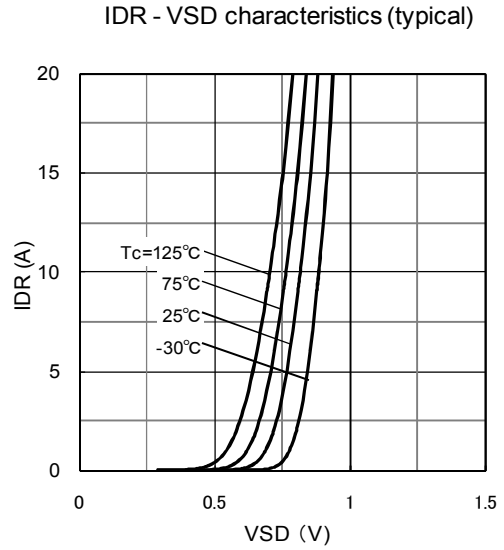
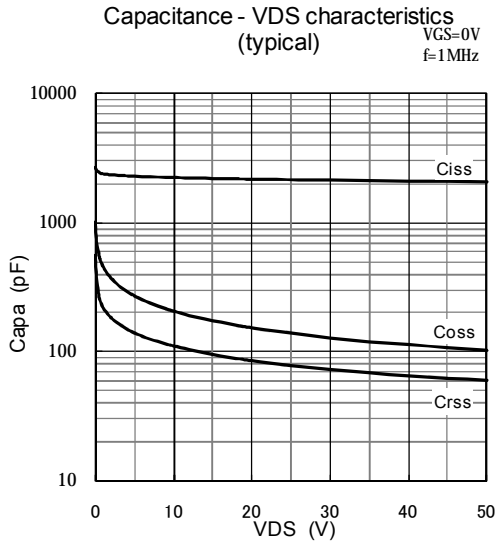


Re(yfs) - ID characteristics (typical)



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Characteristic Curves (Tc=25°C)



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Fig.1 Unclamped Inductive Test Method

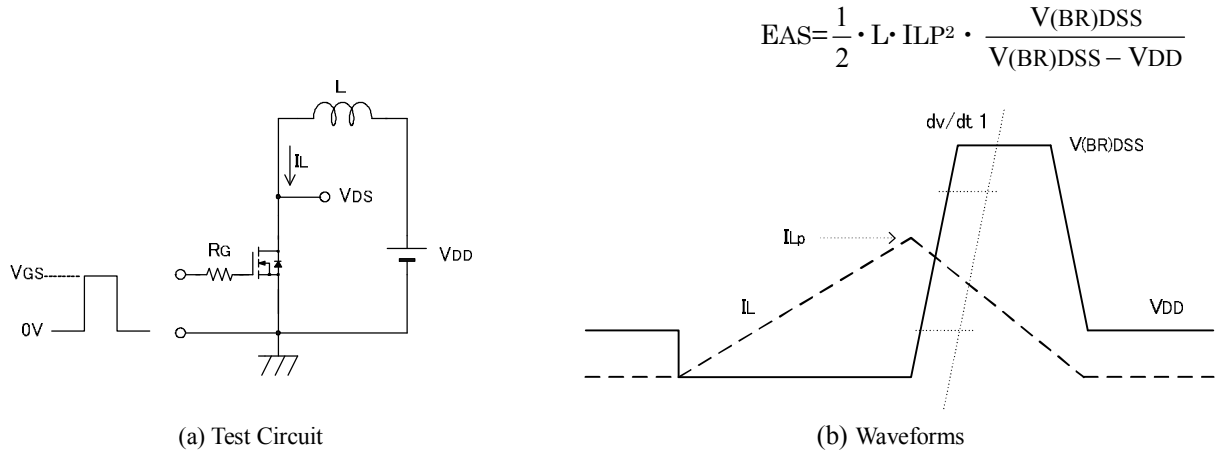


Fig.2 Diode Reverse Recovery Time Test Method

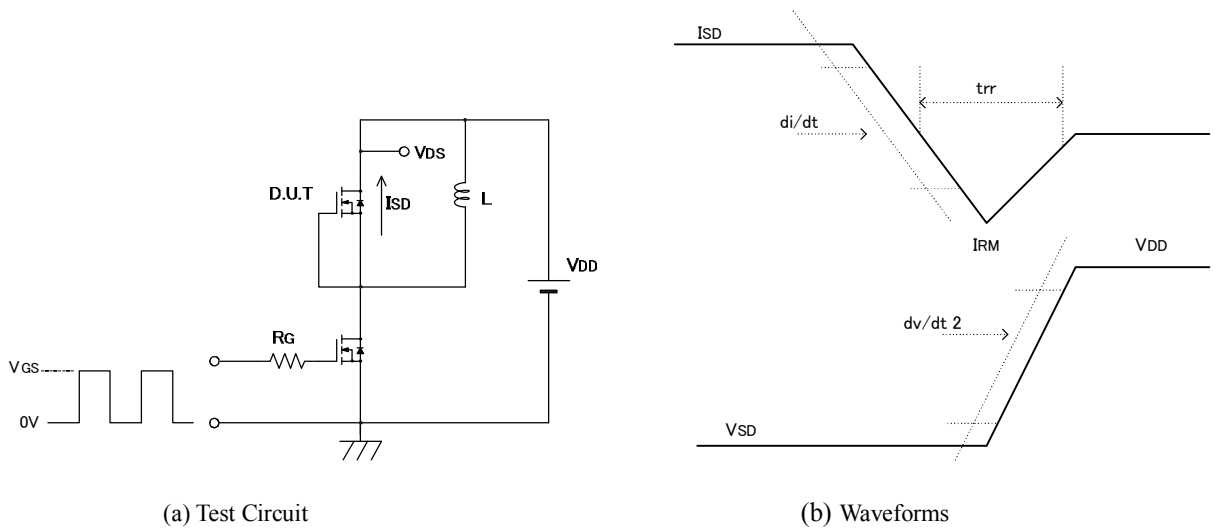
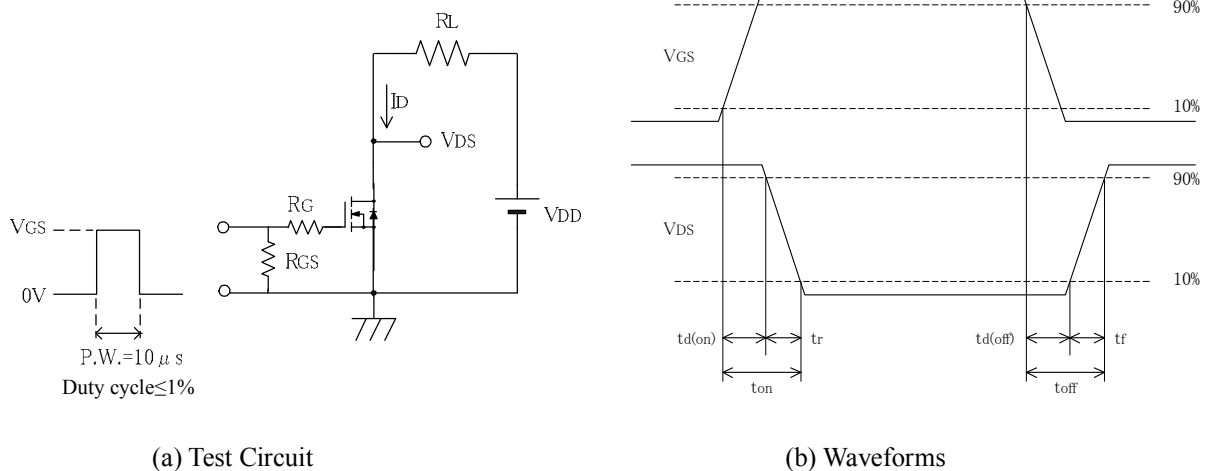


Fig.3 Switching Time Test Method



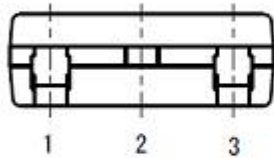
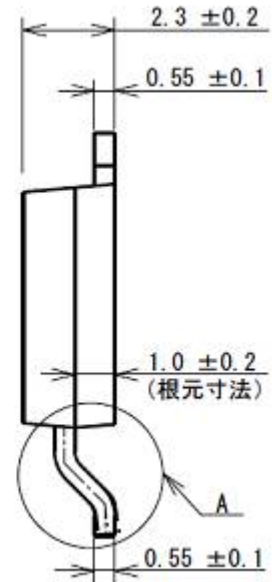
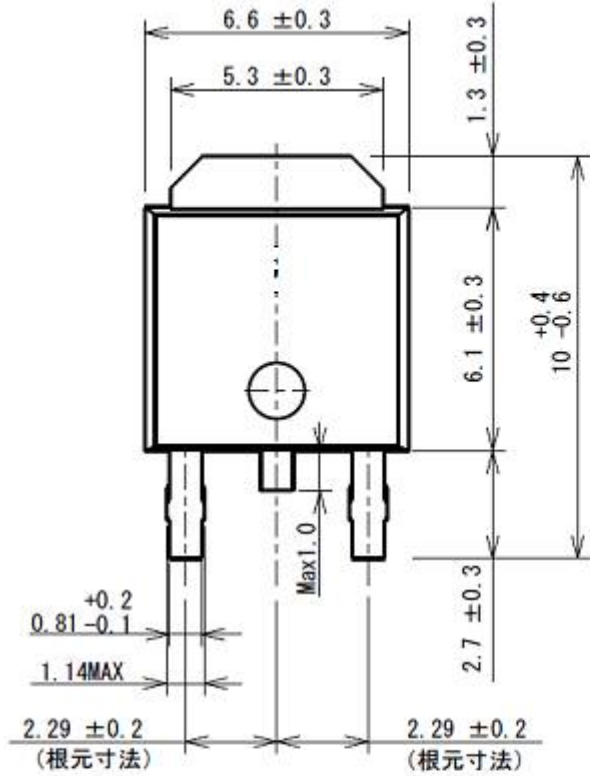
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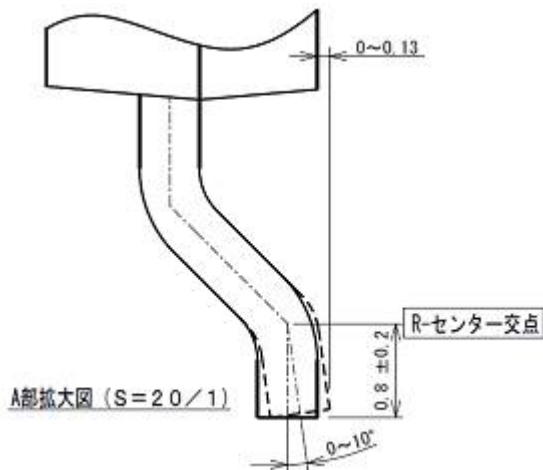
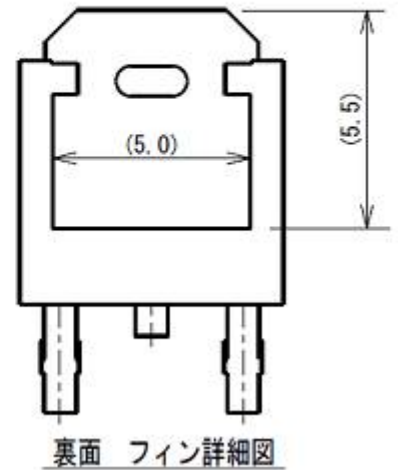
Outline

TO252



Pin assignment

- (1) Gate
- (2) Drain
- (3) Source



Weight Approx.0.33g