

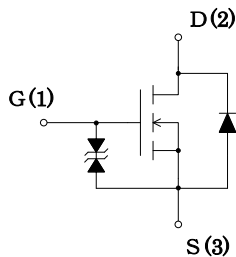
Features

- Low on-state resistance 5.0mΩ VGS=10V
- Built-in gate protection diode
- SMD PKG

Applications

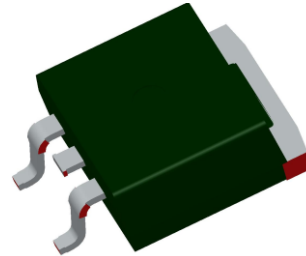
- DC-DC converter
- Mortar drive

Internal Equivalent Circuit



Package

TO220S



Key Specifications

- V(BR)DSS = 60V (ID=100uA)
- RDS(ON) = 5mΩ max (ID=35A / VGS=10V)

Absolute maximum ratings

(Ta=25°C)

Characteristic	Symbol	Rating	Unit
Drain to Source Voltage	V _{DSS}	60	V
Gate to Source Voltage	V _{GSS}	±20	V
Continuous Drain Current	I _D	±85	A
Pulsed Drain Current	I _{D(pulse)} *1	±170	A
Maximum Power Dissipation	P _D	100 (Tc=25°C)	W
Single Pulse Avalanche Energy	E _{AS} *2	400	mJ
Maximum avalanche current	I _{AS}	25	A
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 ~ +150	°C
Maximum Drain to Source dv/dt 1	dv/dt 1 *2	0.5	V/ns
Peak diode recovery dv/dt 2	dv/dt 2 *3	3	V/ns
Peak diode recovery di/dt	di/dt *3	100	A/μs

*1 PW≤100μsec. duty cycle≤1%

*2 V_{DD}=20V, L=1mH, I_L=25A, unclamped, R_g=50Ω, See Fig.1

*3 I_{SD}=25A, See Fig.2

Electrical characteristics

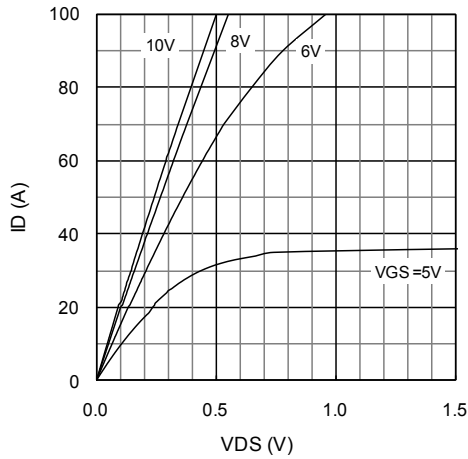
(Ta=25°C)

Characteristic	Symbol	Test Conditions	Limits			Unit
			MIN	TYP	MAX	
Drain to Source breakdown Voltage	$V_{(BR)DSS}$	$I_D=100\mu A$ $V_{GS}=0V$	60			V
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 15V$			± 10	μA
Drain to Source Leakage Current	I_{DSS}	$V_{DS}=60V$ $V_{GS}=0V$			100	μA
Gate Threshold Voltage	V_{TH}	$V_{DS}=10V$, $I_D=1mA$	2.0	3.4	4.0	V
Forward Transconductance	$Re(yfs)$	$V_{DS}=10V$ $I_D=35A$	30	80		S
Static Drain to Source On-Resistance	$R_{DS(ON)}$	$I_D=35A$, $V_{GS}=10V$		5.0	6.0	m Ω
Input Capacitance	C_{iss}	$V_{DS}=10V$ $V_{GS}=0V$ $f=1MHz$		8400		pF
Output Capacitance	C_{oss}			1200		
Reverse Transfer Capacitance	C_{rss}			930		
Turn-On Delay Time	$t_{d(on)}$	$I_D=35A$ $V_{DD}=20V$ $R_G=22\Omega$ $R_{GS}=50\Omega$ $R_L=0.57\Omega$ $V_{GS}=10V$ See Fig.3		160		ns
Rise Time	t_r			170		
Turn-Off Delay Time	$t_{d(off)}$			430		
Fall Time	t_f			185		
Source-Drain Diode Forward Voltage	V_{SD}	$I_{SD}=50A$ $V_{GS}=0V$		0.9	1.5	V
Source-Drain Diode Reverse Recovery Time	t_{rr}	$I_{SD}=25A$ $di/dt=50A/\mu s$		65		ns
Thermal Resistance Junction to Case	$R_{th(ch-c)}$				1.25	$^{\circ}C/W$
Thermal Resistance Junction to Ambient	$R_{th(ch-a)}$				62.5	$^{\circ}C/W$

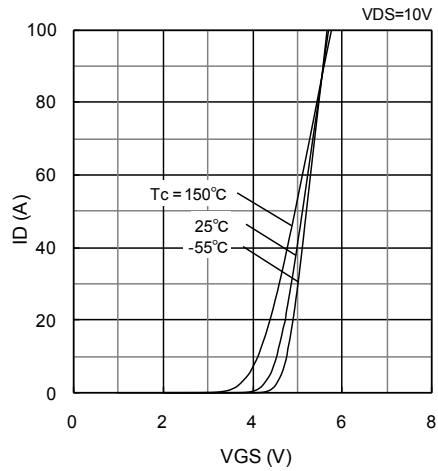
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Characteristic Curves (Tc=25°C)

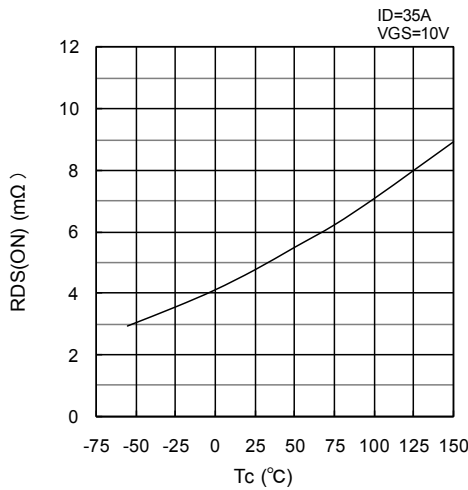
ID-VDS characteristics (typical)



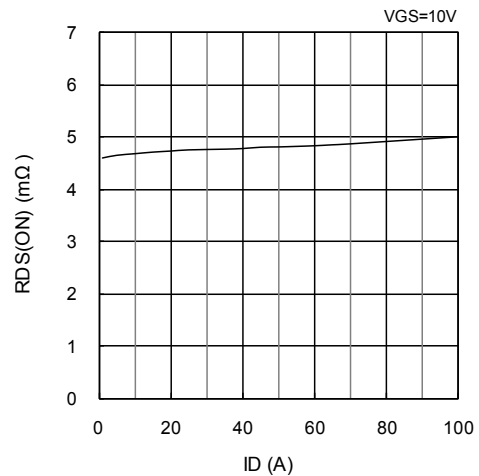
ID-VGS characteristics (typical)



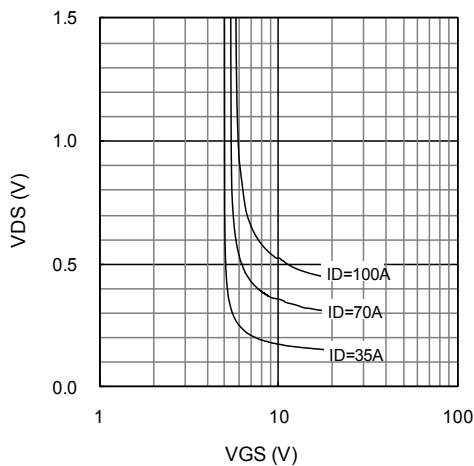
RDS(ON)-Tc characteristics (typical)



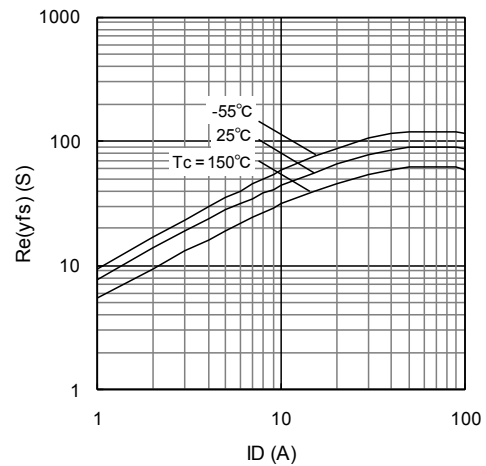
RDS(ON)-ID characteristics (typical)



VDS-VGS characteristics (typical)

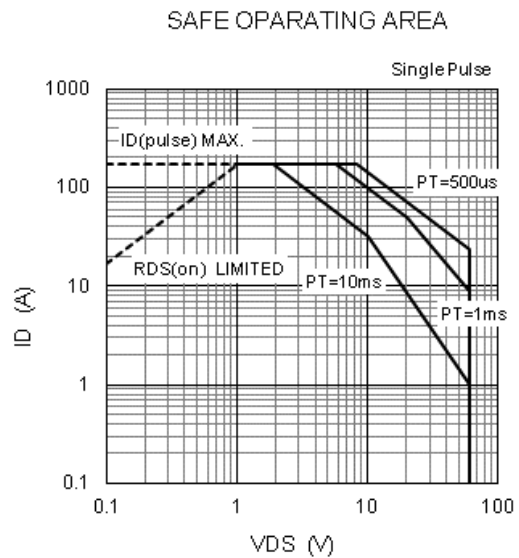
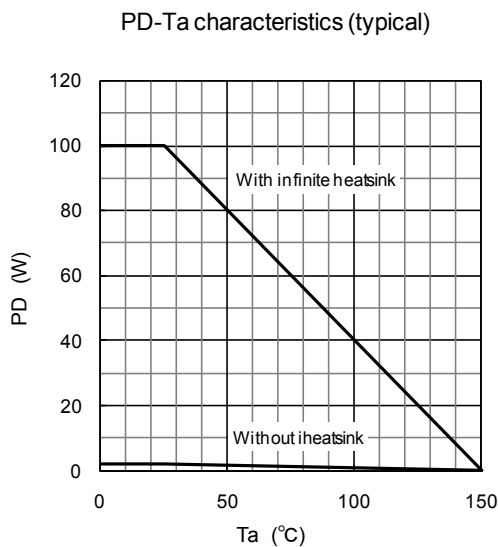
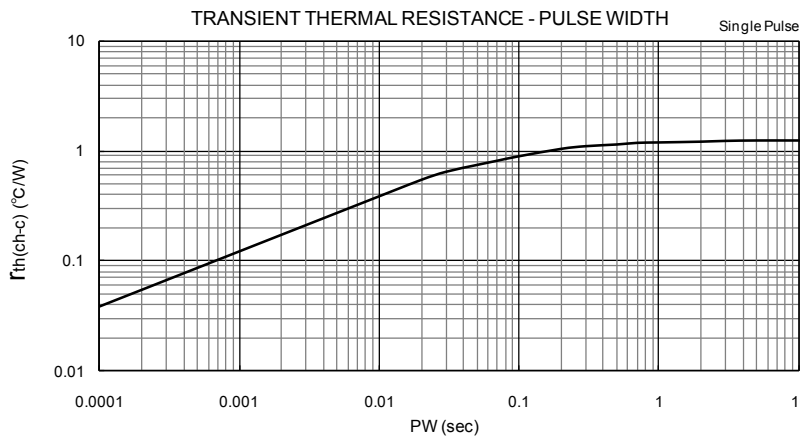
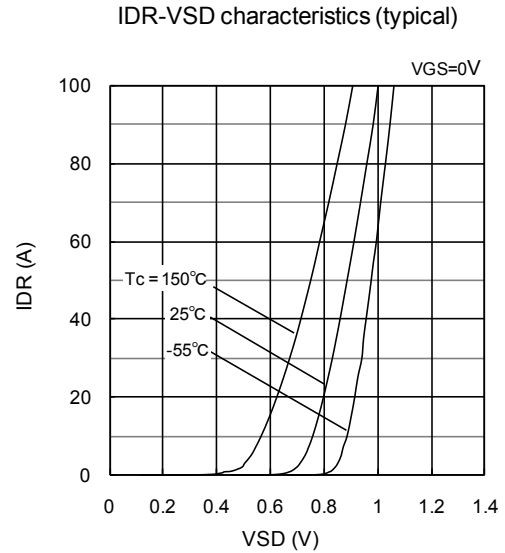
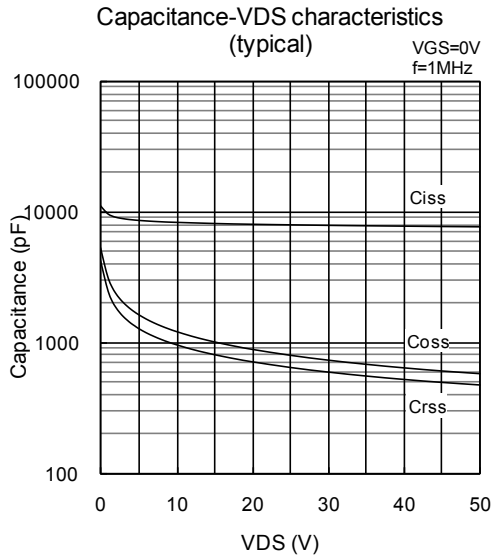


Re(yfs)-ID characteristics (typical)



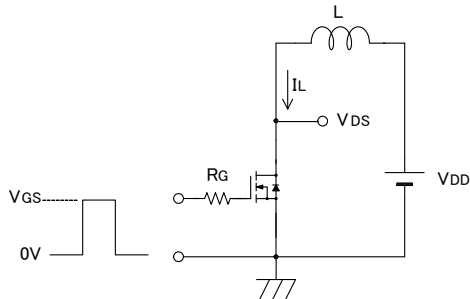
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Characteristic Curves (Tc=25°C)



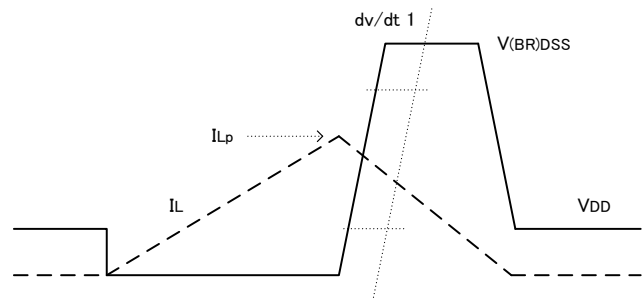
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Fig.1 Unclamped Inductive Test Method



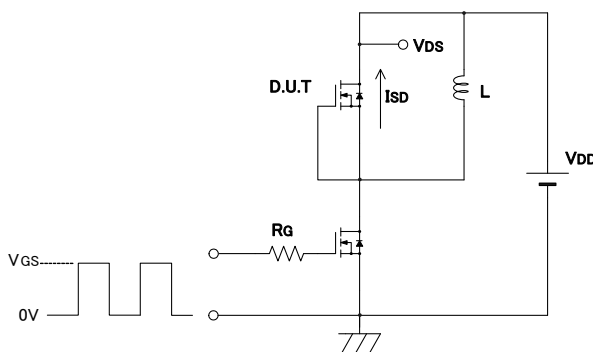
(a) Test Circuit

$$EAS = \frac{1}{2} \cdot L \cdot I_{LP}^2 \cdot \frac{V_{(BR)DSS}}{V_{(BR)DSS} - V_{DD}}$$

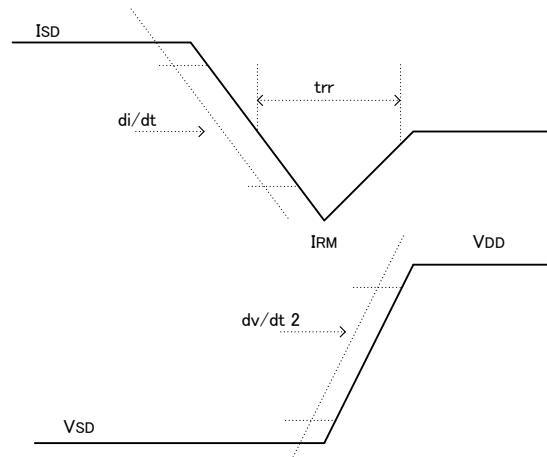


(b) Waveforms

Fig.2 Diode Reverse Recovery Time Test Method

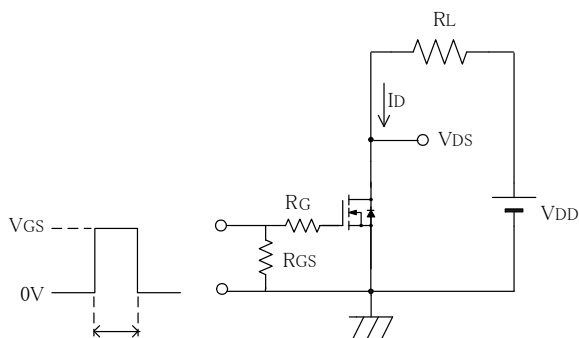


(a) Test Circuit

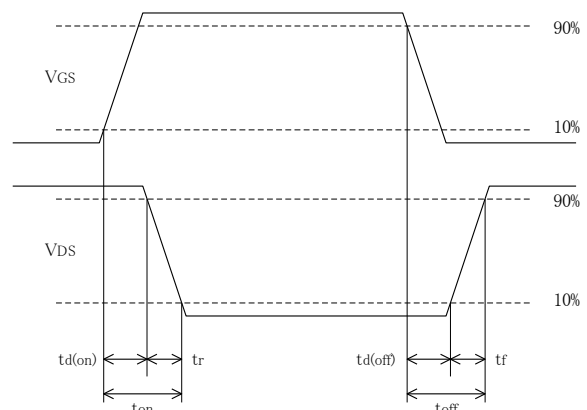


(b) Waveforms

Fig.3 Switching Time Test Method



(a) Test Circuit

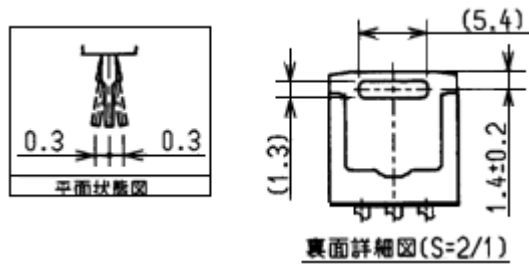
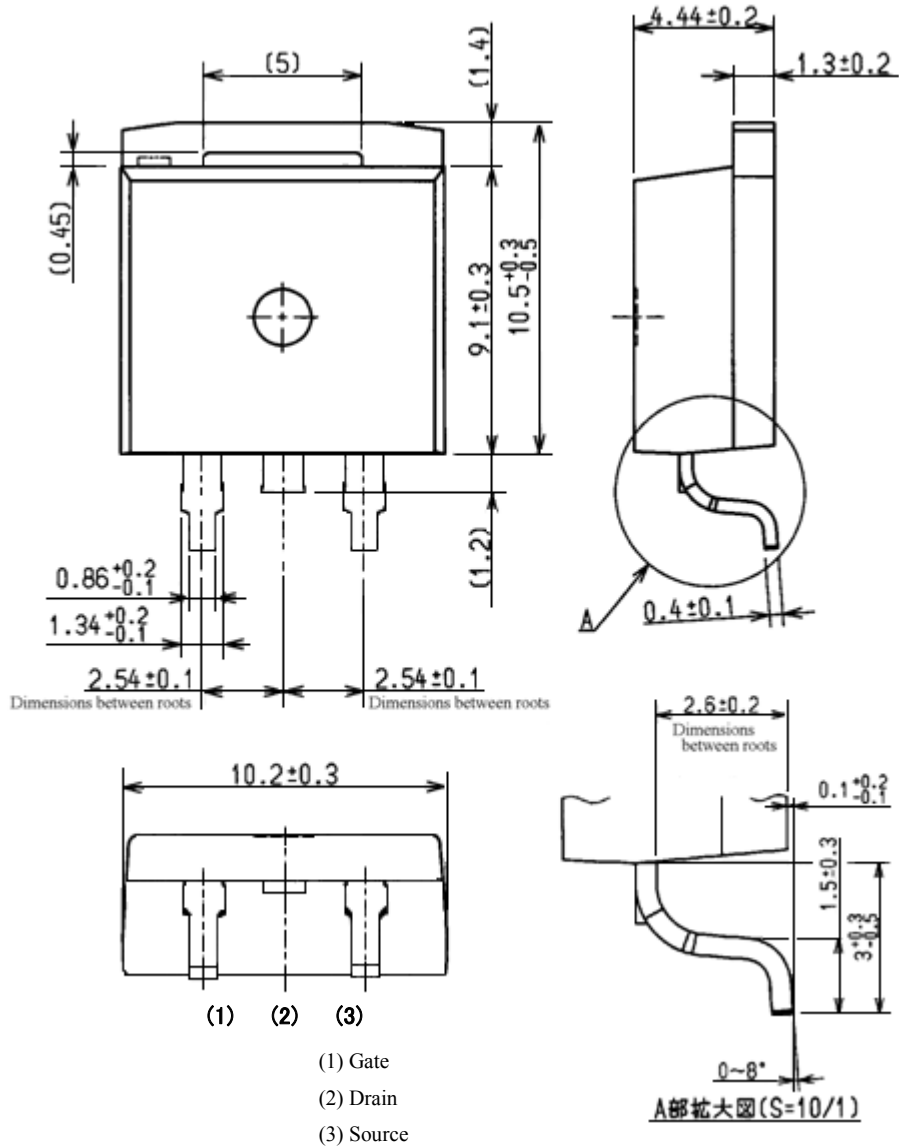


(b) Waveforms

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Outline

TO220S



Weight Approx. 1.4g

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