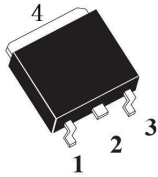


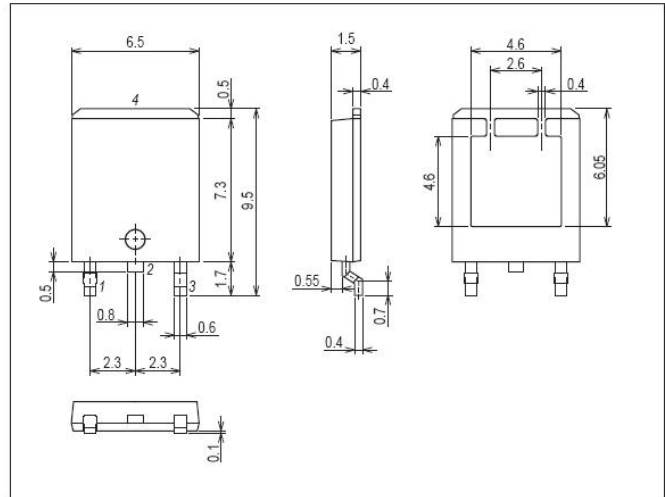
Features

- Low On resistance.
- 4.5V drive.
- RoHS compliant.



Package Dimensions

TO-252



Specifications

Absolute Maximum Ratings at $T_a=25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		30	V
Gate-to-Source Voltage	V_{GSS}		± 20	V
Drain Current (DC)	I_D		90	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{S}$, duty cycle $\leq 1\%$	360	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board ($1000\text{mm}^2 \times 0.8\text{mm}$) 1unit	65	W
Channel Temperature	T_{ch}		150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		$-55 \sim +170$	$^{\circ}\text{C}$

Electrical Characteristics at $T_a=25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	30	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40\text{V}$, $V_{GS}=0\text{V}$	-	-	1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	0.7	1.1	1.5	V
Static Drain-to-Source On-State Resistance	$R_{DS(ON)}$	$I_D=30\text{A}$, $V_{GS}=10\text{V}$	-	3	4	$\text{m}\Omega$
	$R_{DS(ON)}$	$I_D=20\text{A}$, $V_{GS}=4.5\text{V}$	-	4.7	6.6	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=15\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	-	1700	-	pF
Output Capacitance	C_{oss}		-	320	-	pF
Reverse Transfer Capacitance	C_{rss}		-	300	-	pF

SI3090L

Electrical Characteristics at $T_a=25^{\circ}\text{C}$ (Continued)

Parameter	Symbol	Conditions	Ratings			Unit
			min	Typ	max	
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=15\text{V}, I_D=30\text{A}, R_{GEN}=3\Omega,$ $V_{GS}=10\text{V}$	-	12	-	nS
Rise Time	t_r		-	16	-	nS
Turn-off Delay Time	$t_{d(off)}$		-	40	-	nS
Fall Time	t_f		-	11	-	nS
Total Gate Charge	Q_g	$V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=30\text{A}$	-	45	-	nC
Gate-to-Source Charge	Q_{gs}		-	3	-	nC
Gate-to-Drain "Miller" Charge	Q_{gd}		-	15	-	nC
Diode Forward Voltage	V_{SD}	$I_S=30\text{A}, V_{GS}=0\text{V}$	-	-	1.2	V

Test Circuit

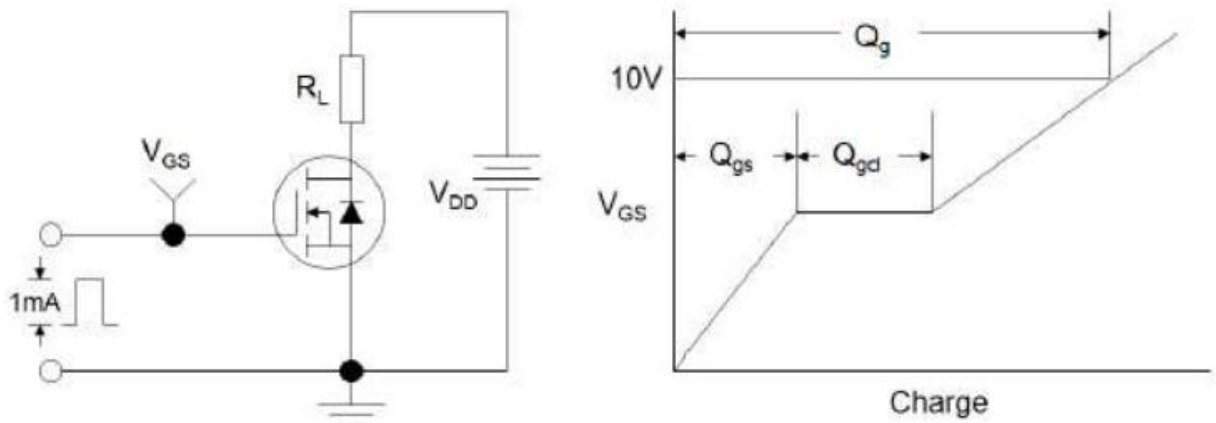


Figure 1: Gate Charge Test Circuit & Waveform

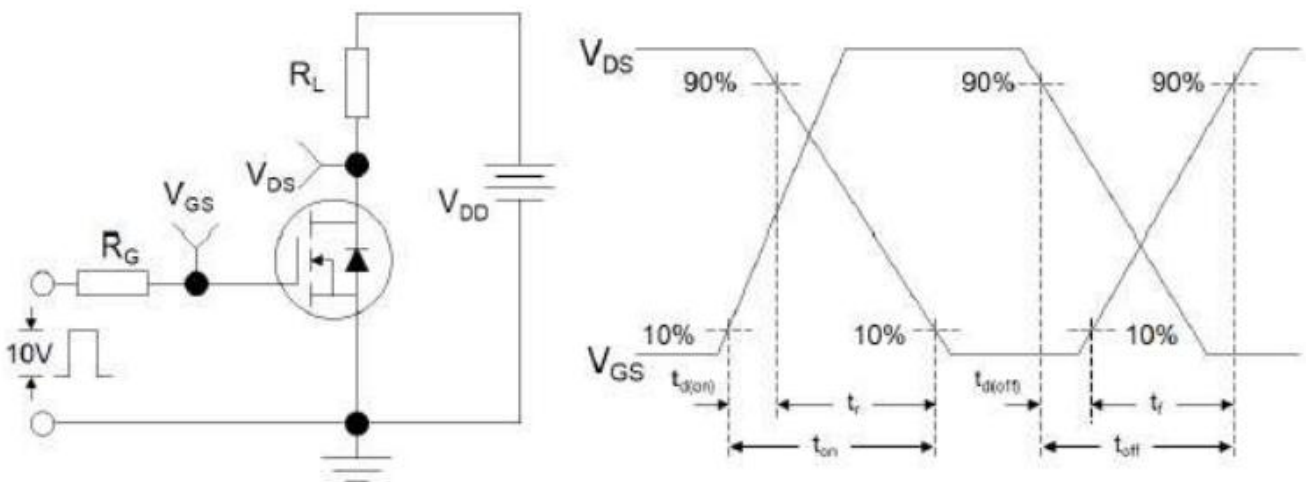


Figure 2: Resistive Switching Test Circuit & Waveforms

Typical Characteristics at $T_a=25^\circ\text{C}$

Figure 1: Output Characteristics

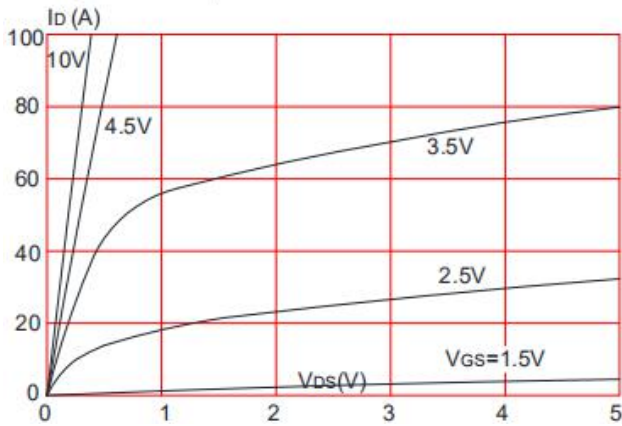


Figure 2: Typical Transfer Characteristics

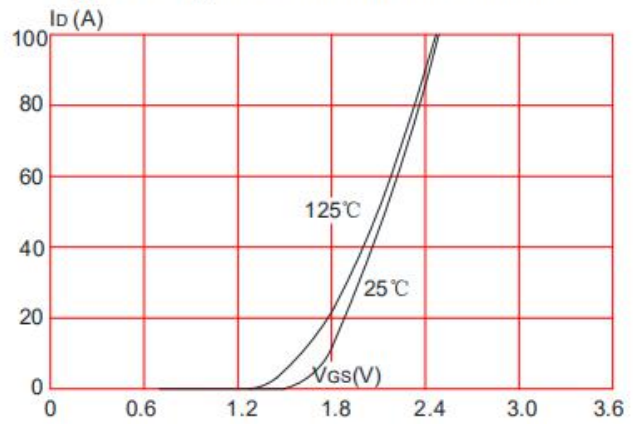


Figure 3: On-resistance vs. Drain Current

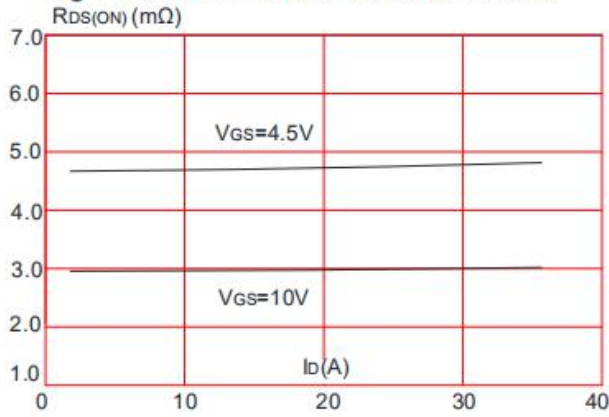


Figure 4: Body Diode Characteristics

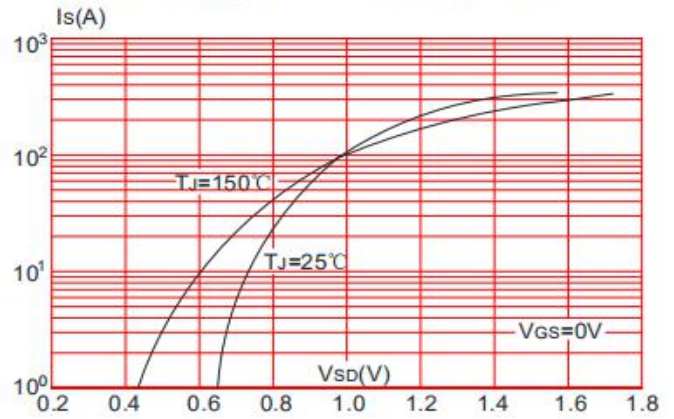


Figure 5: Gate Charge Characteristics

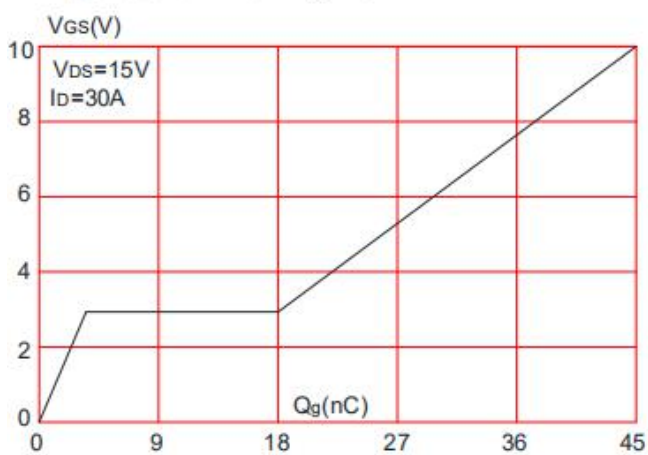
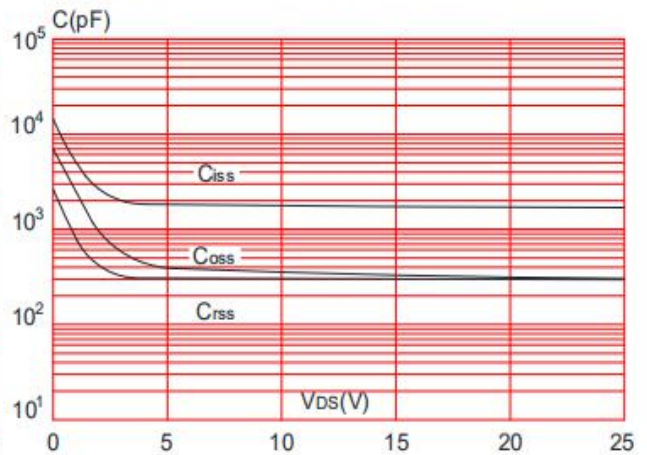


Figure 6: Capacitance Characteristics



Typical Characteristics at $T_a=25^{\circ}\text{C}$ (Continued)

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

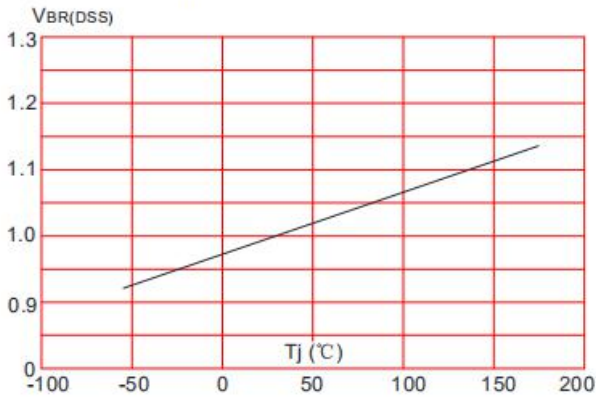


Figure 8: Normalized on Resistance vs. Junction Temperature

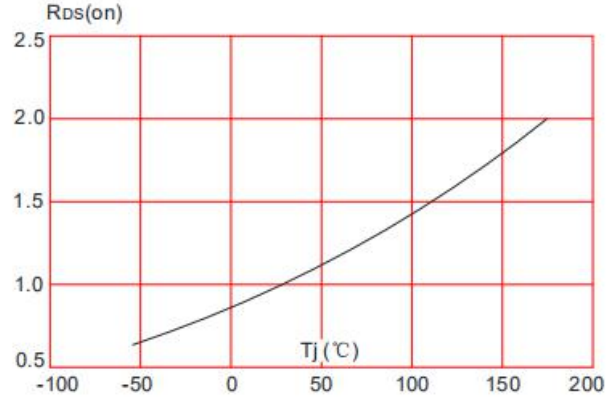


Figure 9: Maximum Safe Operating Area

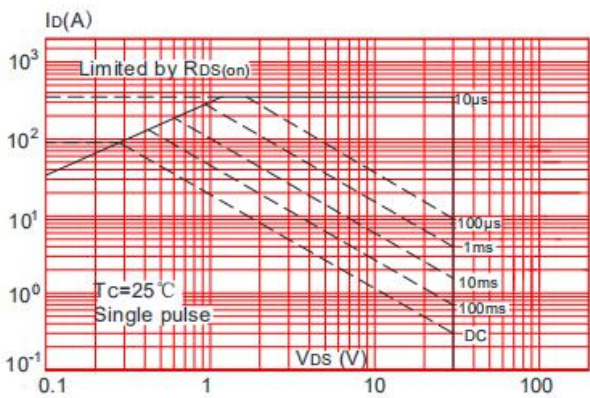


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

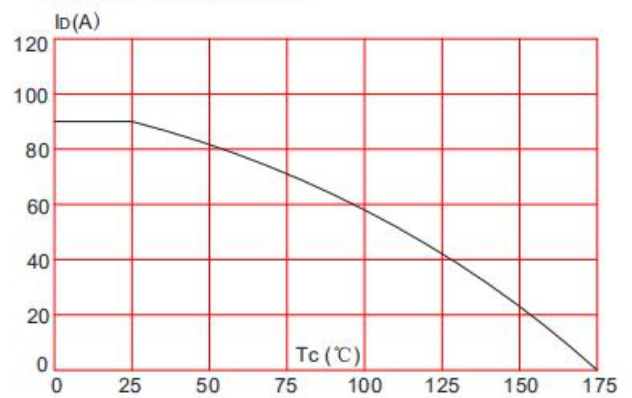


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

