

P-Channel Enhancement Mode Field Effect Transistor

● Features

$V_{DS} (V) = -20V, I_D = -4A$

$R_{DS(ON)} < 55m\Omega @ V_{GS} = -4.5V$

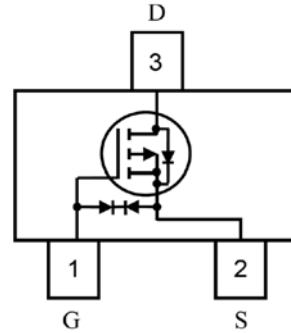
$R_{DS(ON)} < 63m\Omega @ V_{GS} = -2.5V$

$R_{DS(ON)} < 83m\Omega @ V_{GS} = -1.8V$

SOT23-3L Package

ESD Protected: 3000V HBM

● Pin Configurations



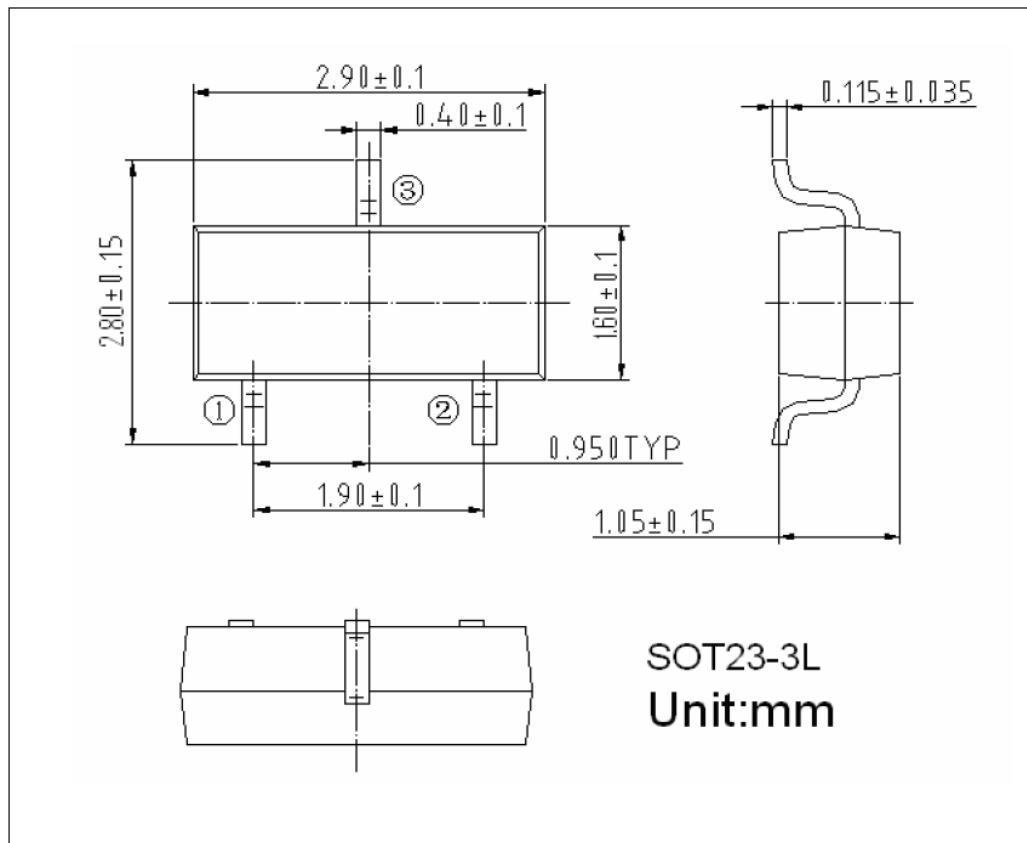
● General Description

The RCR1540ESJ uses advanced trench technology to provide excellent

$R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V.

This device is suitable for use as a load switch or in PWM applications.

● Package Information



● Absolute Maximum Ratings @ $T_A = 25^\circ C$ unless otherwise noted

Parameter Sy	mbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V

**RCR15****40ESJ**

Drain Current (Continuous)	T _A =25°C	I _D	-4	A
	T _A =70°C		-3.2	
Drain Current (Pulse)		I _{DM}	-30	A
Power Dissipation	T _A =25°C	P _D	1.4	W
Operating Temperature/ Storage Temperature		T _J /T _{STG}	-55~150	°C

● **Electrical Characteristics @T_A=25°C unless otherwise noted**

Parameter	Symbol Test	Conditions Min		Typ	Max	Unit
ON/OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-20	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -16 V , V _{GS} = 0V	--	--	-1	μA
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _{DS} =-250μA	-0.3	-0.65	-1	V
Gate Leakage Current	I _{GSS}	V _{GS} =±8V , V _{DS} =0V	--	--	±10	μA
Drain-Source On-state Resistance	R _{DS(on)}	V _{GS} = -4.5V , I _D = -4A	--	50	55	mΩ
		V _{GS} = -2.5V , I _D = -4A	--	59	63	mΩ
		V _{GS} = -1.8V , I _D = -2A	--	74	83	mΩ
Forward Transconductance	g _{FS}	V _{DS} = -5V , I _D = -4A	8	16	--	S
Diode Forward Voltage	V _{SD}	I _{SD} = -1A , V _{GS} = 0V	--	-0.81	-1.0	V
Maximum Body-Diode Continuous Current	I _S		-- --		-2.2	A
Switching CHARACTERISTICS						
Total Gate Charge	Q _g	V _{DS} = -10V, I _D = -4A V _{GS} = -4.5V	--	4.59	5.97	nC
Gate-Source Charge	Q _{gs}		--	2.14	2.78	nC
Gate-Drain Charge	Q _{gd}		-- 2.51		3.26	nC
Turn-on Delay Time	t _{d (on)}	V _{DD} = -10V, R _L =2.5 Ω I _D = -4A, V _{GEN} = -4.5V R _G = 3 Ω	--	965.2	1930.4	ns
Turn-on Rise Time	t _r		--	1604	3208	ns
Turn-off Delay Time	t _{d(off)}		--	7716	15432	ns
Turn-off Fall Time	t _f		-- 3452		6904	ns
Dynamic CHARACTERISTICS						
Input Capacitance	C _{iss}	V _{GS} =0V,V _{DS} = -10V f= 1.0MHz	--	36.45	--	pF
Output Capacitance	C _{oss}		--	128.57	--	pF
Reverse Transfer Capacitance	C _{rss}		-- 15.17		--	pF

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test: PW ≤ 300μs, duty cycle ≤ 2%.
3. For design AID only, not subject to production testing.
4. Switching time is essentially independent of operating temperature.

● **Typical Performance Characteristics**

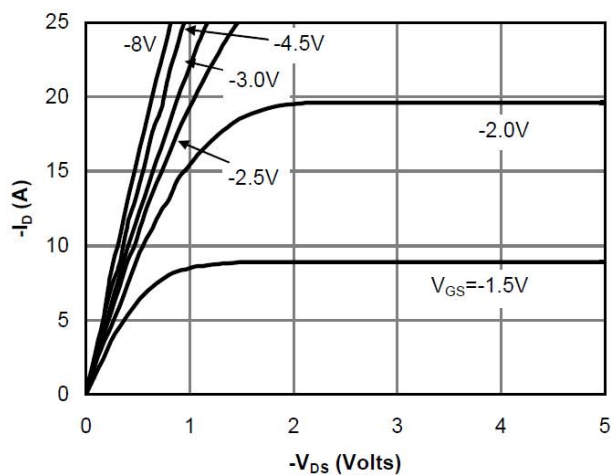


Fig 1: On-Region Characteristics

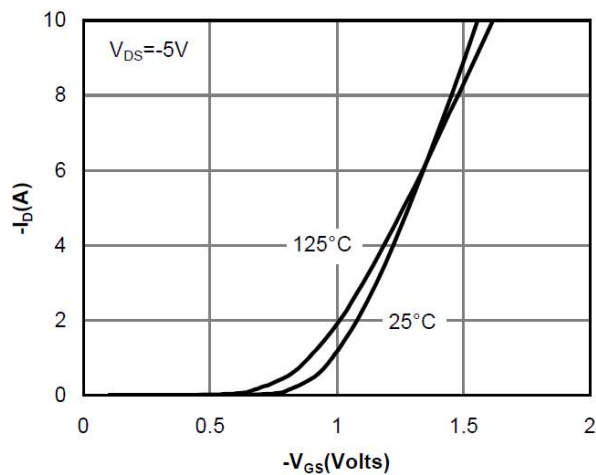


Figure 2: Transfer Characteristics

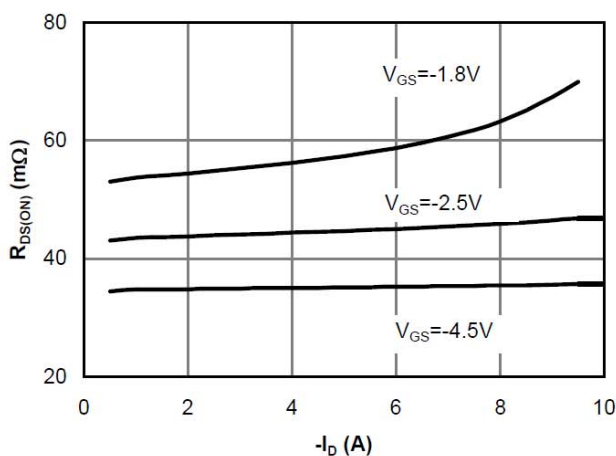


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

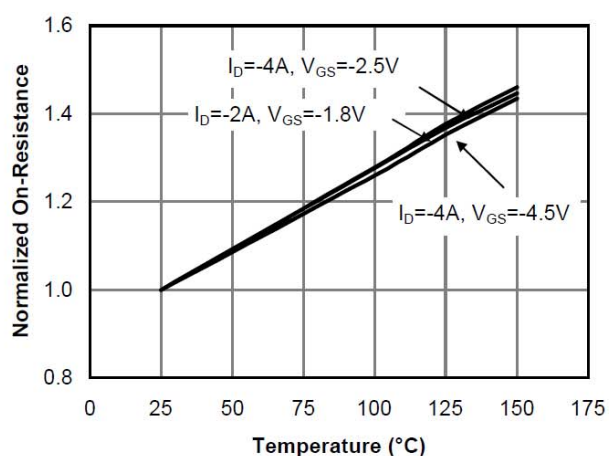


Figure 4: On-Resistance vs. Junction Temperature

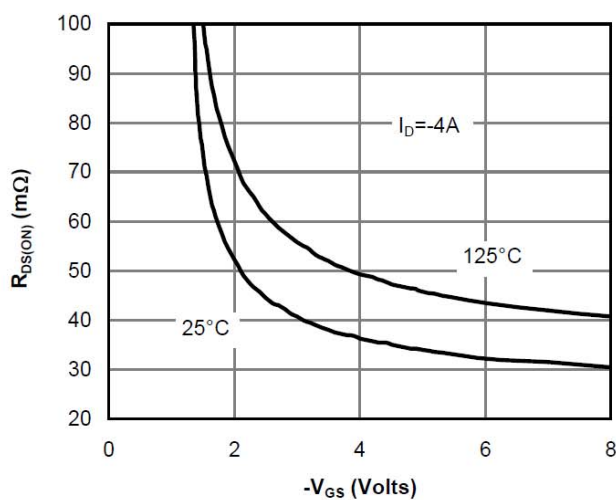


Figure 5: On-Resistance vs. Gate-Source Voltage

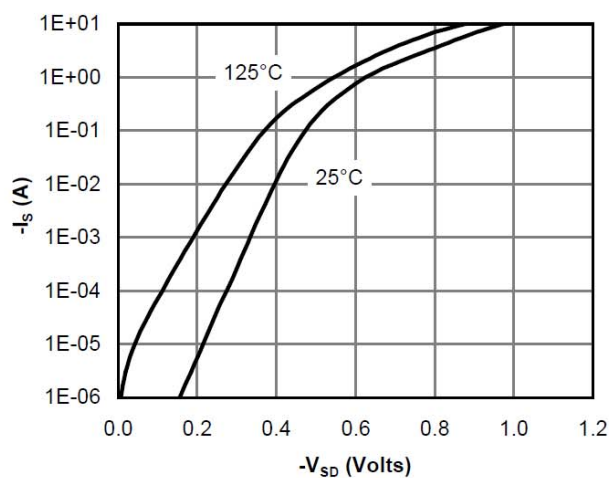


Figure 6: Body-Diode Characteristics

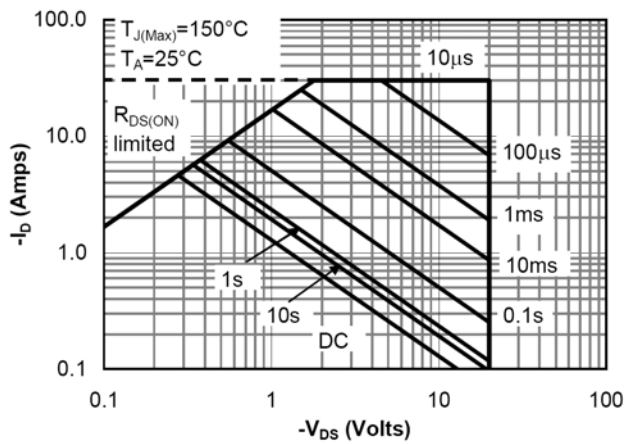


Figure 7: Maximum Forward Biased Safe Operating Area

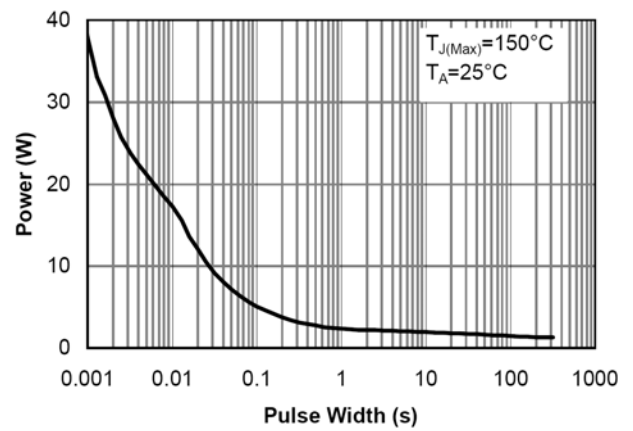


Figure 8: Single Pulse Power Rating Junction-to-Ambient

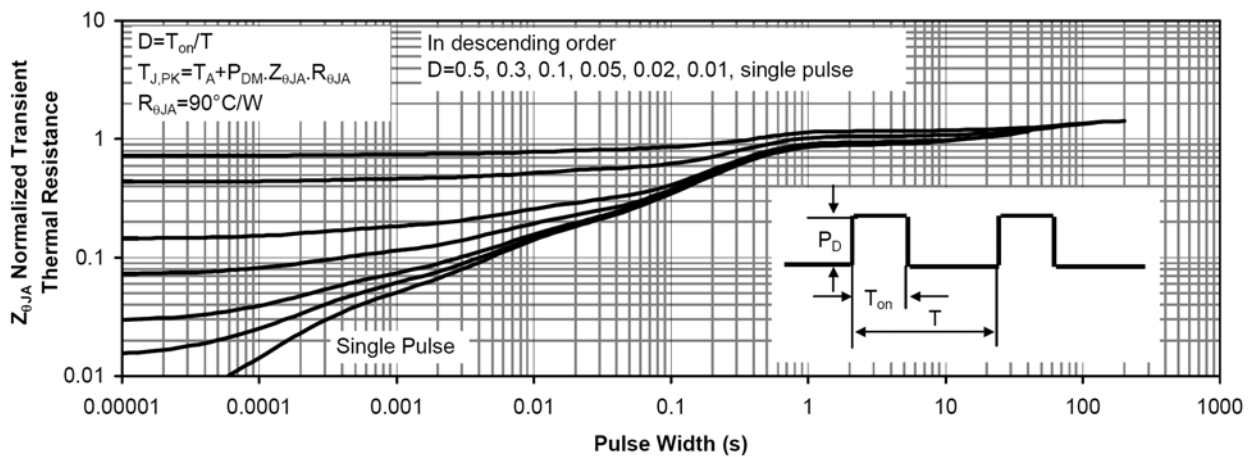


Figure 9: Normalized Maximum Transient Thermal Impedance



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