

/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol		Rating		Unit
			N-channel	P-channel	
Drain-Source Voltage	V _{DSS}		60	-60	V
Gate-Source Voltage	V _{GSS}		±20		V
Continuous Drain Current	I _D (T _A =25 °C)		9.7	-3.4	A
Pulsed Drain Current	I _{DM}		±40		A
Power Dissipation	P _D (T _A =25°C)		2.7	1.9	W
Maximum Junction-to-Ambient	R _{θJA}	t≤10s	46.3	65.8	°C/W
		Steady-State	72	100	°C/W
Junction and Storage Temperature Range	T _J , T _{STG}		-55 to +150		°C

BRCS4612SCQ

Rev.A Aug.-2024

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$	$I_D=250\mu A$	60	68		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V$	$V_{GS}=0V$			1.0	μA
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 20V$	$V_{DS}=0V$			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$	$I_D=250\mu A$	1.0	1.7	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$	$I_D=10A$		14	16	m Ω
		$V_{GS}=4.5V$	$I_D=10A$		17.5	22	m Ω
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$	$I_S=1.0A$			1.2	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $f=1.0MHz$	$V_{GS}=0V$		570		pF
Output Capacitance	C_{oss}				310		pF
Reverse Transfer Capacitance	C_{rss}				11		pF
Gate resistance	R_g	$V_{DS}=0V$ $f=1.0MHz$	$V_{GS}=0V$		1.5		Ω
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10V$ $I_D=9.7A$	$V_{DS}=30V$		13.5		nC
Total Gate Charge	$Q_{g(4.5V)}$				6.5		nC
Gate-Source Charge	Q_{gs}				2.5		nC

N- / N-CHANNEL Electrical Characteristic Curve

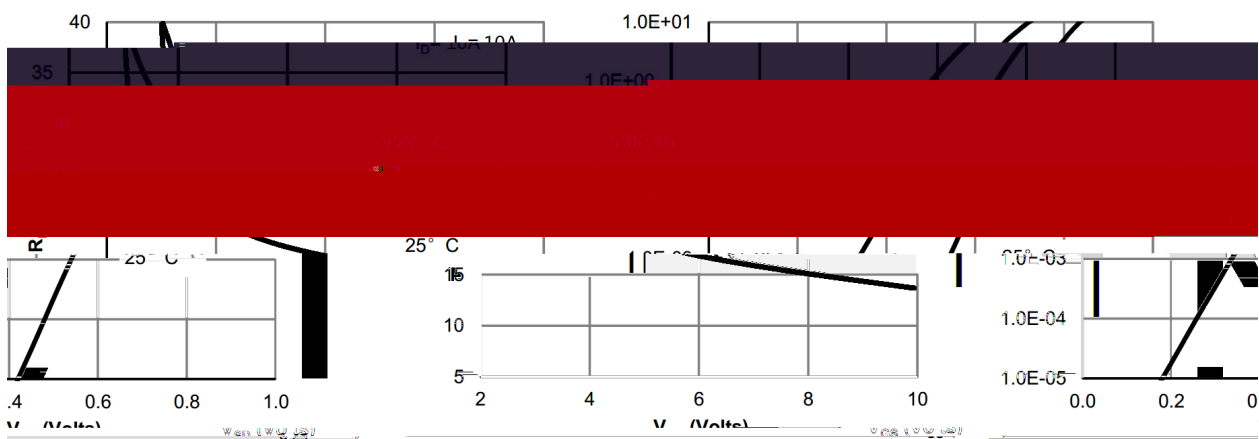
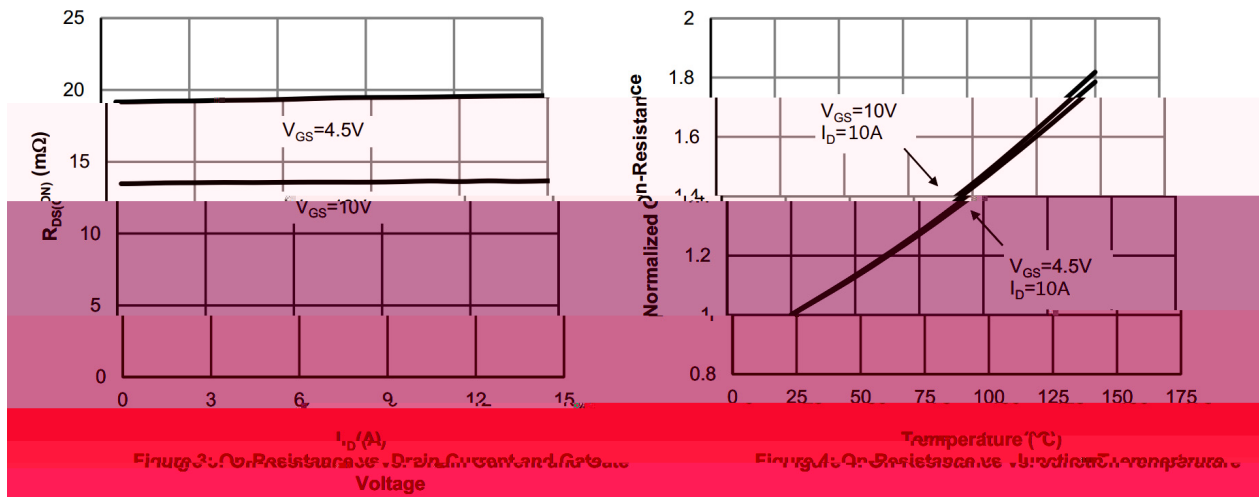
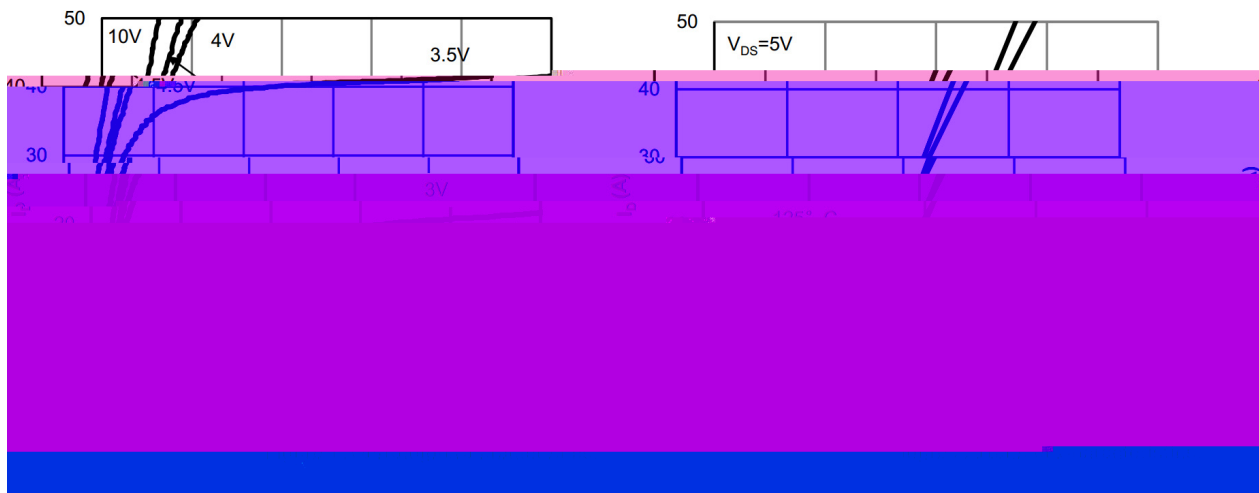


Figure 6: Body-Diode Characteristics

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

N- / N-CHANNEL Electrical Characteristic Curve

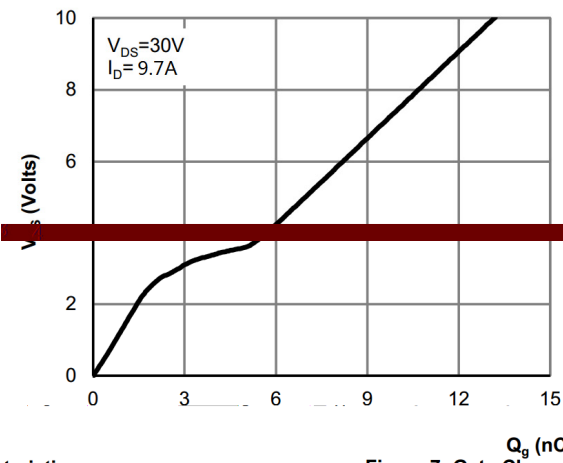


Figure 7: Gate-Charge Characteristics

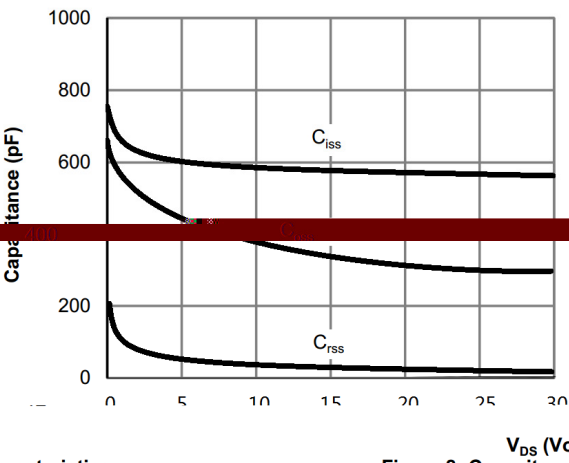


Figure 8: Capacitance Characteristics

P- /P-CHANNEL Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-60	-71		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-60V$ $V_{GS}=0V$			-1.0	μA
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-1.0	-1.7	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V$ $I_D=-10A$		87	100	m Ω
		$V_{GS}=-4.5V$ $I_D=-10A$		104	130	m Ω
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=-1.0A$			-1.0	V
Input Capacitance	C_{iss}	$V_{DS}=-25V$ $V_{GS}=0V$ $f=1.0MHz$		1170		pF
Output Capacitance	C_{oss}			60		pF
Reverse Transfer Capacitance	C_{rss}			45		pF
Gate resistance	R_g	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$		5.5		Ω
Total Gate Charge	$Q_{g(-10V)}$	$V_{GS}=-10V$ $V_{DS}=-30V$ $I_D=-3.4A$		12.3		nC
Total Gate Charge	$Q_{g(-4.5V)}$			6.3		nC
Gate-Source Charge	Q_{gs}			1.6		nC
Gate-Drain Charge	Q_{gd}			2.4		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-30V$ $V_{GS}=-10V$ $R_L=5.4\Omega$ $R_{GEN}=3\Omega$		12		ns
Turn-On Rise Time	t_r			20		ns
Turn-Off Delay Time	$t_{d(off)}$			20		ns
Turn-Off Fall Time	t_f			25		ns

P- / P-CHANNEL Electrical Characteristic Curve

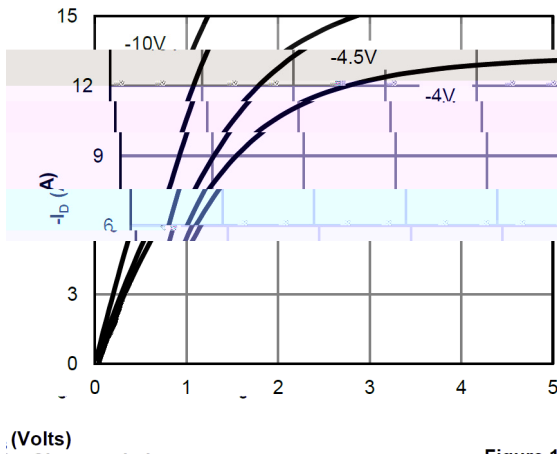


Figure 1: On-Region Characteristics

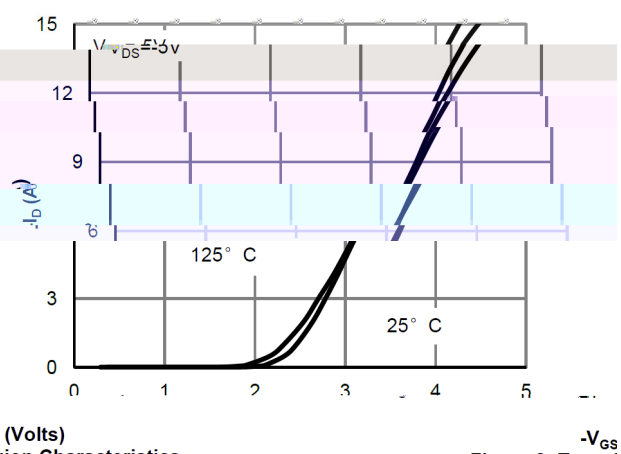


Figure 2: Transf

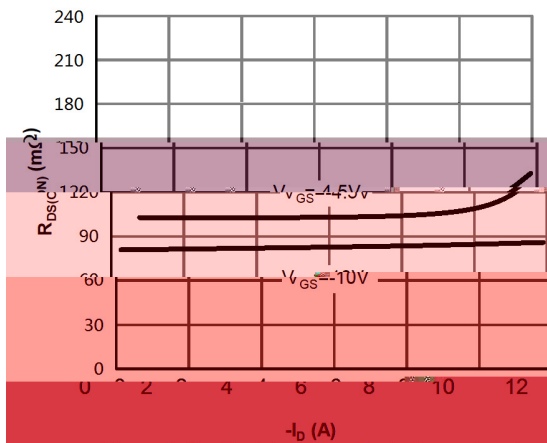


Figure 3: On-Resistance vs. Drain Current

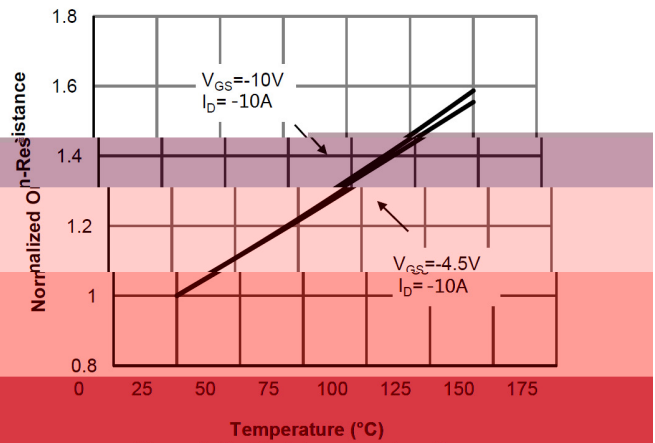


Figure 4: On-Resistance vs. Temperature

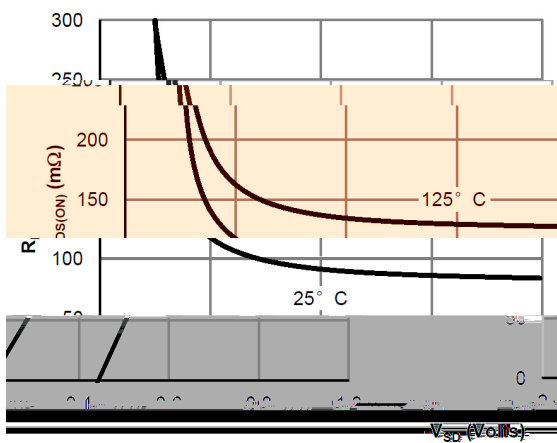


Figure 6: Body-Diode Characteristics

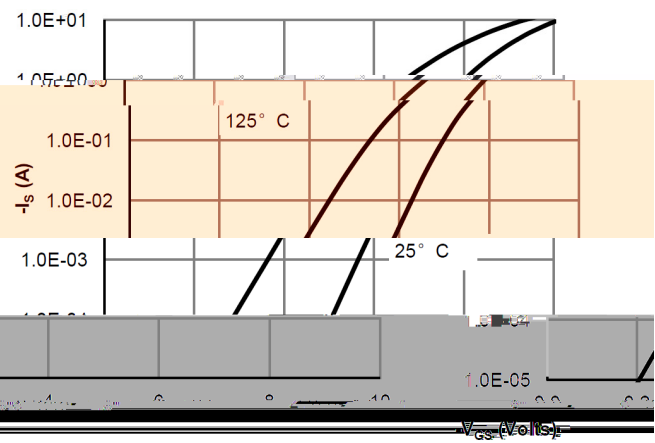
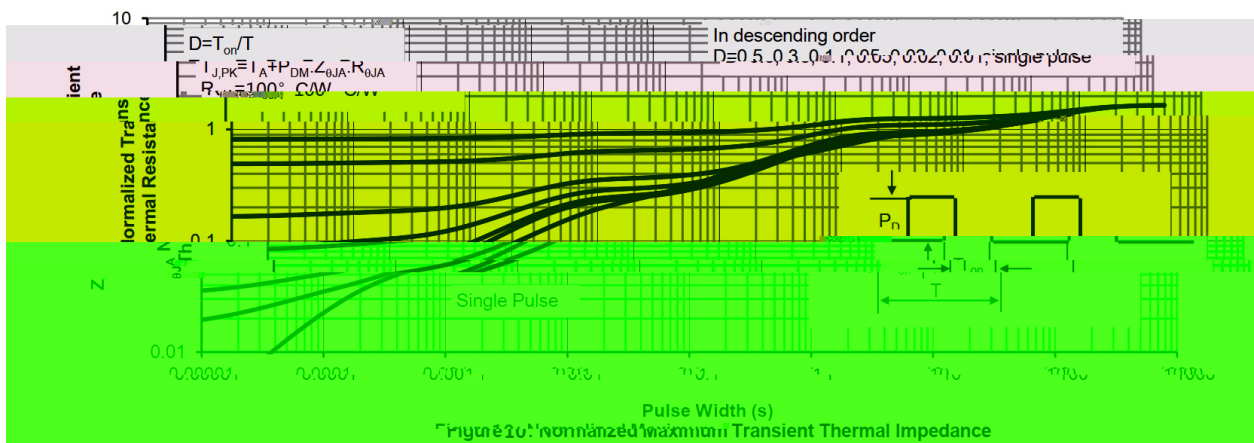
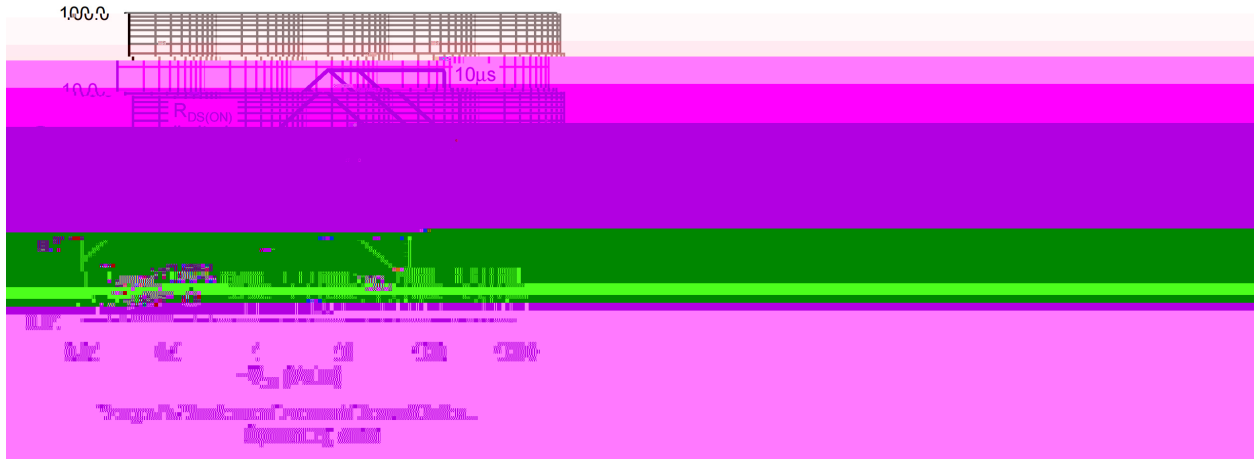
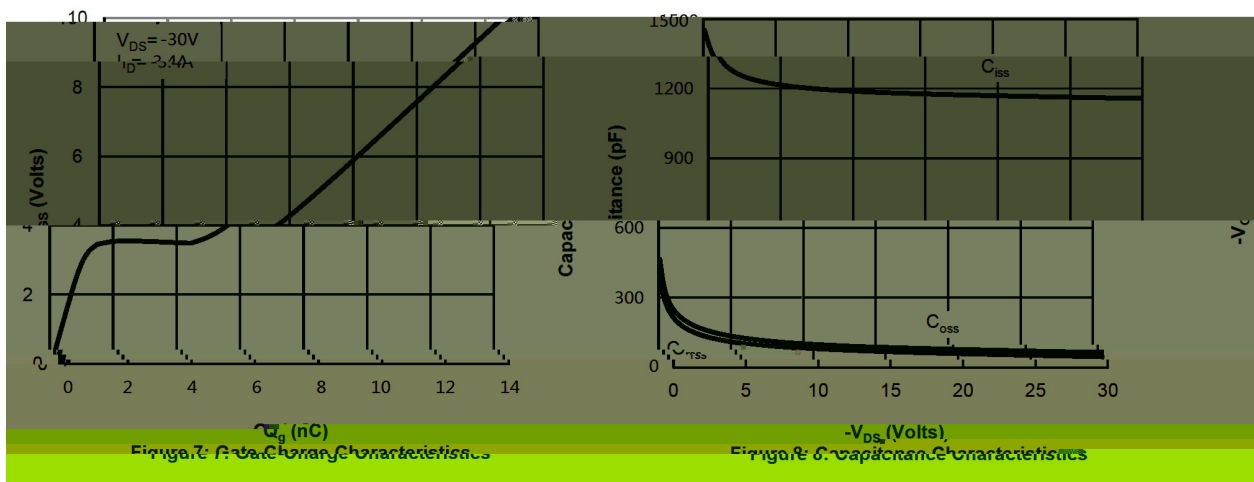
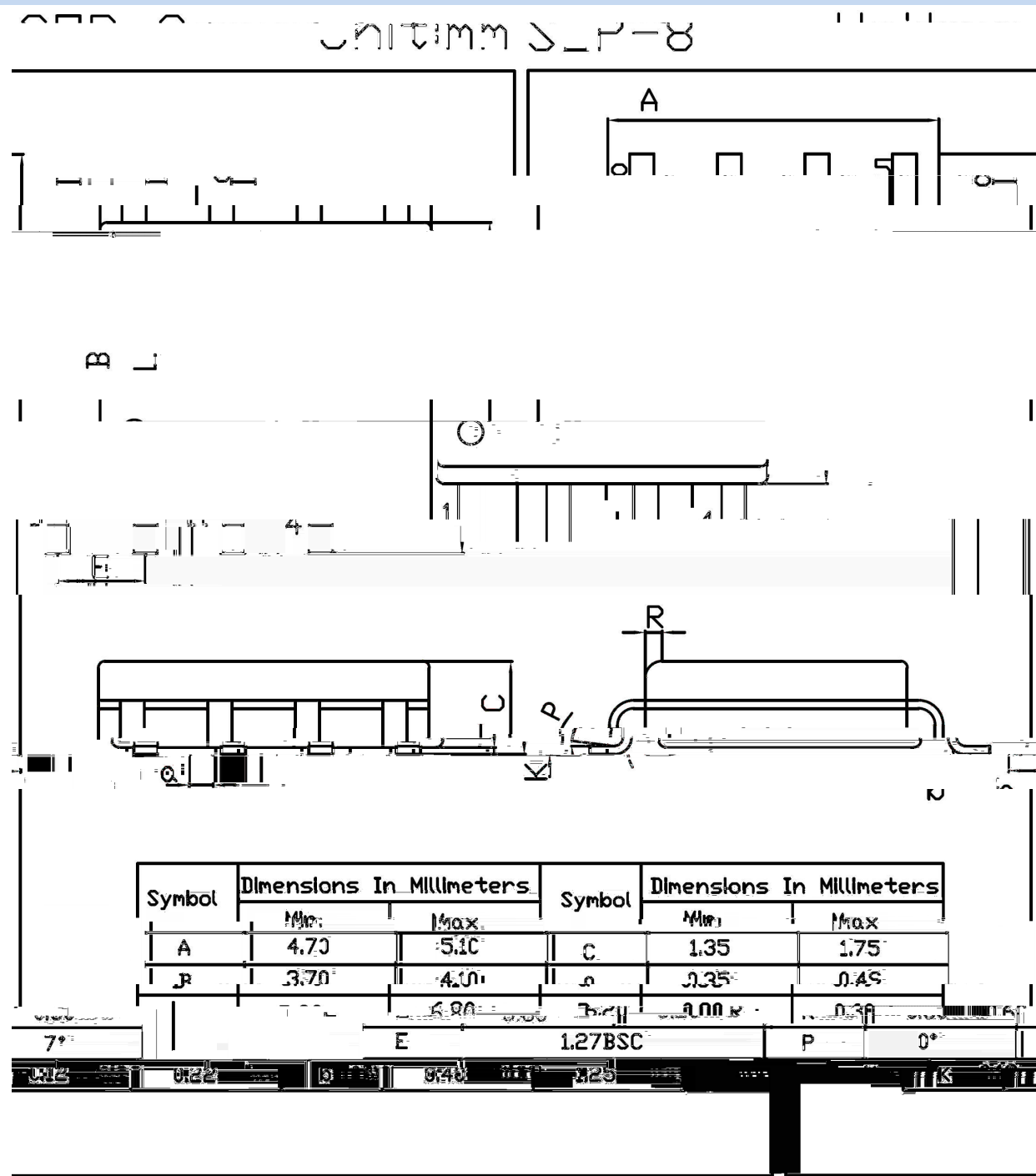


Figure 5: On-Resistance vs. Gate-Source

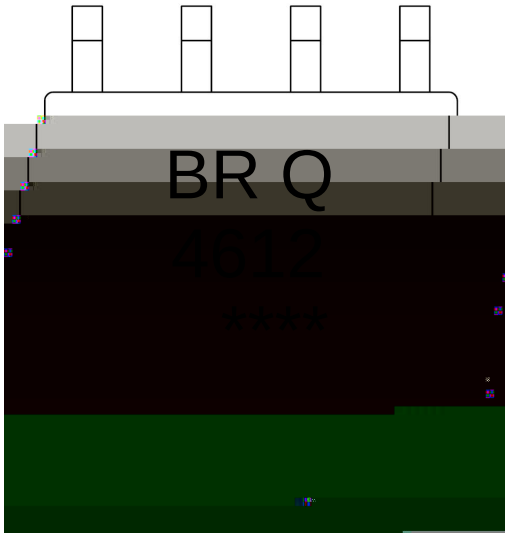
P- / P-CHANNEL Electrical Characteristic Curve



/ Package Dimensions



/ Marking Instructions



BR

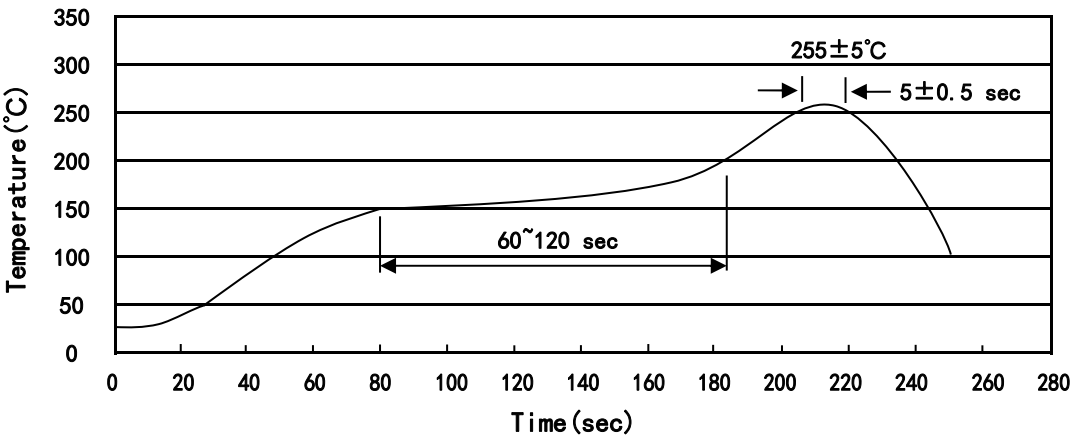
Q

4612

Note:

- | | |
|-------|---------------------------------------|
| BR: | Company Code |
| Q: | Automobile halogen-free product Code |
| 4612: | Product Type Code |
| ****: | Lot No. Code, code change with Lot No |

() / Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

- 1

150 200

60 120sec;

1.Preheating:150~200 , Time:60~120sec.
- 2

255±5

5±0.5sec;

2.Peak Temp.:255±5 , Duration:5±0.5sec.
- 3

2 10 /sec.

3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

260±5 10±1 sec. Temp.:260±5℃ Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm³)		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
SOP/ESOP-8	4,000	2	8,000	6	48,000	13 ×12	360×360×50	380×335×366

/ Notices