

BRCS060N04DP

Rev.A Aug.-2023

/ Descriptions

TO-252 N

N-CHANNEL MOSFET in a TO-252 Plastic Package.

/ Features

$V_{DS}(V)=40V$ $I_D=70A$

$R_{DS(ON)}@10V<6m\Omega$ (Typ. 5.6mR)

$R_{DS(ON)}@4.5V<12m\Omega$ (Typ. 10.8mR)

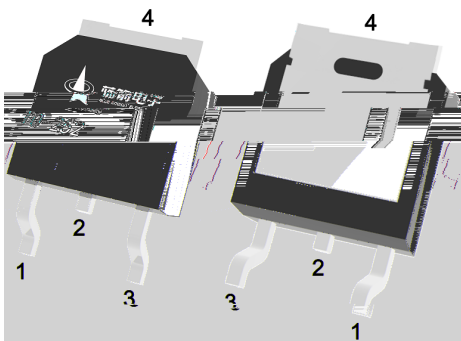
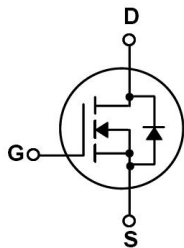
HF Product.

/ Applications

DC/DC

Suited for low voltage applications such as automotive, DC/DC Converters, and high efficiency switching for power management in portable and battery operated products, Meet the stringent requirements of automotive applications.

/ Equivalent Circui



PIN1 G

PIN 2 D

PIN 3 S

PIN 4 D

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings(Ta=25)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	40	V
Drain Current		$I_D(T_c=25^{\circ}\text{C})$	70	A
Drain Current - Pulsed		I_{DM}	159	A
Gate-Source Voltage		V_{GS}	± 20	V
Avalanche Current		I_{AS}	24.5	A
Single Pulsed Avalanche Energy(L=0.5mH)		E_{AS}	192	mJ
Power Dissipation		$P_D(T_c=25^{\circ}\text{C})$	50	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	
Thermal Resistance-Junction to Ambient	$t \leq 10s$	$R_{\theta JA}$	20	$^{\circ}\text{C/W}$
	Steady-State		50	
Thermal Resistance-Junction to Case	Steady-State	$R_{\theta JC}$	2.5	

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS}=0V$ $I_D=250\mu A$	40	46		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V$ $V_{GS}=0V$			1.0	μA
Gate-Body Leakage Current Forward	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	1.6	3.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=20A$		5.6	6	m Ω
		$V_{GS}=4.5V$ $I_D=10A$		8.6	12	
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=1A$			1.4	V
Gate resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$, $f=1MHz$		2.1		Ω
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		2200		pF
Output Capacitance	C_{oss}			265		
Reverse Transfer Capacitance	C_{rss}			145		
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10V$, $V_{DS}=20V$, $I_D=20A$		22		nC
Total Gate Charge	$Q_{g(4.5V)}$			8.9		
Gate Source Charge	Q_{gs}			5.7		
Gate Drain Charge	Q_{gd}			3.1		

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=20V$ $R_L=1.0\ \Omega$ $R_{GEN}=3\ \Omega$		7.8		ns
Turn-On Rise Time	t_r			2.1		
Turn-Off Delay Time	$t_{d(off)}$			25		
Turn-Off Fall Time	t_f			3.2		

/ Electrical Characteristic Curve

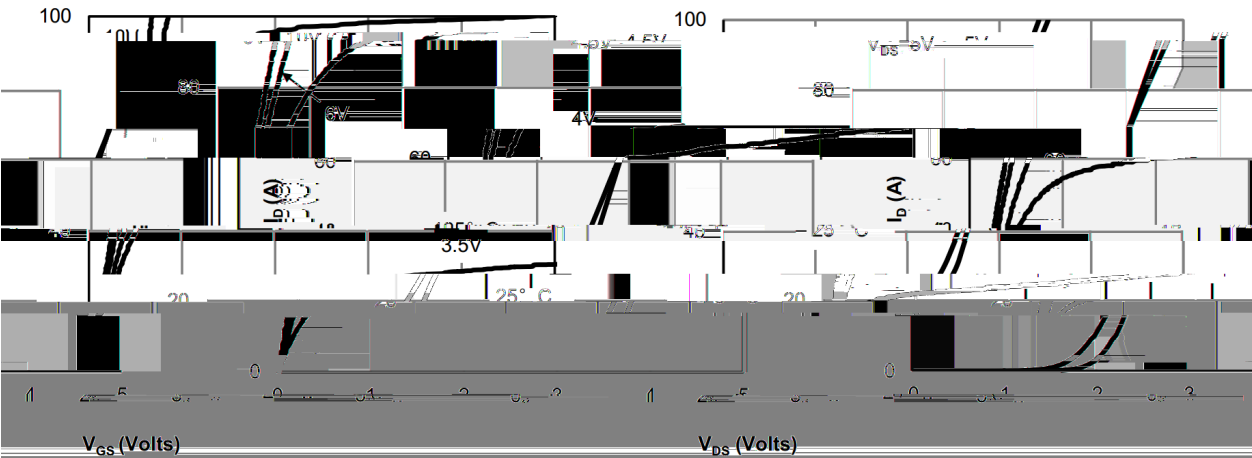
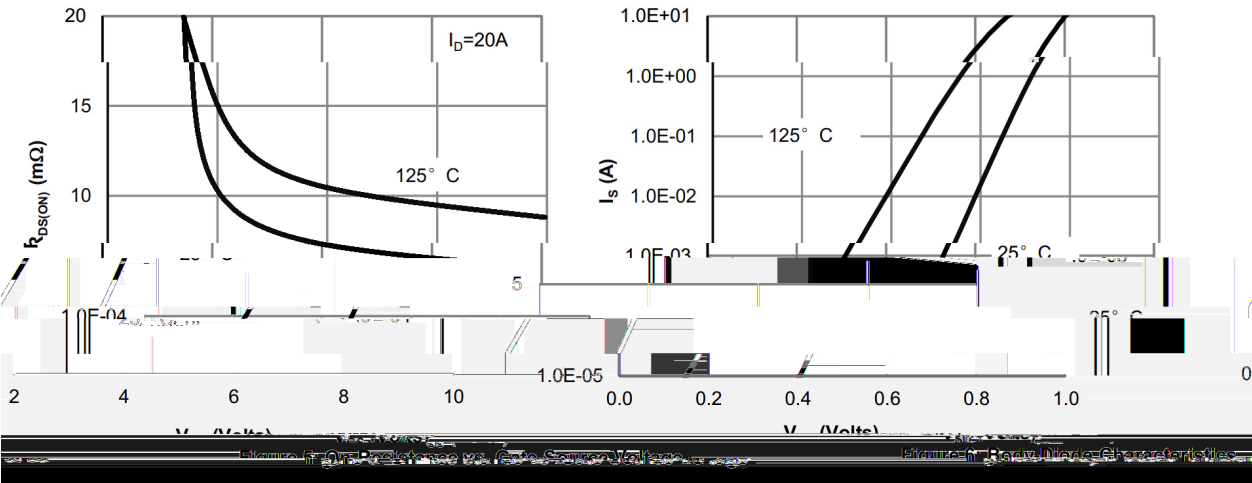
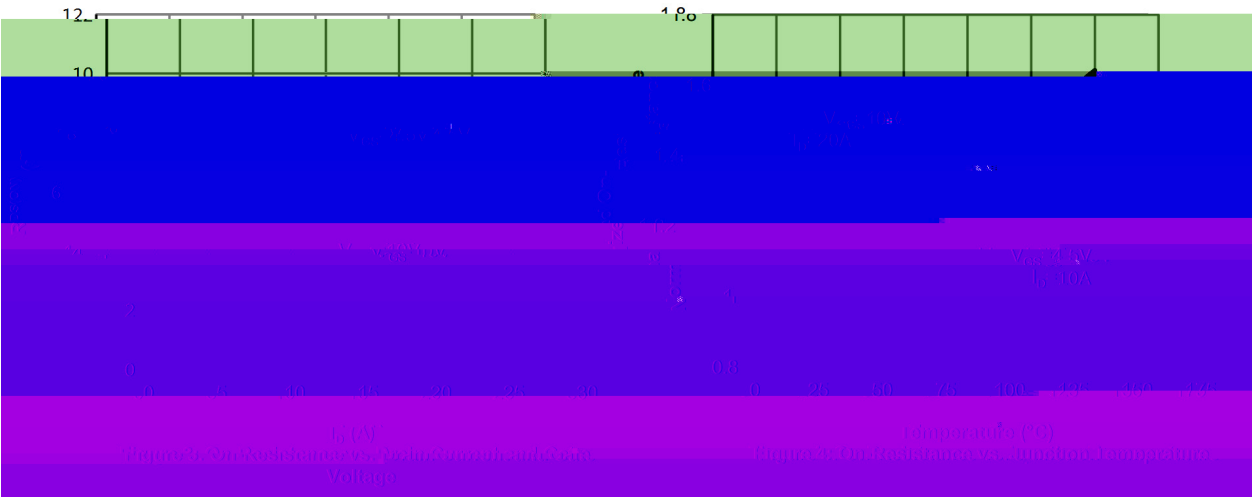


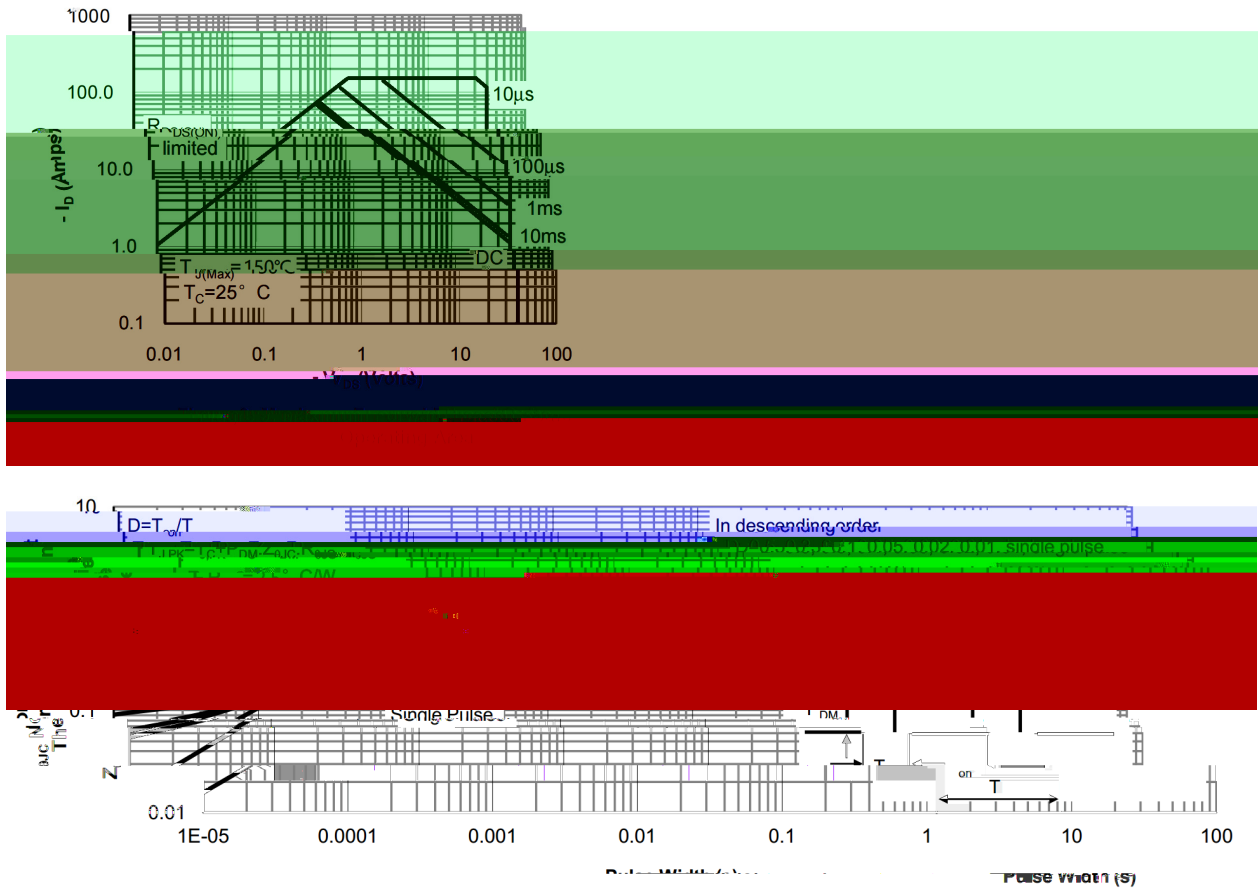
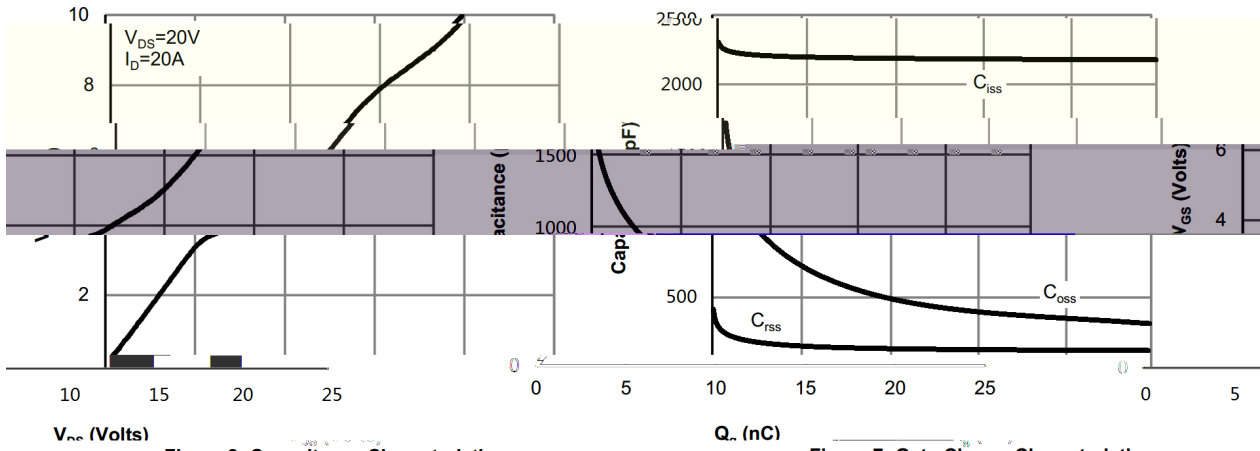
Figure 2: Transfer Characteristics

Figure 1: On-Region Characteristics

Fig



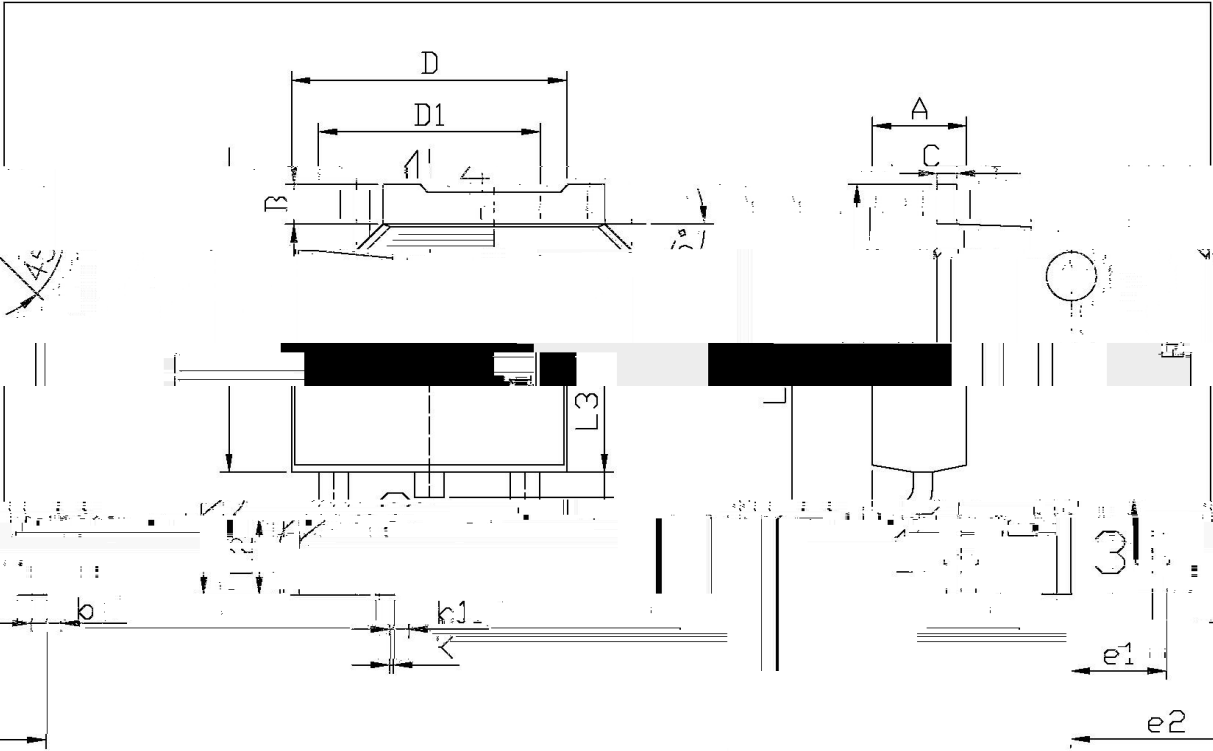
/ **Electrical Characteristic Curve**



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Figure 10: Normalized Maximum Transient Thermal Impedance

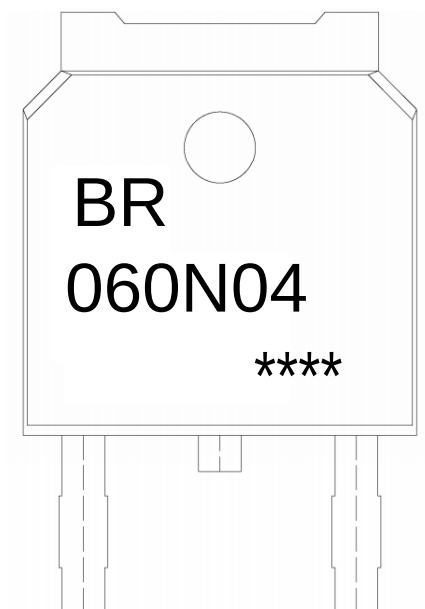
/ Package Dimensions



单位: mm

Symbol		Dimensions In Millimeters		Symbol		Dimensions In Millimeters	
		Min	Max			Min	Max
95		6.25		A		2.20	2.20
2.24		2.34		B		0.95	1.25
1.24		1.24		b1		0.45	0.55
9.85		10.35		D		6.45	6.75
60		0.90	1.15	L1		1.70	2.00
K		0.00	0.10	L3		0.75	0.80
-252				T			

/ Marking Instructions



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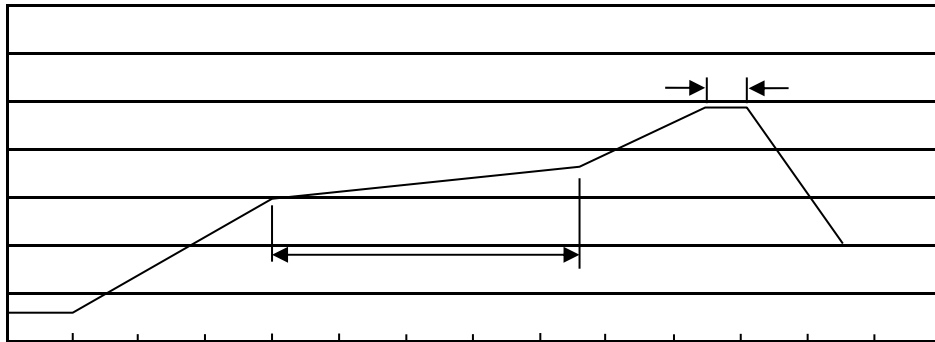
Note:

BR: Company Code

060N04: Product Type Code

****: Lot No. Code, code change with Lot No

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



Note:

- | | | | | | |
|---|-------|-----|-----------|--------|---|
| 1 | 150 | 180 | 60 | 90sec; | 1.Preheating:150~180 , Time:60~90sec. |
| 2 | 245±5 | | 5±0.5sec; | | 2.Peak Temp.:245±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	Units					Dimension (unit mm ³)		
	Units/Reel /	Reels/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Reel	Inner Box	Outer Box
TO-252	2,500	2	5,000	6	30,000	13" ×16	360×360×50	380×335×366

/ TUBE

Package Type	Units					Dimension (unit mm ³)		
	Units/Tube /	Tubes/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Tube	Inner Box	Outer Box
TO-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

/ Notices