

BRCS060N04DP

Rev.A Aug.-2023

/ Descriptions

TO-252 N

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

/ Features

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

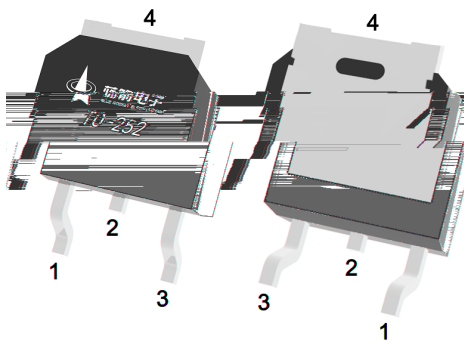
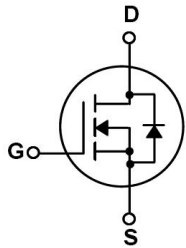
$R_{DS(ON)}@10V<6m\Omega$ (Typ. 5.6mR)

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

HF Product.

/ Applications

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.



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

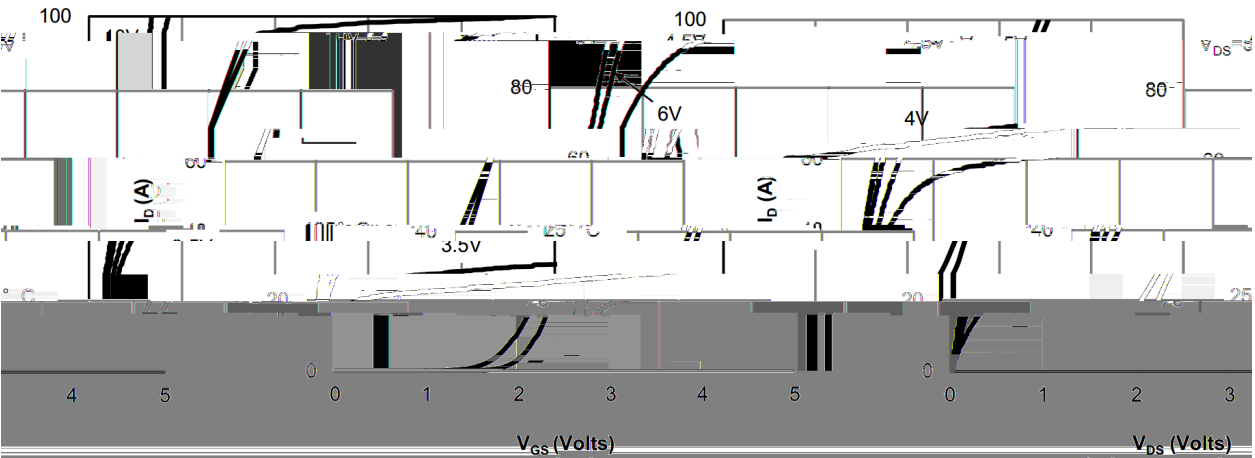


Figure 2: Transfer Characteristics Figure 1: On-Region Characteristics

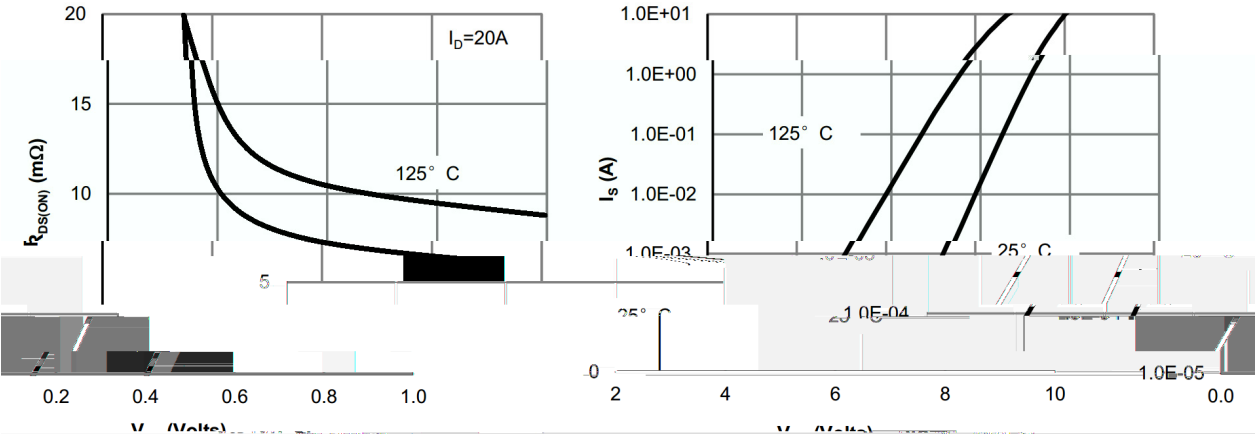
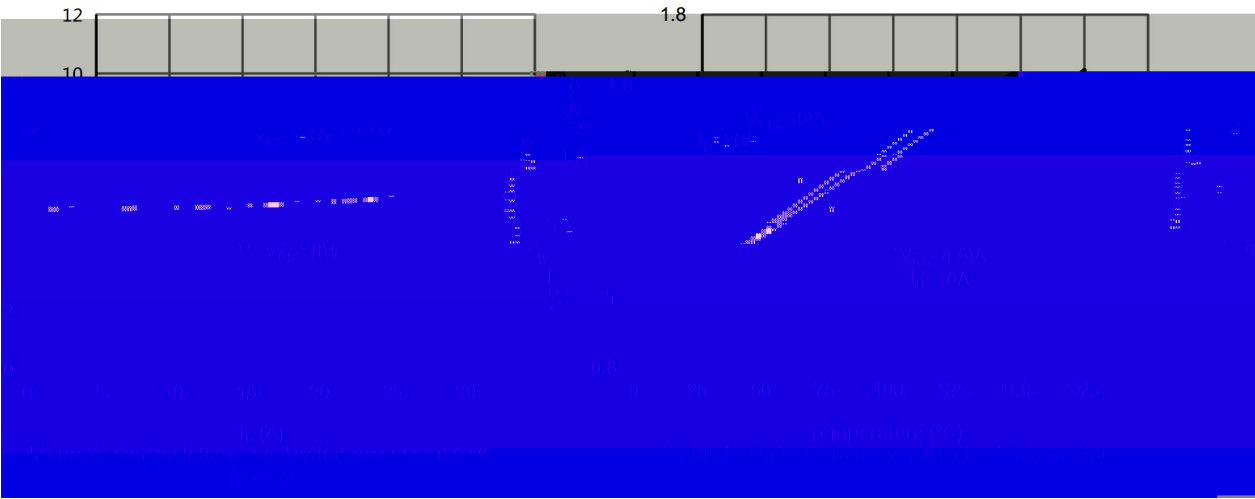
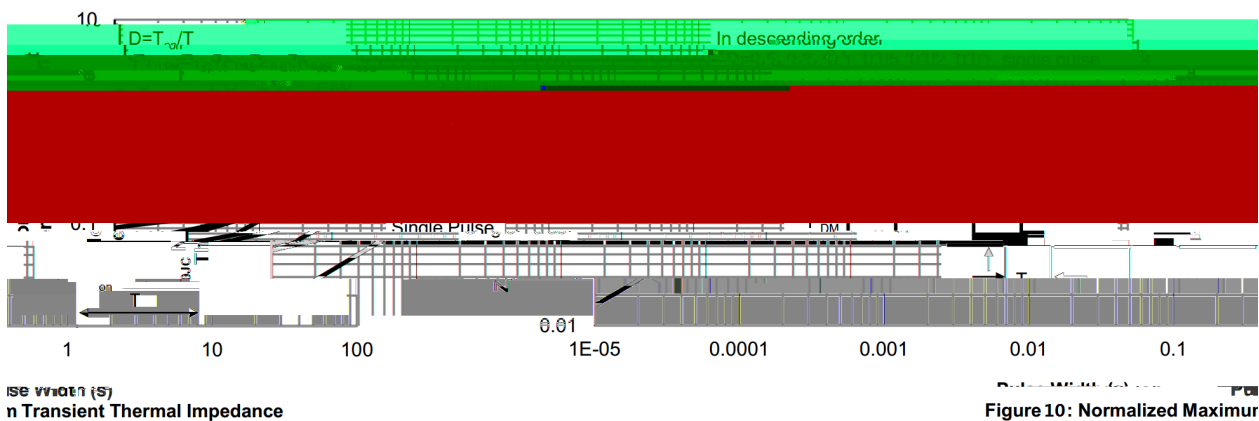
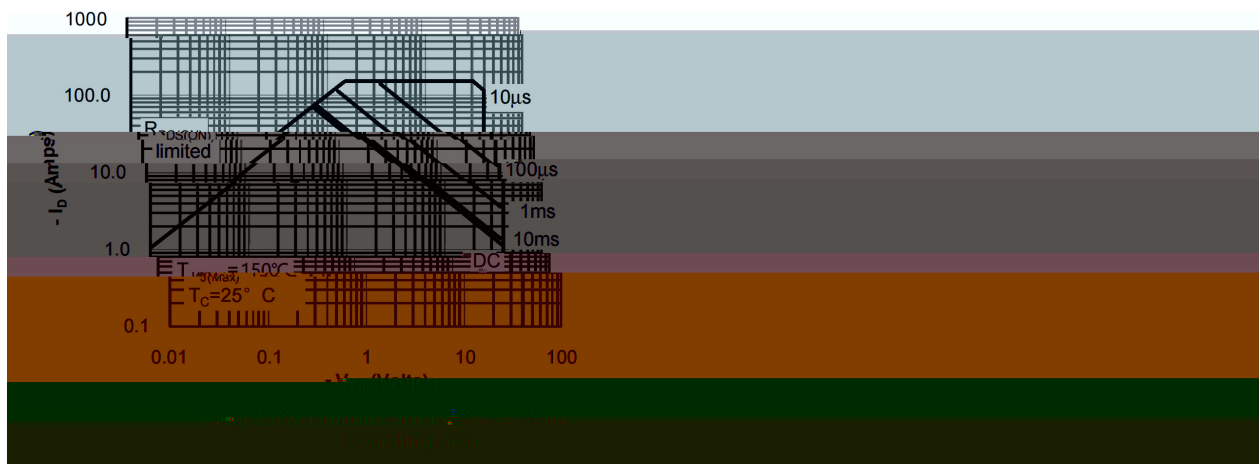
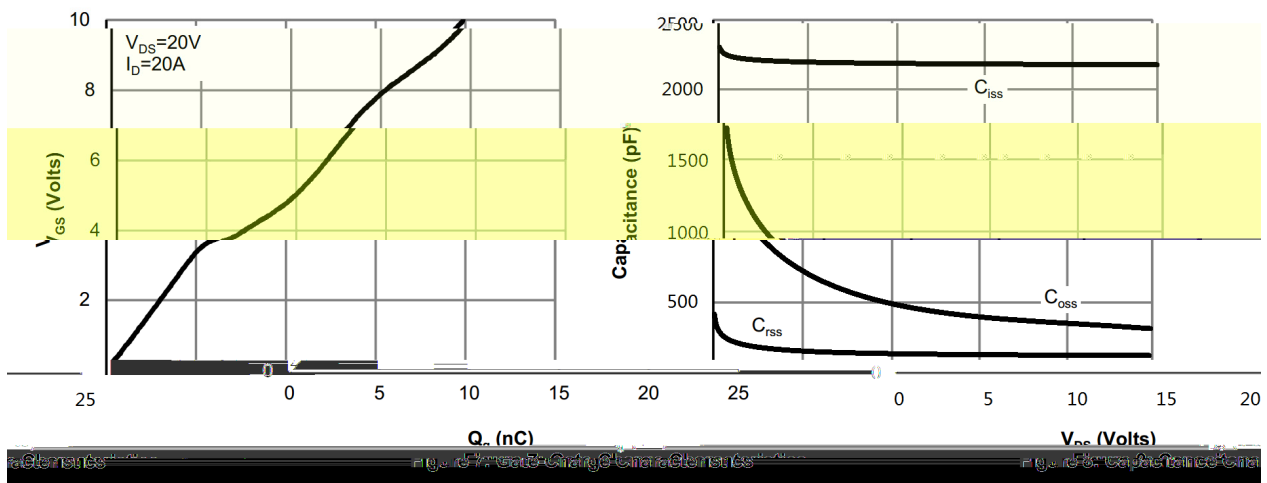


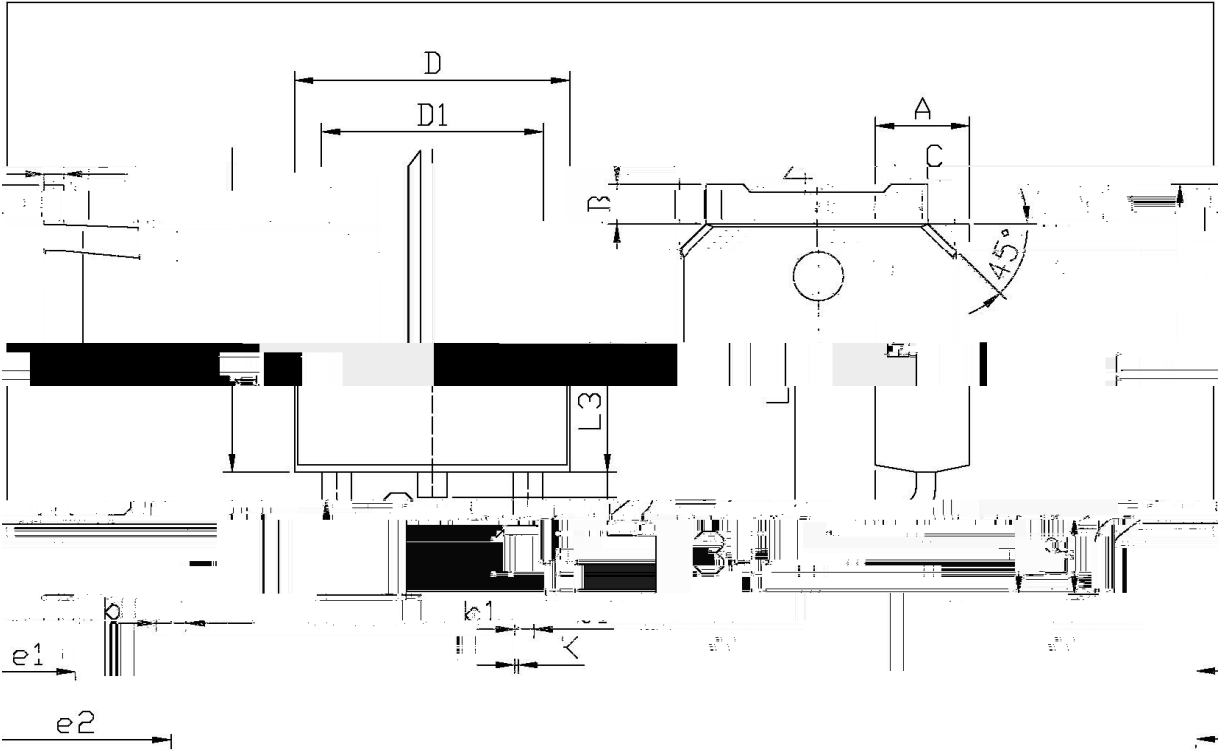
Figure 6: Body-Diode Characteristics Figure 5: On-Region Characteristics



/ Electrical Characteristic Curve


 Figure 9: Transfer Characteristics
 Figure 10: Capacitance Characteristics
 Figure 11: Power Dissipation Characteristics
 Figure 12: Thermal Characteristics
 Figure 13: Normalized Maximum Power Dissipation

/ Package Dimensions

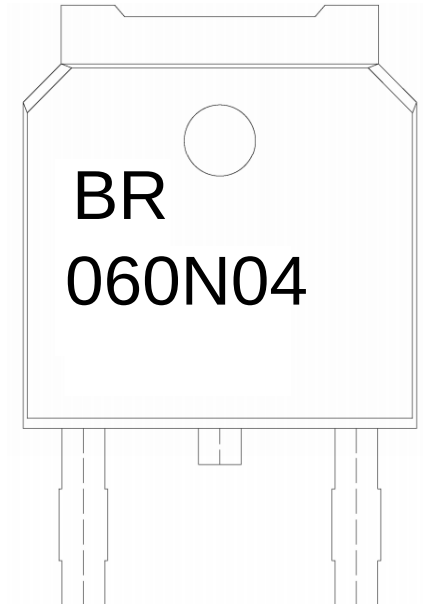


单位: mm

Dimensions In Millimeters			Dimensions In Millimeters		
Symbol	Min	Max	Symbol	Min	Max
A	0.20	2.40	B	5.00	5.10
e1	0.95	2.24	B	2.34	
e2	0.20	4.73			
L1	0.45	0.55	L1	9.85	10.35
L2	0.45	0.55	L2	1.70	2.00
D1	0.60	0.90	D1	6.45	6.75
L3	5.50	6.00	L3	5.10	

T0-252

/ **Marking Instructions**



BR

060N04

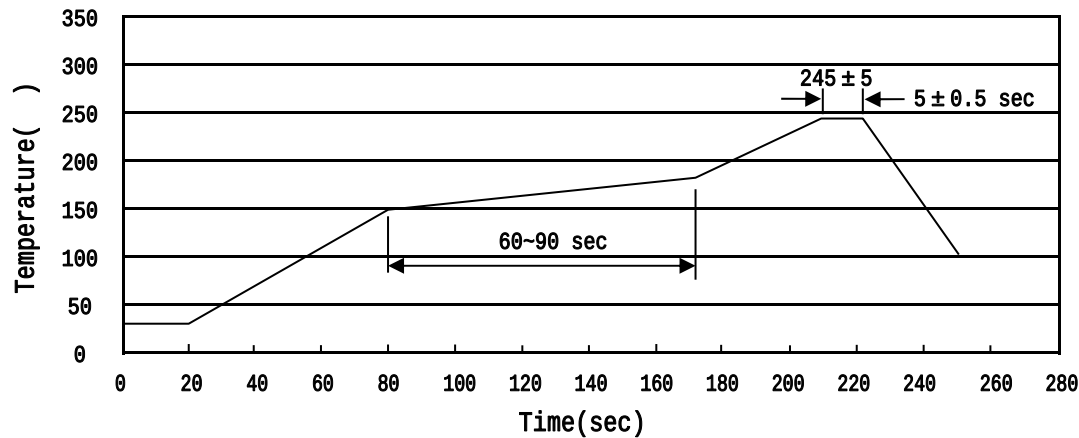
Note:

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)		
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)		
TO-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

/ Notices