

/ Descriptions

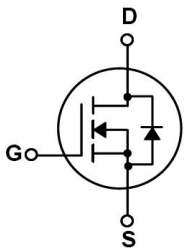
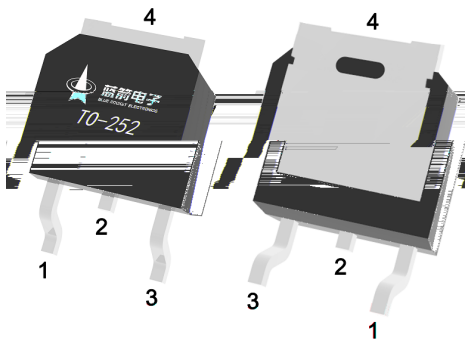
TO-252 SiC N MOS

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

/ Features $V_{DS}=650V$ $I_D=10A$ $R_{DS(on)}@15V \leq 390m\Omega$ (Type.300m Ω) $R_{DS(on)}@18V \leq 380m\Omega$ (Type.222m Ω)**/ Applications**

LED PD PC

LED driver, PD charger, PC adapter, Air-conditioning, E-bike charger.

/ Equivalent Circuit**/ Pinning**

PIN1 G

PIN 2 D

PIN 3 S

PIN 4 D

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings(Tc=25)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	650	V
Continuous DC Drain Current for $R_{th(j-c,typ.)}$, Limited by $T_{VJ(max)}$	$I_D(Tc=25)$	10	A
	$I_D(Tc=100)$	8.5	A
Peak Drain Current, tp Limited by $T_{VJ(max)}$	I_{DM}	18	A
Gate-Source Max Voltage	$V_{GS,max}$	-10/+22	V
Gate-Source Operate Voltage	$V_{GS,op}$	0/+15	V
Single Pulse Avalanche Energy	E_{AS}	17	mJ
Power Dissipation or $R_{th(j-c,typ.)}$	$P_D(Tc=25)$	57	W
Operating and Storage Temperature Range	T_{VJ}, T_{STG}	-55 to 175	
MOSFET/Body Diode Junction-Case Thermal Resistance	$R_{th(j-c)}$	2.63	/W

/ Electrical Characteristics(Tc=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=100\mu A$	650			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=3.5mA$	2		4	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650V$ $V_{GS}=0V$		0.1	20	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=22V$ $V_{DS}=0V$			250	nA
Source-Gate Leakage Current	I_{SGS}	$V_{GS}=-10V$ $V_{DS}=0V$			250	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=15V$ $I_D=5A$		300	390	m Ω
		$V_{GS}=15V$ $I_D=5A$ $T_{VJ}=175$		321		
		$V_{GS}=18V$ $I_D=5A$		222	380	
		$V_{GS}=18V$ $I_D=5A$ $T_{VJ}=175$		266		
Body Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=2.5A$		3.6		V
Continuous DC Source Current	I_S			9.7		A
Peak Reverse Drain Current,	I_{SM}			17		A
Reverse Recovery Time	t_{rr}	$V_{GS}=0V$, $I_{SD}=5A$, $V_R=400V$, $di/dt=1.1kA/us$		10.9		ns
Reverse Recovery Charge	Q_{rr}			28		nC
Peak Reverse Recovery Current	I_{rrm}			3.9		A
Reverse Recovery Energy	E_{rr}			0.22		μJ

/ Electrical Characteristics(Tc=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=0/15V$ $L=600\mu H$ $V_{DD}=400V$ $I_D=5A$ $R_g=4.3$		16.5		ns
Turn-On Rise Time	t_r			11.3		
Turn-Off Delay Time	$t_{d(off)}$			21.2		
Turn-Off Fall Time	t_f			12.7		
Turn-On Switching Loss	E_{on}			47.6		μJ
Turn-Off Switching Loss	E_{off}			4.0		
Total Switching Energy	E_{tot}			51.6		
Gate resistance	R_g	$V_{AC}=25mV$ $f=1MHz$		26		Ω
Input Capacitance	C_{iss}	$V_{DS}=400V$ $V_{GS}=0V$ $f=1MHz$		228		pF
Output Capacitance	C_{oss}			17		
Reverse Transfer Capacitance	C_{rss}			1.4		
Total Gate Charge	Q_g	$V_{GS}=0/15V,$ $V_{DS}=400V,$ $I_D=5A$		8.8		nC
Gate Source Charge	Q_{gs}			3.3		
Gate Drain Charge	Q_{gd}			1.2		

BRSC65R380ZDP

Rev.B Jun.-2026



DATA SHEET

/ Electrical Characteristic Curve

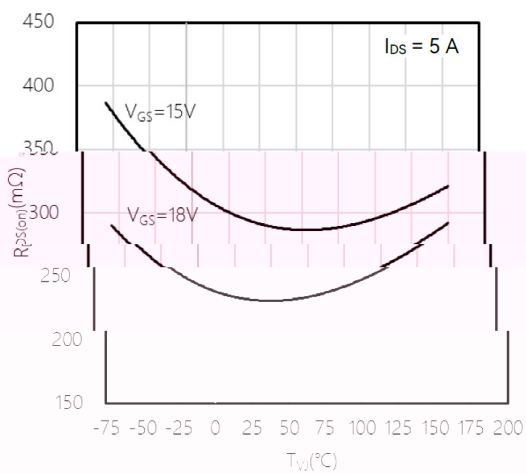


Fig.7. Typical on-state resistance as a function of temperature.

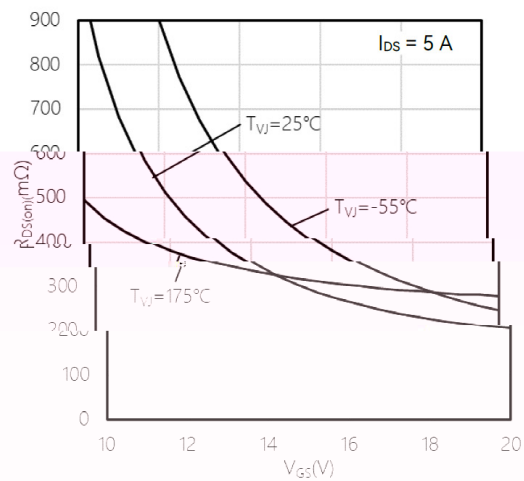
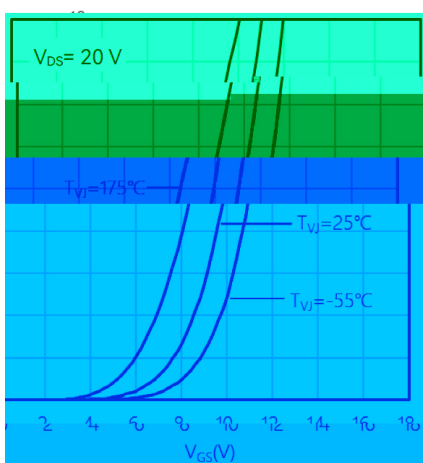
Fig.8. Typical on-state resistance as a function of V_{GS} 

Fig.9. Typical transfer characteristic

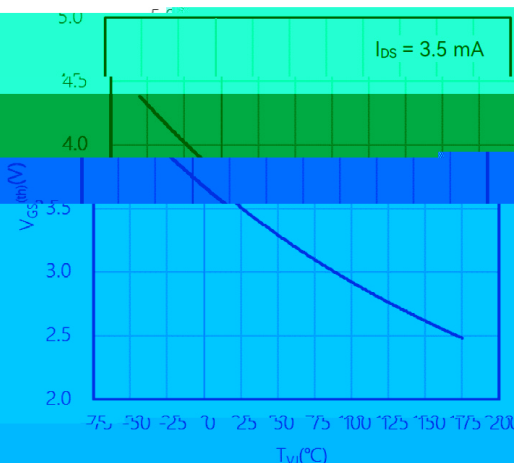


Fig.10. Typical gate-to-source threshold voltage

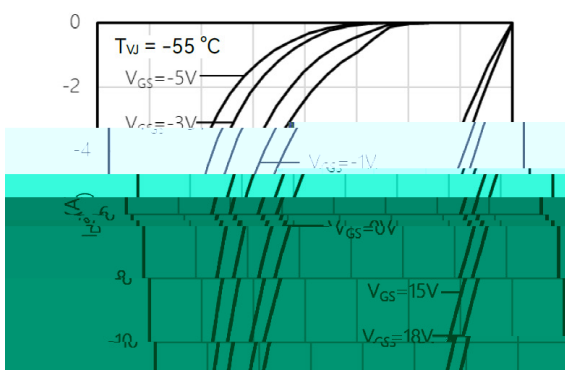


Fig.11. Typical reverse drain current as a function of reverse drain voltage

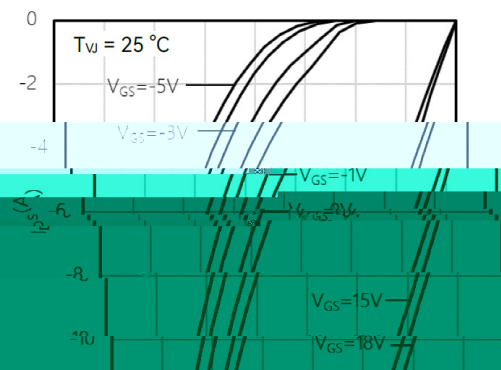


Fig.12. Typical reverse drain current as a function of reverse drain voltage

I Electrical Characteristic Curve

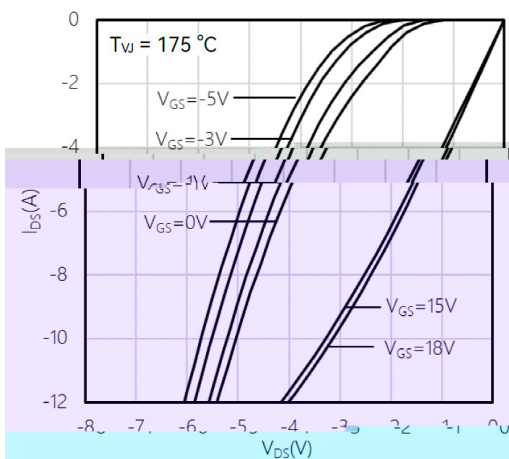


Fig13. Typical reverse drain current as function of reverse drain voltage

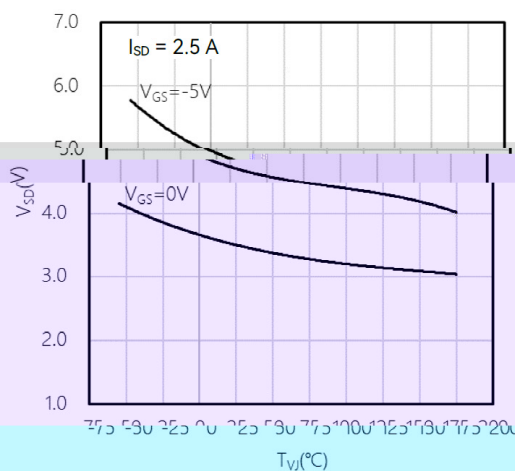
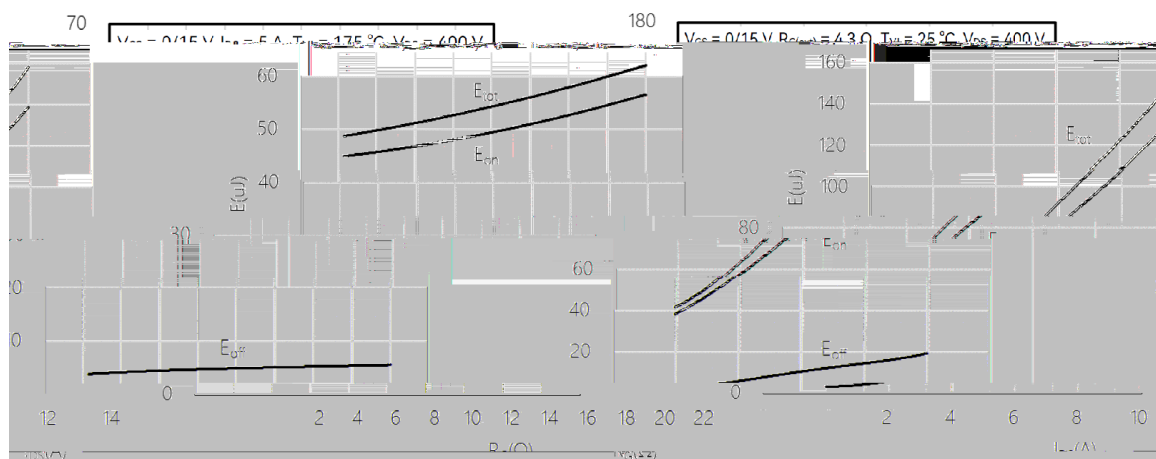
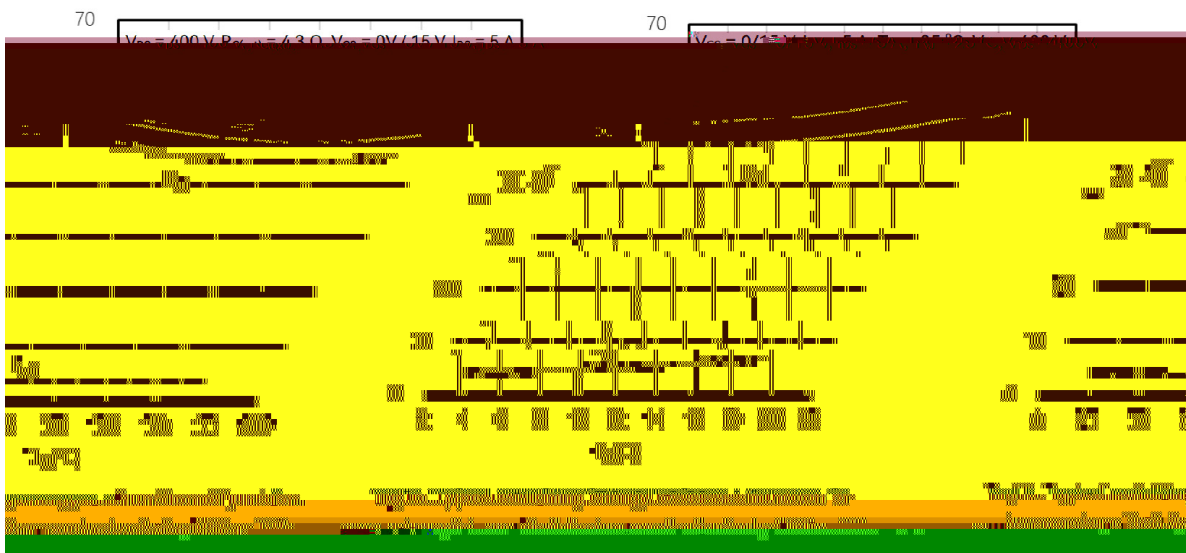


Fig14. Typical reverse drain voltage as function of junction temperature

Fig17. Typical switching energy losses as a function of $R_{ds(on)}$ Fig18. Typical switching energy losses as a function of I_{ds} Fig18. Typical switching energy losses as a function of I_{ds}

/ Electrical Characteristic Curve

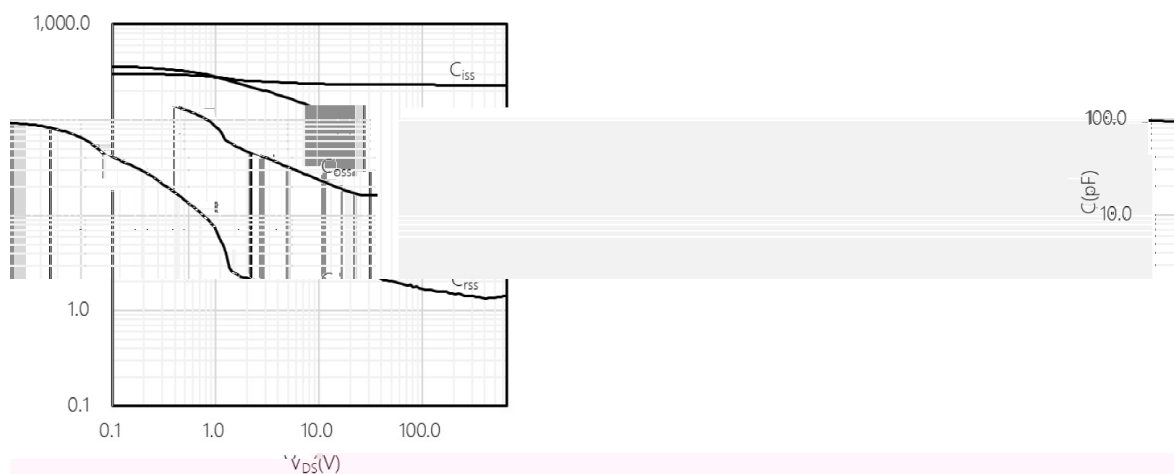
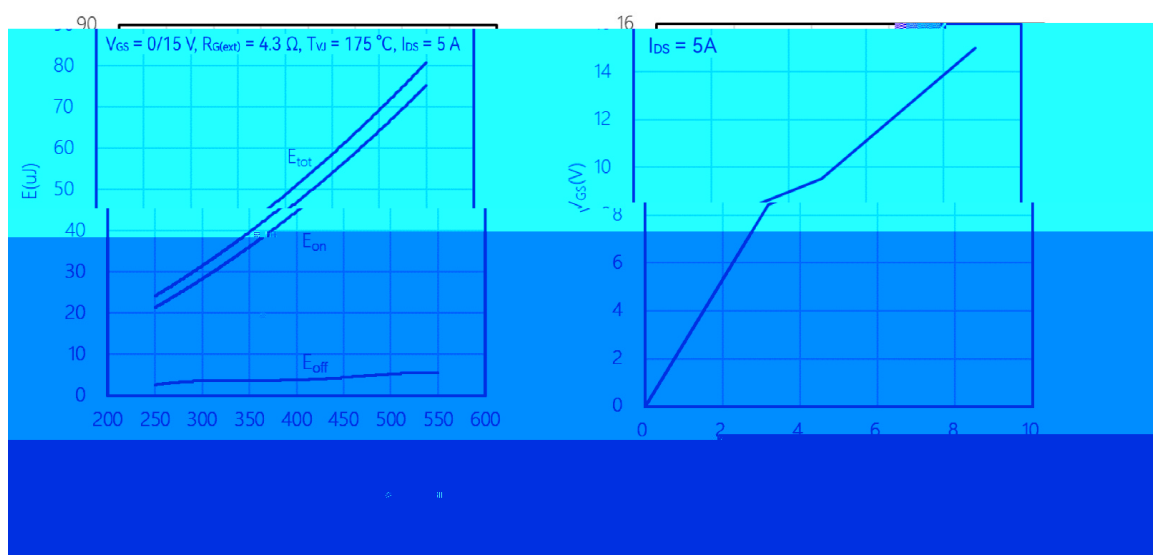
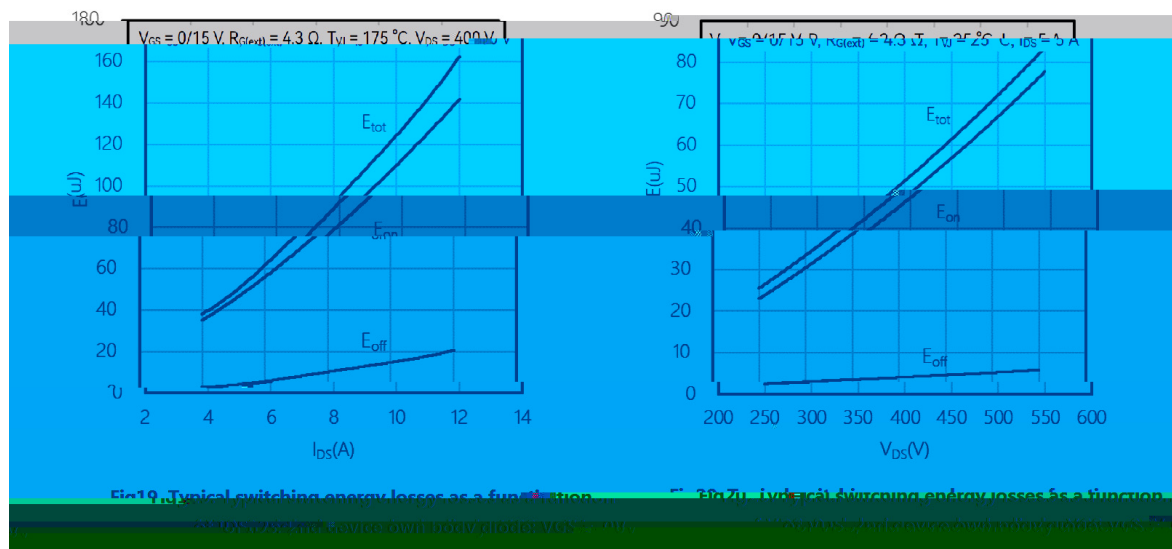
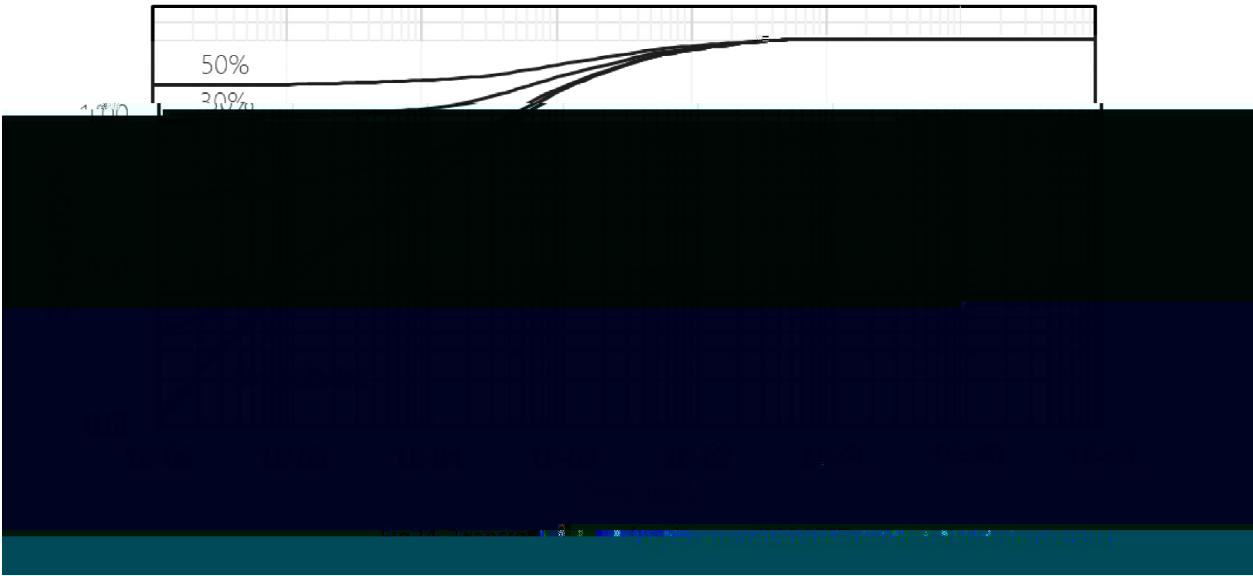
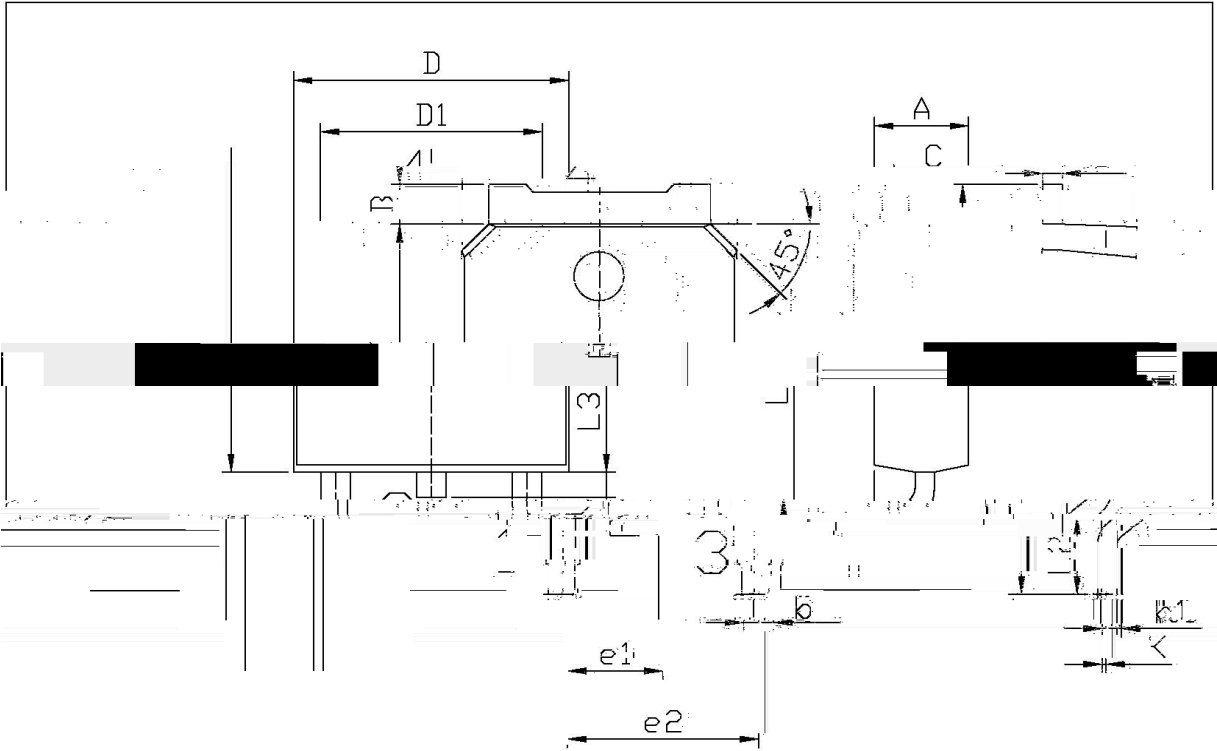


Fig21. Typical capacitance as a function of drain-source voltage

/ Electrical Characteristic Curve



/ Package Dimensions



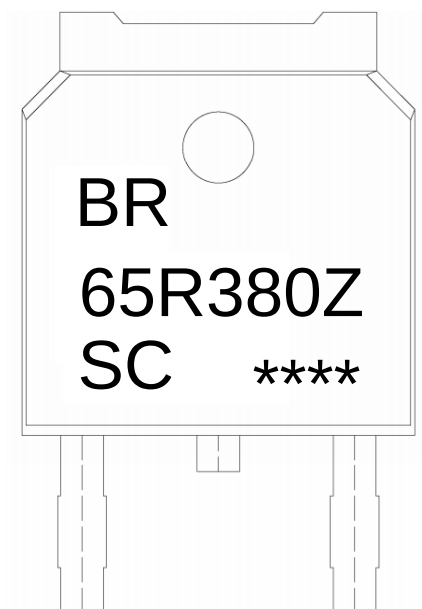
单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
E	5.95	6.25	A	2.20	2.40
e	2.24	2.34	B	0.95	1.25
L1	9.85	10.35	b1	0.70	0.90
L2	0.55	0.70	L3	0.55	0.70
D	6.45	6.75	K	0.50	0.60
D1	5.10	5.50			

T0-252



/ Marking Instructions



BR

65R380Z

SC

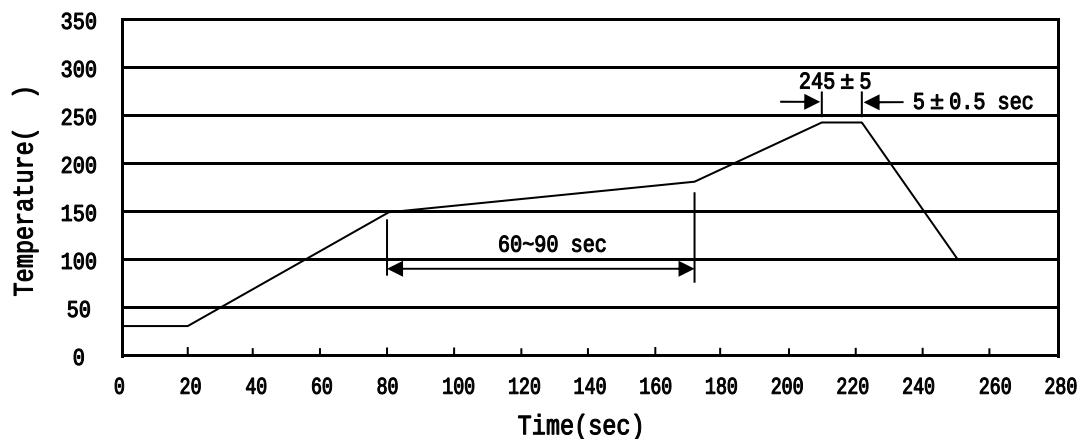
Note:

BR: Company Code

65R380Z: Product Type Code

SC: SiC

****: 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

All information provided in this document is subject to legal disclaimers.