

/ Descriptions

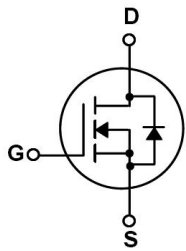
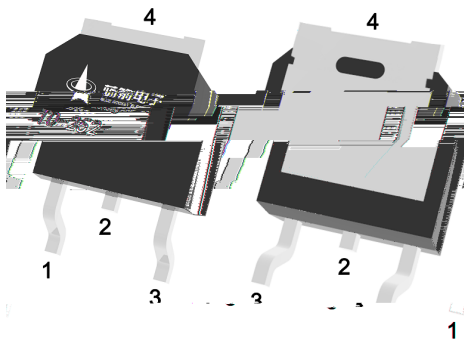
TO-252 SiC N MOS

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

BRSC65R380ZDP

Rev.C Jul.-2026

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		

/ Electrical Characteristic Curve

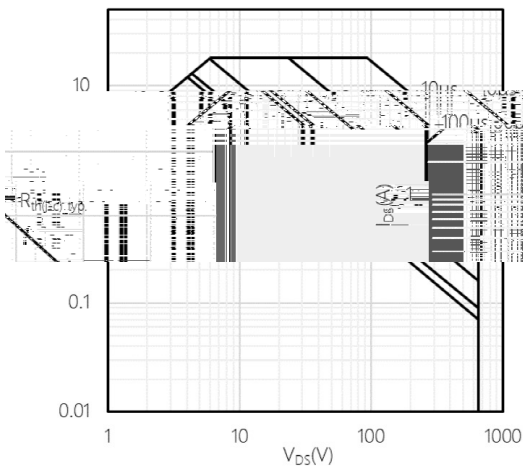


Fig1. Safe operating area (SOA)

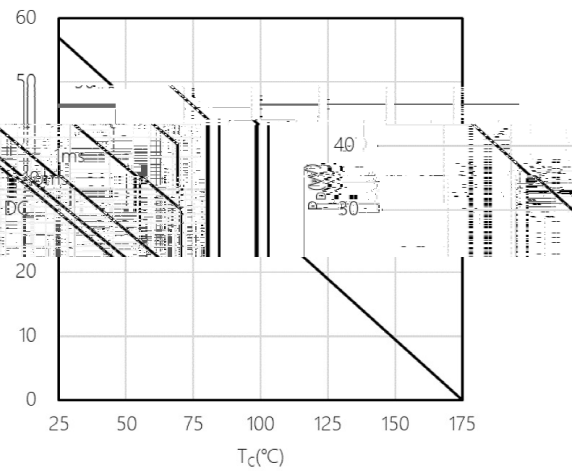


Fig2. Power dissipation

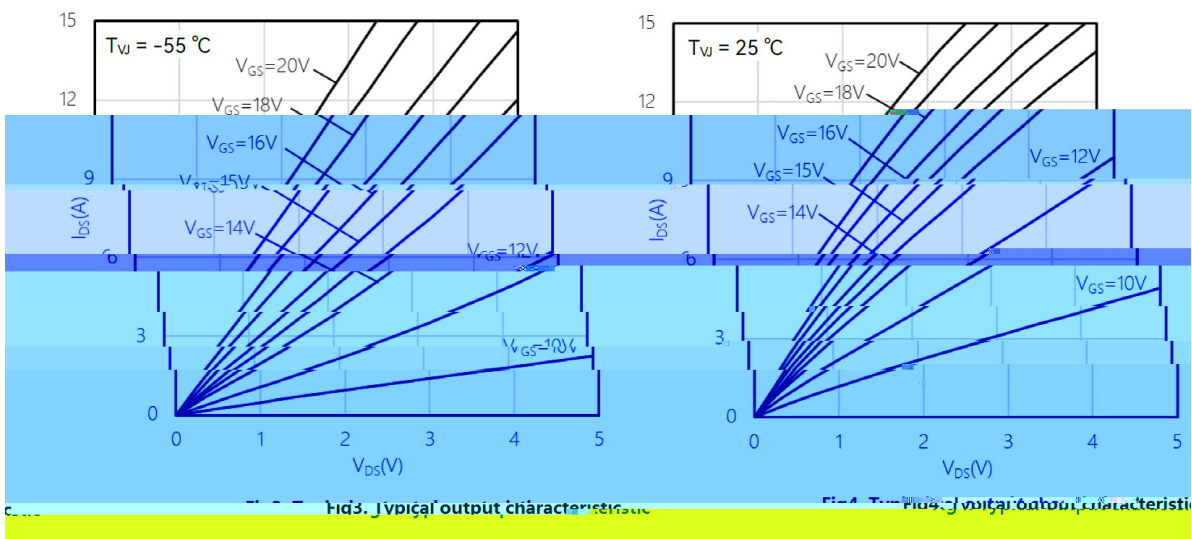


Fig3. Typical output characteristics

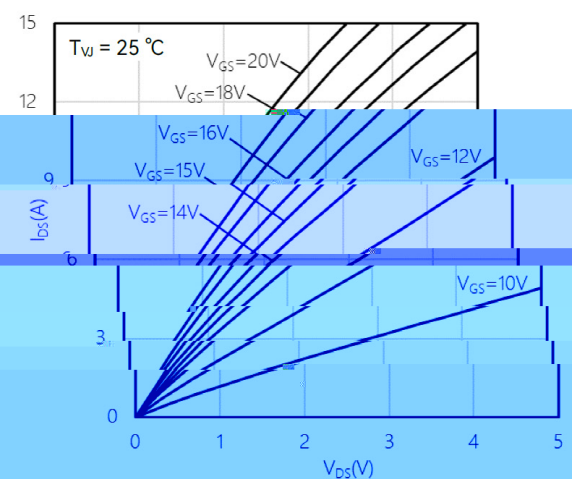


Fig4. Typical output characteristics

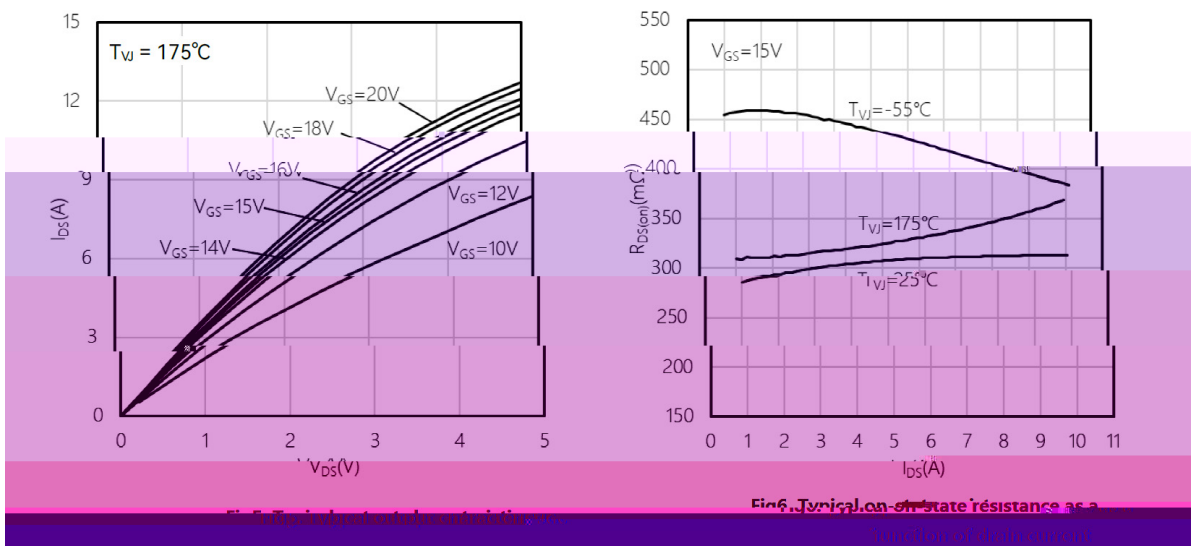


Fig5. Typical output characteristics

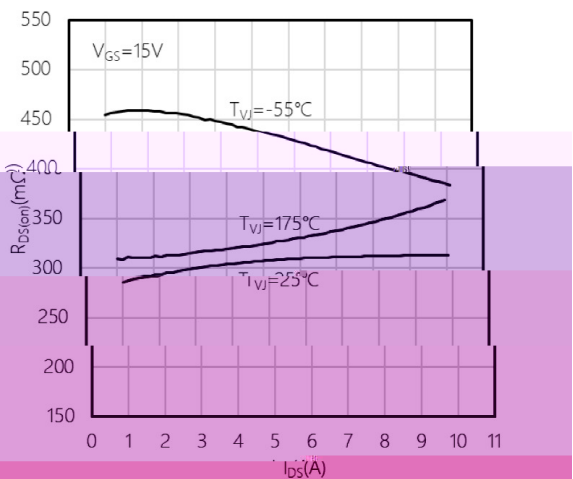
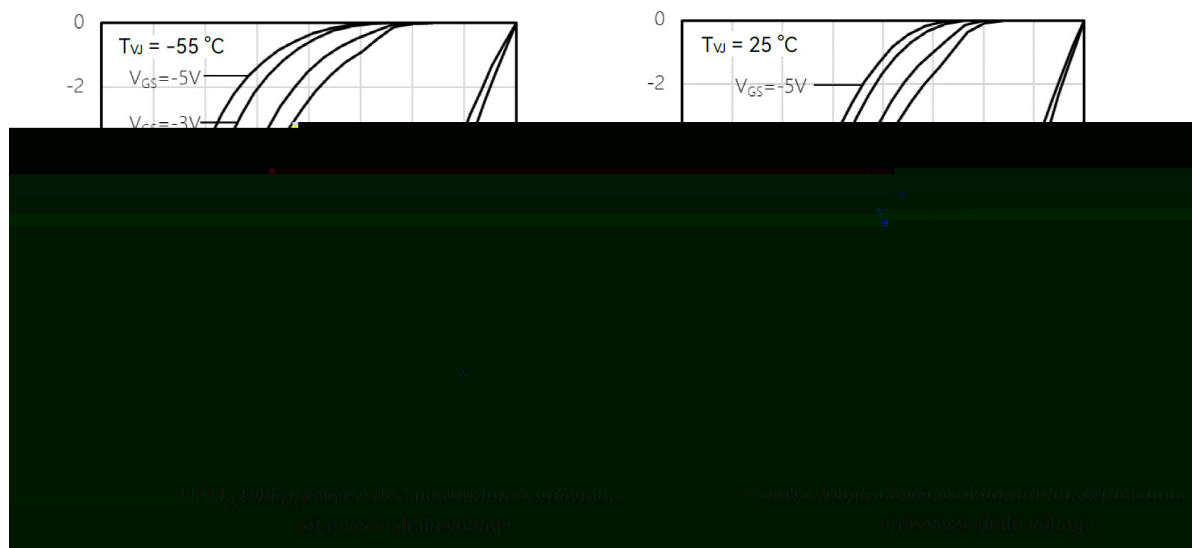
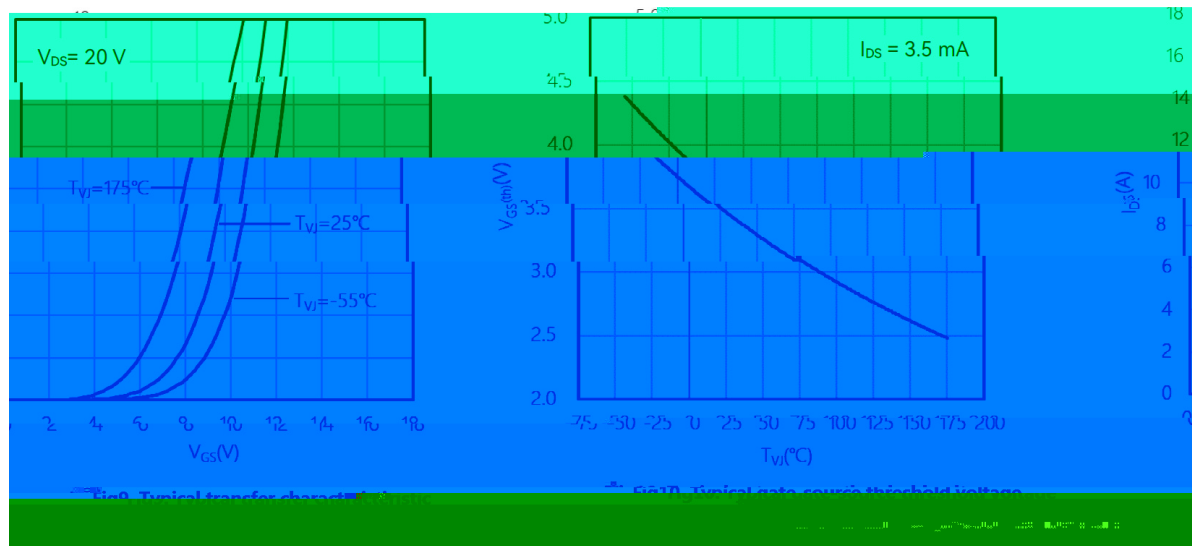
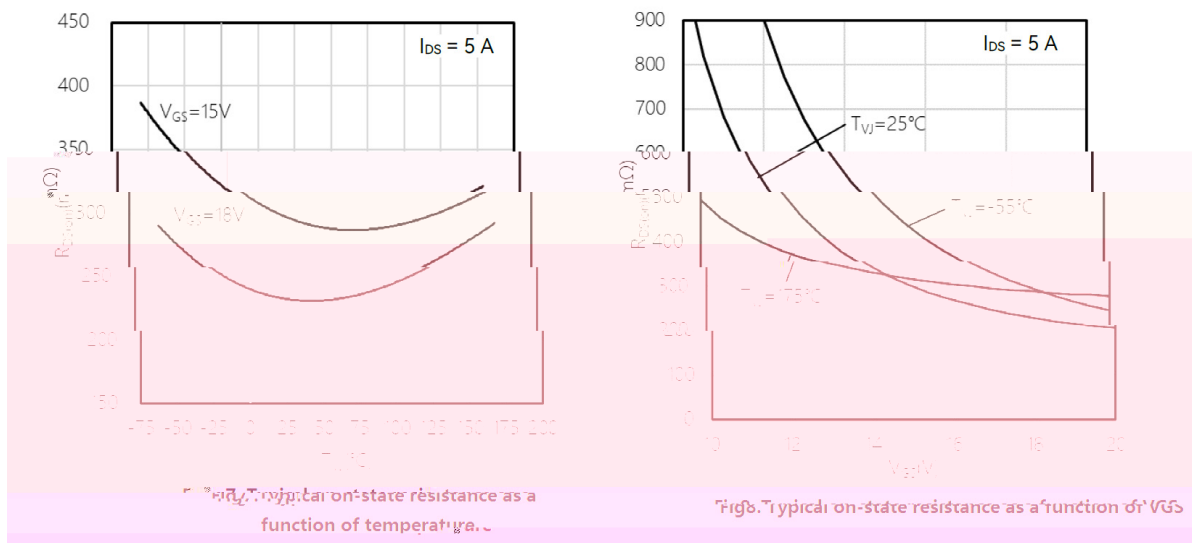


Fig6. Typical on-state resistance as a function of Ids(A)

/ Electrical Characteristic Curve



/ Electrical Characteristic Curve

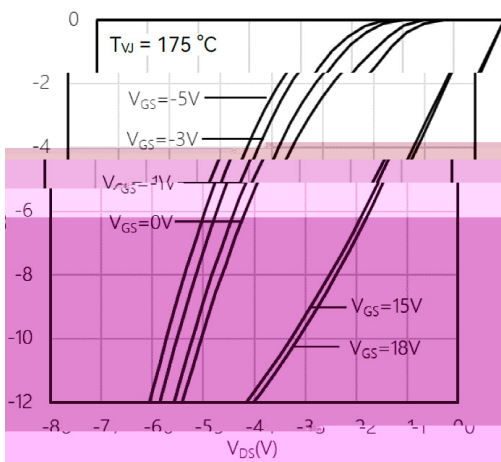


Fig13. Typical reverse drain current as function of reverse drain voltage

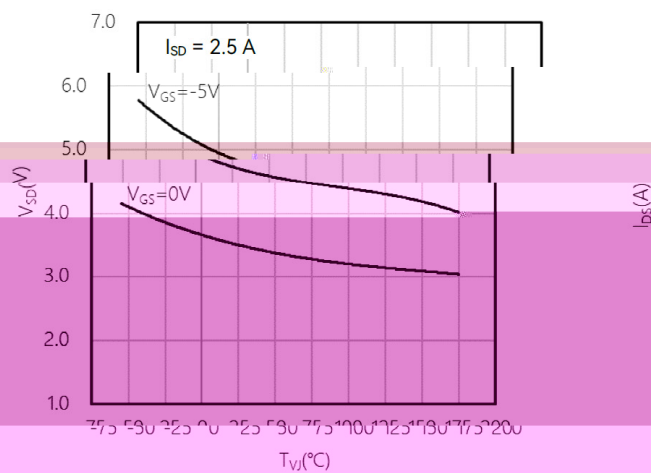


Fig14. Typical reverse drain voltage as function of junction temperature

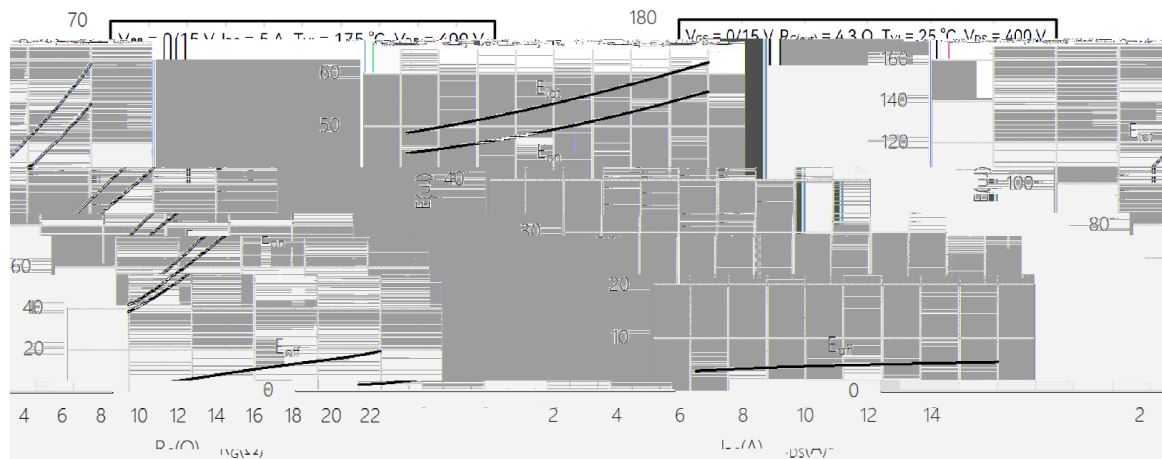
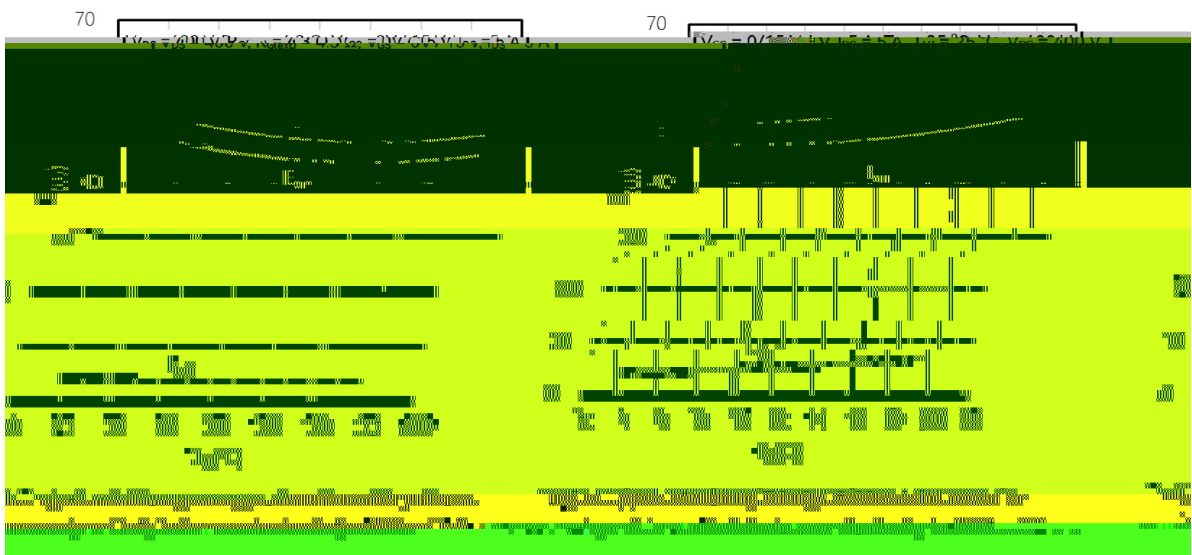


Fig17. Typical switching energy losses as a function of

Fig18. Typical switching energy losses as a function

/ Electrical Characteristic Curve

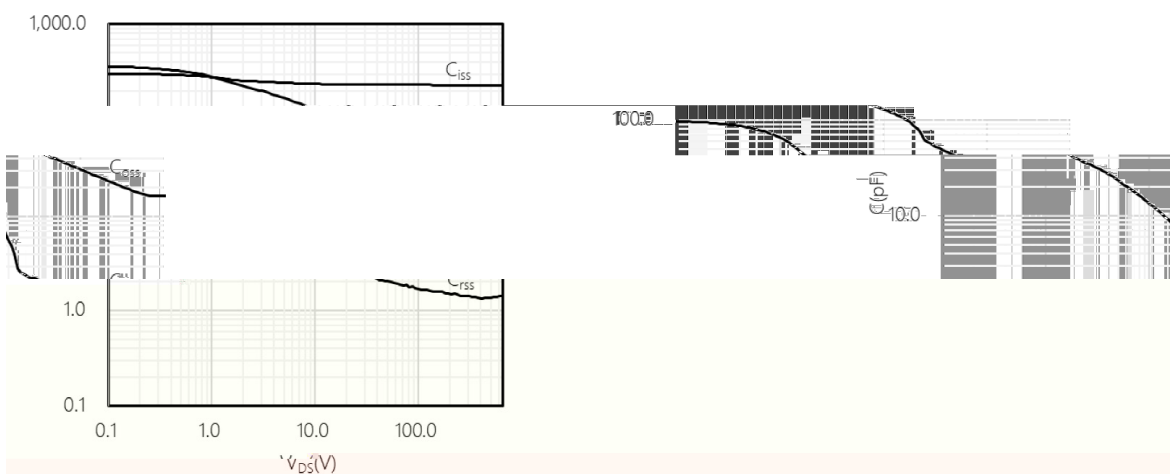
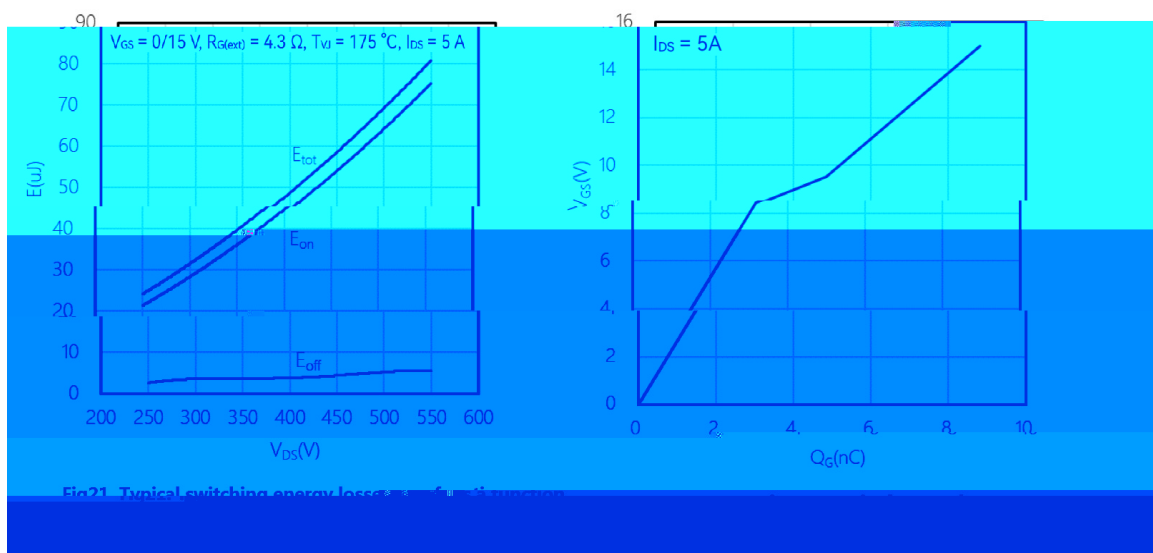
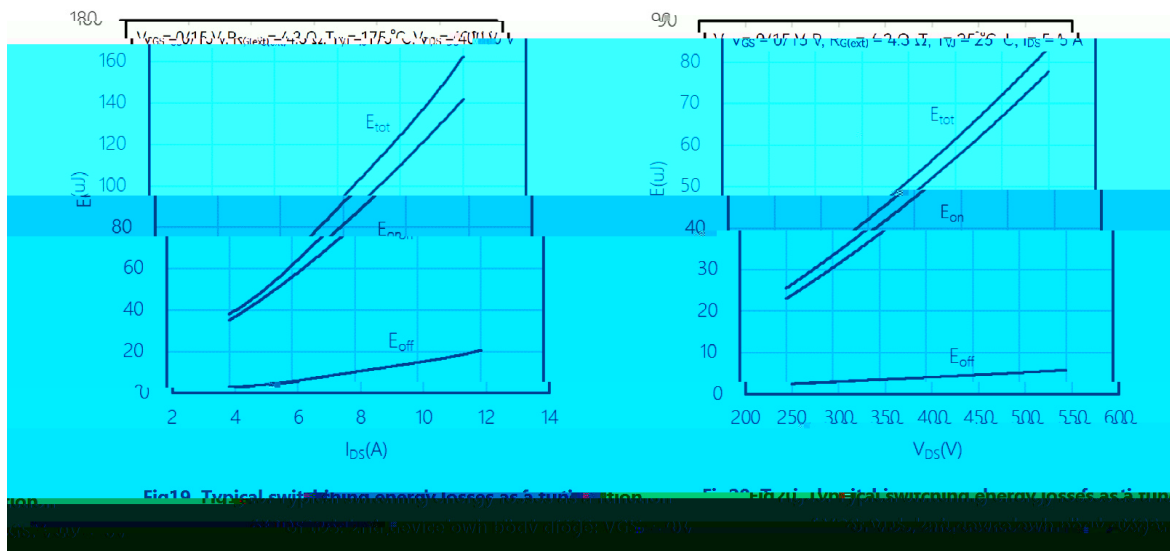
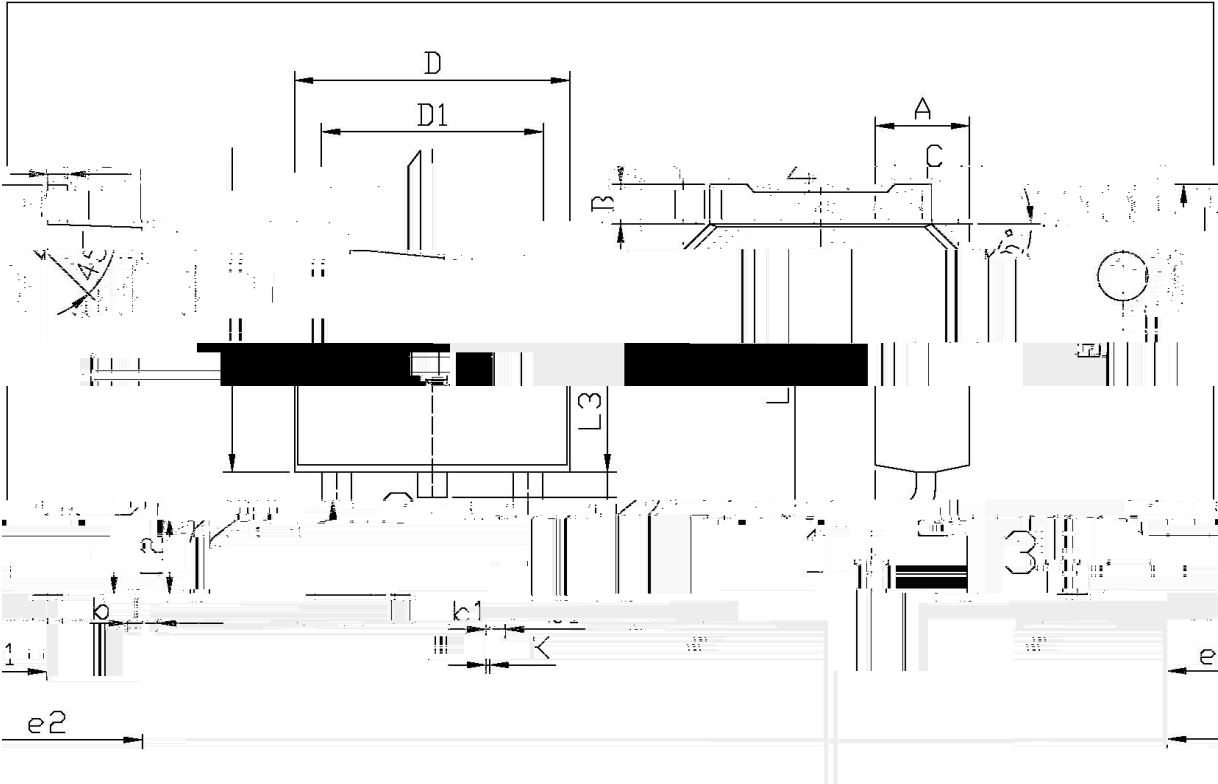


Fig22 Typical capacitance as a function of drain-source voltage

/ Package Dimensions



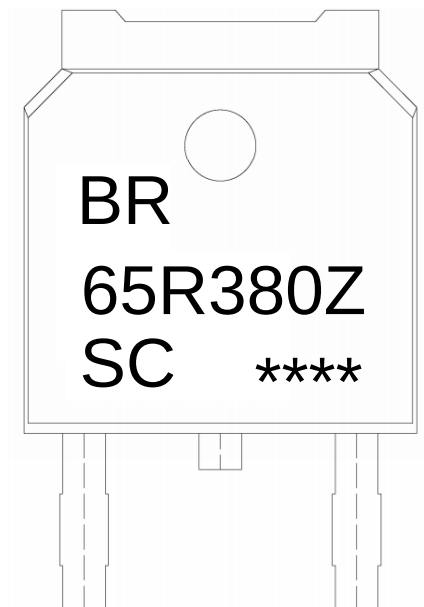
单位: mm

Symbol		Dimensions In Millimeters		Symbol		Dimensions In Millimeters	
		Min	Max			Min	Max
6.25	6.25			2.20	2.20	2.40	5.95
2.24	2.34			0.95	1.25		
6.25	6.32			0.60	0.62		
5.1	9.85	10.35		5.1	0.45	0.55	
		15	55	12	1.70	2.00	
13	0.60	0.90		11	6.45	6.75	
8	6.30	6.42		11	5.10	6.30	

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T0-2

/ Marking Instructions



BR

65R380Z

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Note:

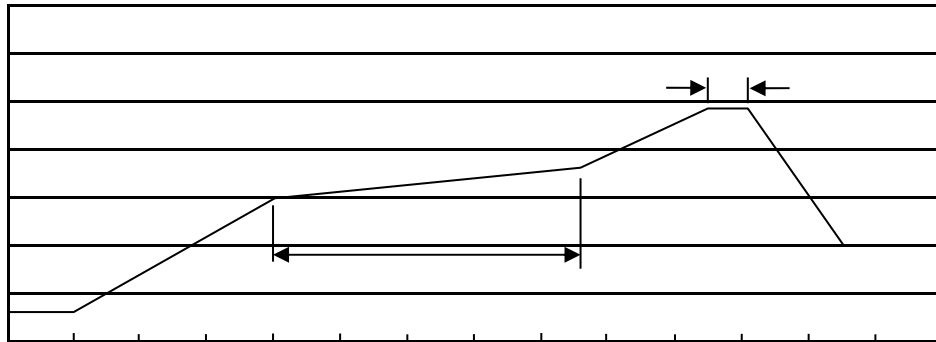
BR: Company Code

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

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