Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Normally – OFF Silicon Carbide Super Junction Transistor

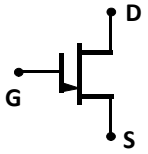
V_{DS}	=	650 V
$V_{DS(ON)}$	=	1.2 V
I_D	=	7 A
$R_{DS(ON)}$	=	170 mΩ

Features

- 250 °C maximum operating temperature
- Temperature independent switching performance
- Electrically isolated base-plate
- Gate oxide free SiC switch
- Suitable for connecting an anti-parallel diode
- Positive temperature coefficient for easy paralleling
- Low gate charge
- Low intrinsic capacitance

Package

- RoHS Compliant



TO – 257 (Isolated Base-plate Hermetic Package)

Advantages

- Low switching losses
- Higher efficiency
- High temperature operation
- High short circuit withstand capability

Applications

- Down Hole Oil Drilling, Geothermal Instrumentation
- Hybrid Electric Vehicles (HEV)
- Solar Inverters
- Switched-Mode Power Supply (SMPS)
- Power Factor Correction (PFC)
- Induction Heating
- Uninterruptible Power Supply (UPS)
- Motor Drives

Maximum Ratings at T_j = 250 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Drain – Source Voltage	V_{DS}	V_{GS} = 0 V	650	V
Continuous Drain Current	I_D	T_C = 158 °C	7	A
Gate Peak Current	I_{GM}		5	A
Reverse Gate – Source Voltage	V_{GS}		200	V
Reverse Drain – Source Voltage	V_{DS}		40	V
Power Dissipation	P_{tot}	T_C = 25 °C	8	W
Operating and Storage Temperature	T_j, T_{stg}		-55 to 250	°C

Electrical Characteristics at T_j = 250 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values min.	Values typ.	Values max.	Unit
On Characteristics						
Drain – Source On Voltage	$V_{DS(ON)}$	I_D = 7 A, I_G = 250 mA, T_j = 25 °C		1.2		V
		I_D = 7 A, I_G = 500 mA, T_j = 175 °C		2.2		
		I_D = 7 A, I_G = 500 mA, T_j = 250 °C		3.1		
Drain – Source On Resistance	$R_{DS(ON)}$	I_D = 7 A, I_G = 250 mA, T_j = 25 °C		170		mΩ
		I_D = 7 A, I_G = 500 mA, T_j = 175 °C		330		
		I_D = 7 A, I_G = 500 mA, T_j = 250 °C		550		
Gate Forward Voltage	$V_{GS(FWD)}$	I_G = 500 mA, T_j = 25 °C		3		V
		I_G = 500 mA, T_j = 250 °C		2.7		
DC Current Gain	β	V_{DS} = 5 V, I_D = 10 A, T_j = 25 °C		120		
		V_{DS} = 5 V, I_D = 10 A, T_j = 250 °C		80		
Off Characteristics						
Drain Leakage Current	I_{DSS}	V_R = 650 V, V_{GS} = 0 V, T_j = 25 °C		2.5		μA
		V_R = 650 V, V_{GS} = 0 V, T_j = 175 °C		4		
		V_R = 650 V, V_{GS} = 0 V, T_j = 250 °C		10		

Electrical Characteristics at T_j = 250 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 35 V, V_{GS} = 0 V, f = 1 MHz, T_{vj} = 25 °C		720		pF
Output Capacitance	C_{oss}			88		pF
Reverse Transfer Capacitance	C_{rss}			88		pF
Switching Characteristics						
Turn On Delay Time	$t_{d(on)}$	V_{DD} = 400 V, I_D = 10 A, $R_{G(on)}$ = $R_{G(off)}$ = 32 Ω, V_{GS} = -8/15 V ,T_j = 175 ºC Refer to Figure 10 for gate drive current waveforms		11		ns
Rise Time	t_r			28		ns
Turn Off Delay Time	$t_{d(off)}$			76		ns
Fall Time	t_f			38		ns
Turn-On Energy Per Pulse	E_{on}			34		µJ
Turn-Off Energy Per Pulse	E_{off}			64		µJ
Total Switching Energy	E_{ts}			98		µJ
Turn On Delay Time	$t_{d(on)}$	V_{DD} = 400 V, I_D = 10 A, $R_{G(on)}$ = $R_{G(off)}$ = 32 Ω, V_{GS} = -8/15 V ,T_j = 250 ºC Refer to Figure 10 for gate drive current waveforms		12		ns
Rise Time	t_r			30		ns
Turn Off Delay Time	$t_{d(off)}$			73		ns
Fall Time	t_f			58		ns
Turn-On Energy Per Pulse	E_{on}			43		µJ
Turn-Off Energy Per Pulse	E_{off}			82		µJ
Total Switching Energy	E_{ts}			125		µJ
Thermal Characteristics						
Thermal resistance, junction - case	R_{thJC}			2.5		°C/W

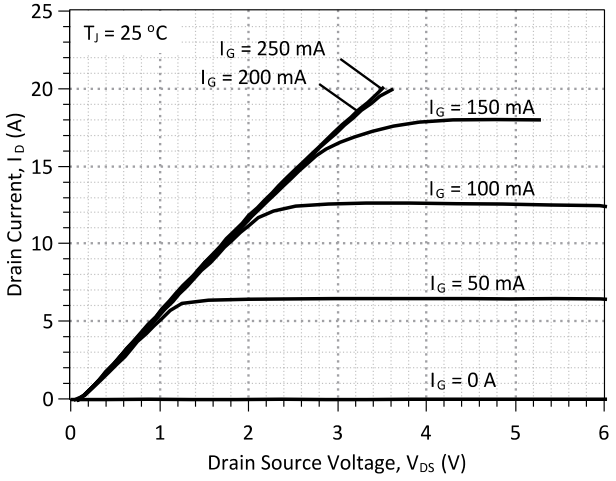


Figure 1: Typical Output Characteristics at 25 °C

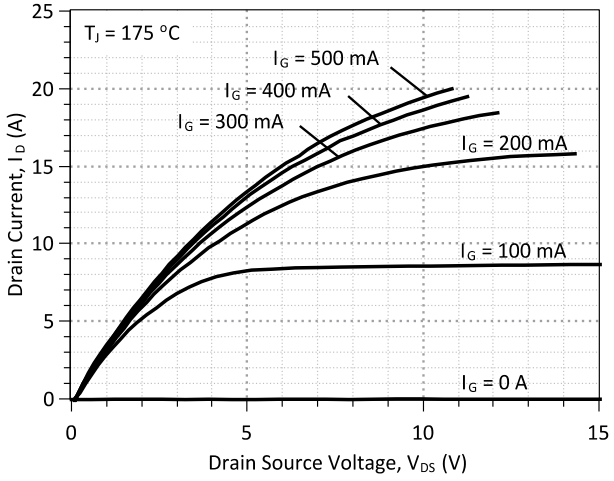


Figure 2: Typical Output Characteristics at 175 °C

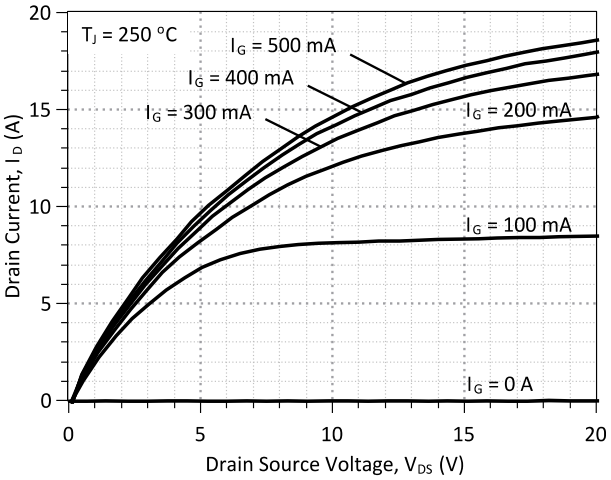


Figure 3: Typical Output Characteristics at 250 °C

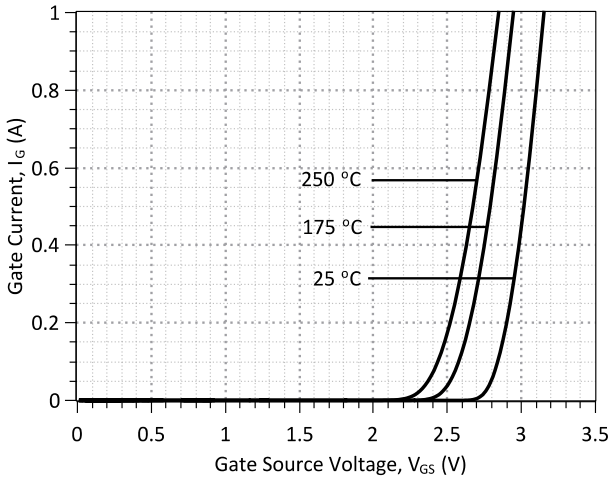


Figure 4: Typical Gate Source I-V Characteristics vs. Temperature

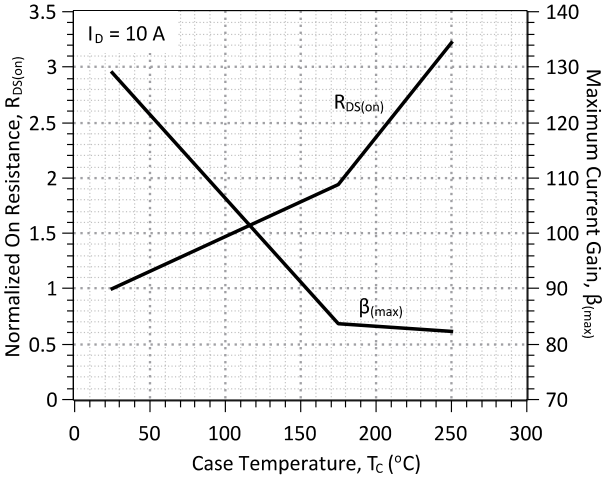


Figure 5: Normalized On-Resistance and Current Gain vs. Temperature

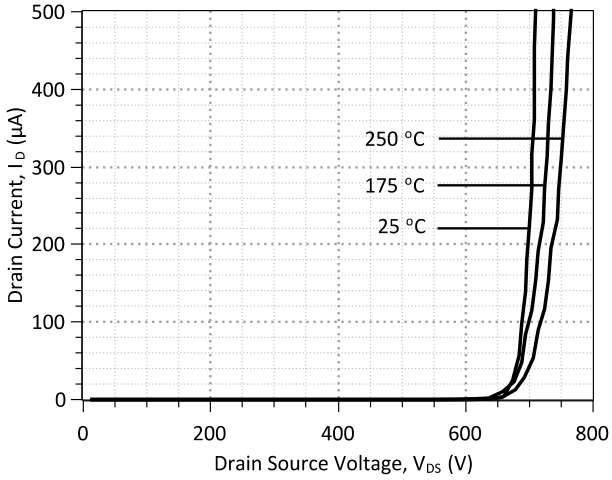


Figure 6: Typical Blocking Characteristics

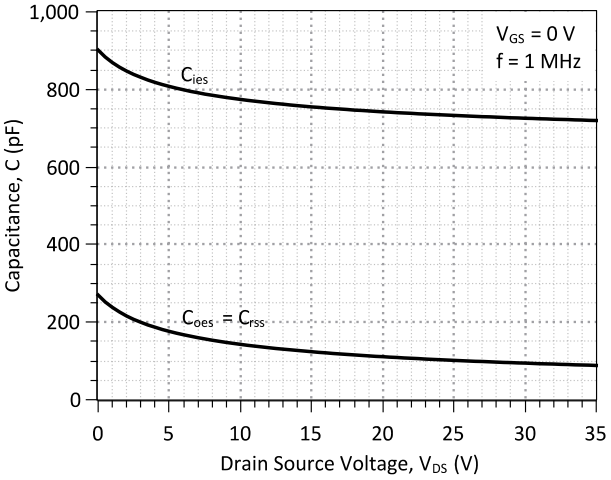


Figure 7: Typical Capacitance vs Drain-Source Voltage

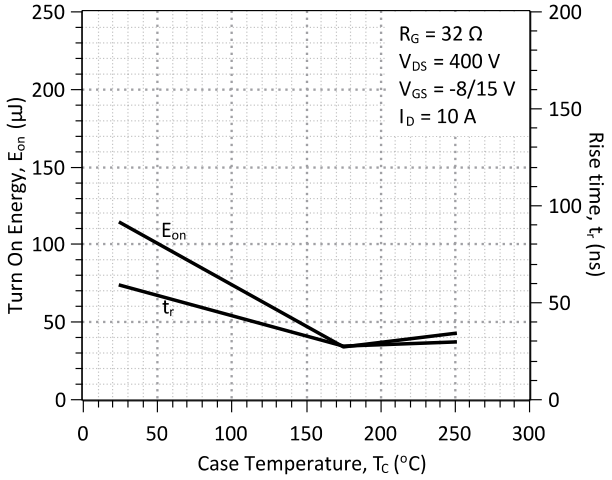


Figure 8: Typical Turn On Energy Losses and Switching Times vs. Temperature

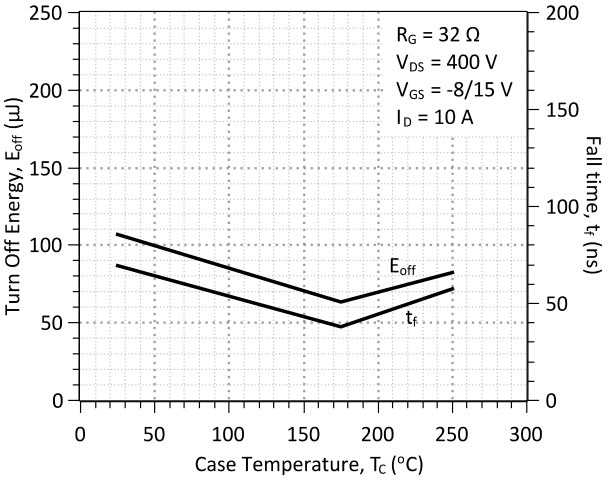


Figure 9: Typical Turn Off Energy Losses and Switching Times vs. Temperature

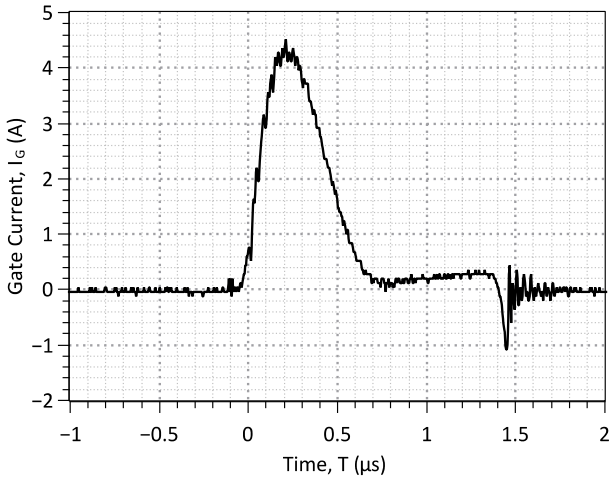
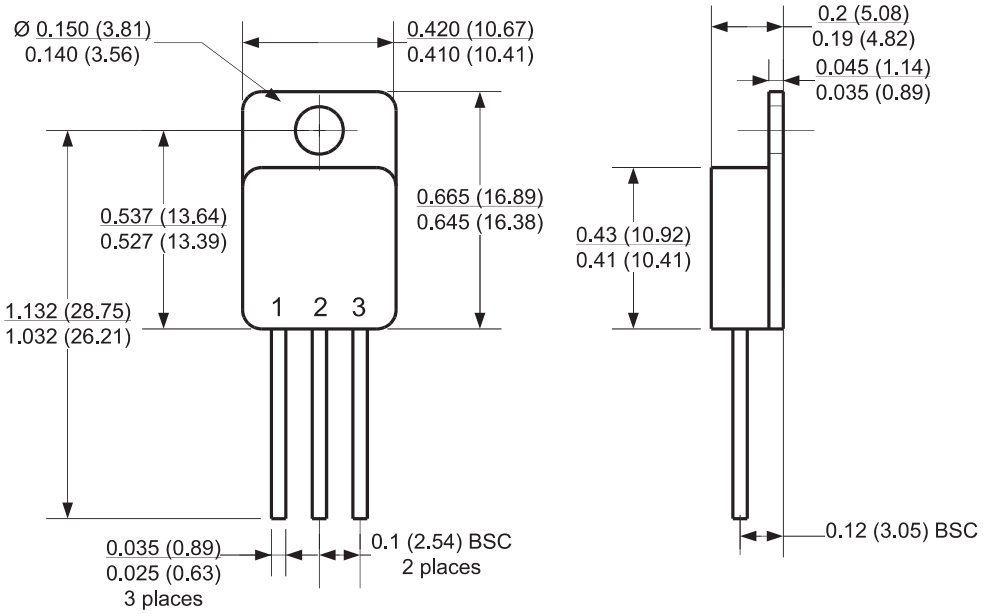


Figure 10: Typical Gate Current Waveform

Package Dimensions:

TO-257 **PACKAGE OUTLINE**



NOTE
1. CONTROLLED DIMENSION IS INCH. DIMENSION IN BRACKET IS MILLIMETER.
2. DIMENSIONS DO NOT INCLUDE END FLASH, MOLD FLASH, MATERIAL PROTRUSIONS

Revision History			
Date	Revision	Comments	Supersedes
2012/08/24	0	Initial release	

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