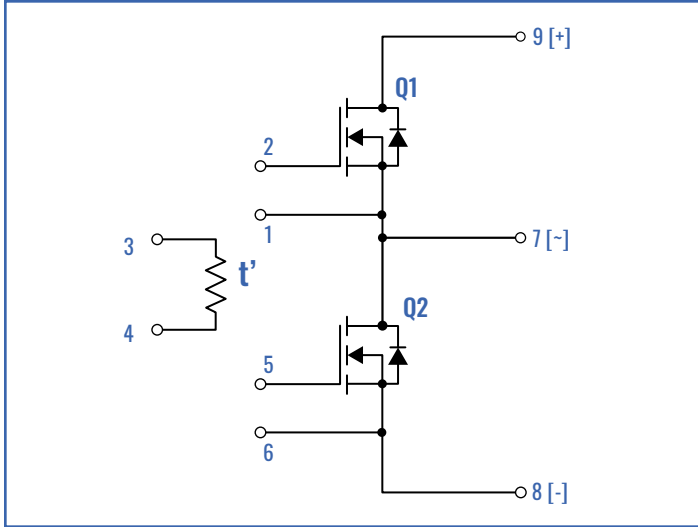


$$V_{DS} = 1200V$$

$$R_{DSon} = 8m\Omega$$

$$I_D = 120A @ T_c = 25^\circ C$$



### PIN CONNECTIONS

PIN	DESCRIPTION
1	S1
2	G1
3	Temp. Monitoring
4	Temp. Monitoring
5	G2
6	S2
7	AC
8	N
9	P

### FEATURES & BENEFITS

- SUPERIOR SYSTEM EFFICIENCY DUE TO LOW SWITCHING AND CONDUCTIONS LOSSES OF SiC
- OUTSTANDING POWER CONVERSION EFFICIENCY AT HIGH FREQUENCY OPERATION
- HIGH SPEED SWITCHING W/ LOW CAPACITANCE
- REDUCED PARASITIC INDUCTANCE AND CAPACITANCE
- REAL KELVIN SOURCE CONNECTION FOR STABLE GATE DRIVE
- ISOLATED BACKSIDE FOR DIRECT MOUNT TO HEATSINK
- ALN SUBSTRATE AND CUMO BASEPLATE FOR THERMAL CONDUCTIVITY
- HIGH JUNCTION TEMPERATURE OPERATION
- LOW JUNCTION TO CASE THERMAL RESISTANCE
- REDUCED THERMAL REQUIREMENTS AND SYSTEM COST
- INTEGRATED NTC TEMPERATURE SENSOR
- RUGGED MOUNTING DUE TO INTEGRATED MOUNTING BUSHINGS
- LOW PROFILE COMPACT PACKAGE



**ABSOLUTE MAXIMUM RATINGS ( $T_c = 25^\circ\text{C}$ )**

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE	UNIT
$V_{DS,max}$	Drain-Source Voltage		1200	V
$V_{GS}$	Gate-Source Voltage	DC	-20/+20	V
$I_D$	Continuous Drain Current		120	A
$I_{D,pulse}$	Pulsed Drain Current	Pulse Width $t_p$ Limited by $T_{j,max}$	200	A
$E_{AS}$	Single Pulsed Avalanche Energy	$L = 15\text{mH}$ , $I_{AS} = 8.6\text{A}$ , starting $T_j = 25^\circ\text{C}$	550	mJ
$T_{j(max)}$	Maximum Junction Temperature		175	$^\circ\text{C}$
$T_j, T_{STG}$	Junction Temperature, Operating and Storage		-55 to 175	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS - STATIC ( $T_c = 25^\circ\text{C}$ )**

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} < 0\text{V}$ , $I_D = 1\text{mA}$	1200			V
$I_{DSS}$	Off -State Drain Current	$V_{GS} = 0\text{V}$ , $V_{DS} = 1200\text{V}$ , $T_j = 25^\circ\text{C}$		6	600	$\mu\text{A}$
		$V_{GS} = 0\text{V}$ , $V_{DS} = 1200\text{V}$ , $T_j = 175^\circ\text{C}$		65		
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$		5	$\pm 20$	$\mu\text{A}$
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS} = 12\text{V}$ , $I_D = 100\text{A}$ , $T_j = 25^\circ\text{C}$		8.6	11	$\text{m}\Omega$
		$V_{GS} = 12\text{V}$ , $I_D = 100\text{A}$ , $T_j = 125^\circ\text{C}$		13.5		
		$V_{GS} = 12\text{V}$ , $I_D = 100\text{A}$ , $T_j = 175^\circ\text{C}$		18.2		
$V_{G(th)}$	Gate Threshold Voltage	$V_{DS} = 5\text{V}$ , $I_D = 10\text{mA}$	4	4.7	6	V
$R_G$	Gate Resistance	$f = 1\text{MHz}$ , open drain		0.8	1.5	$\Omega$
$G_{fs}$	Transconductance	$V_{DS} = 5\text{V}$ , $I_D = 50\text{A}$ , $T_a = 25^\circ\text{C}$		208		S
		$V_{DS} = 5\text{V}$ , $I_D = 50\text{A}$ , $T_a = 175^\circ\text{C}$		135		

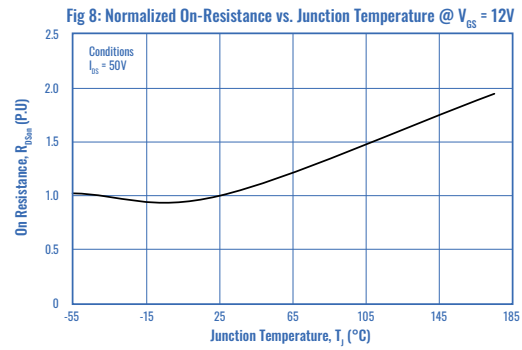
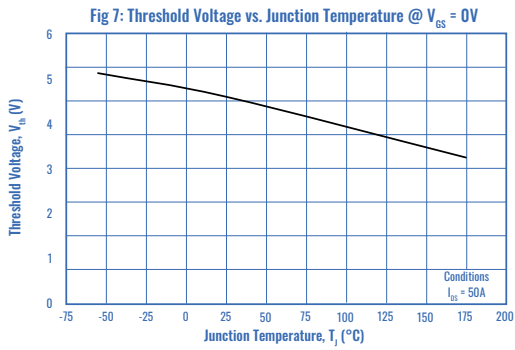
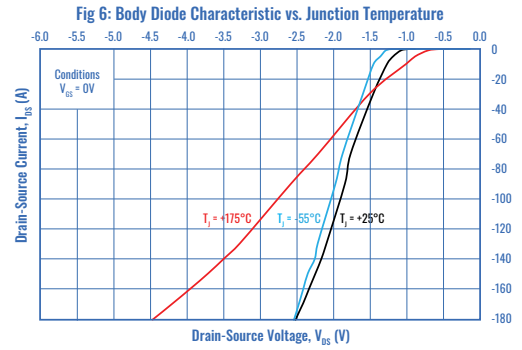
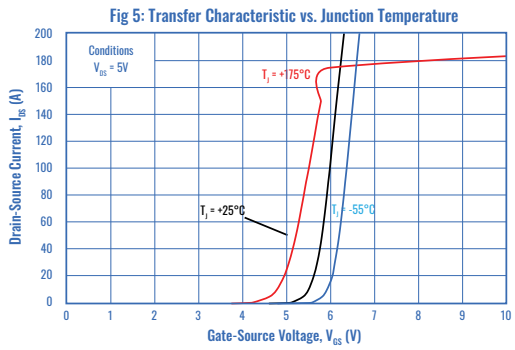
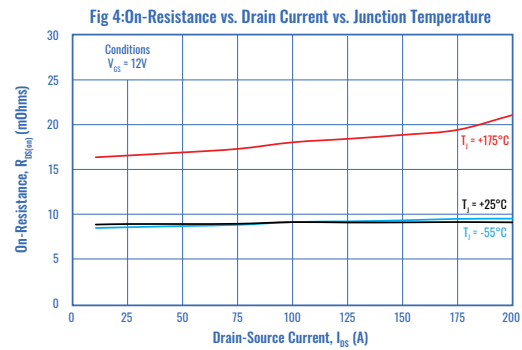
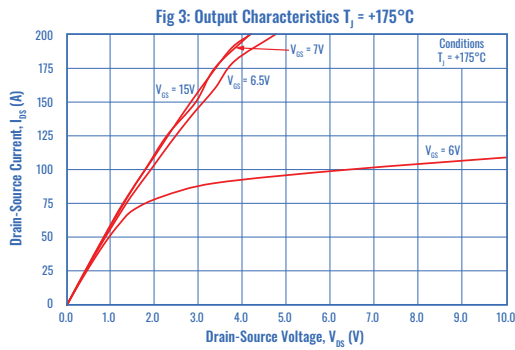
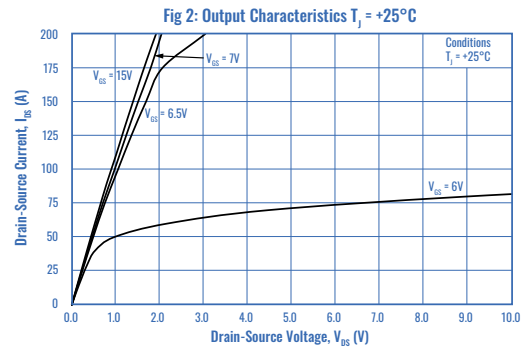
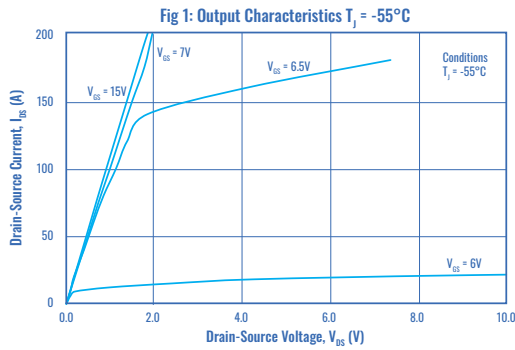
**ELECTRICAL CHARACTERISTICS - REVERSE DIODE ( $T_c = 25^\circ\text{C}$ )**

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_S$	Diode Continuous Forward Current	$T_c < 110^\circ\text{C}$			120	A
$I_{S(pulse)}$	Diode Pulse Current				550	A
$V_{FSD}$	Forward Voltage	$V_{GS} = 0\text{V}$ , $I_F = 100\text{A}$ , $T_j = 25^\circ\text{C}$		1.65	2	V
		$V_{GS} = 0\text{V}$ , $I_F = 100\text{A}$ , $T_j = 175^\circ\text{C}$		2.4		
$Q_{rr}$	Reverse Recovery Charge	$V_R = 800\text{V}$ , $I_F = 100\text{A}$ , $V_{GS} = -5\text{V}$ , $R_{G,EXT} = 22\ \Omega$ , $di/dt = 3700\text{A}/\mu\text{V}$ , $T_j = 25^\circ\text{C}$		1373		nC
		$V_R = 800\text{V}$ , $I_F = 100\text{A}$ , $V_{GS} = -5\text{V}$ , $R_{G,EXT} = 22\ \Omega$ , $di/dt = 3700\text{A}/\mu\text{V}$ , $T_j = 150^\circ\text{C}$		1275		
$t_{rr}$	Reverse Recovery Time	$V_R = 800\text{V}$ , $I_F = 100\text{A}$ , $V_{GS} = -5\text{V}$ , $R_{G,EXT} = 22\ \Omega$ , $di/dt = 3700\text{A}/\mu\text{V}$ , $T_j = 25^\circ\text{C}$		60		ns
		$V_R = 800\text{V}$ , $I_F = 100\text{A}$ , $V_{GS} = -5\text{V}$ , $R_{G,EXT} = 22\ \Omega$ , $di/dt = 3700\text{A}/\mu\text{V}$ , $T_j = 150^\circ\text{C}$		60		

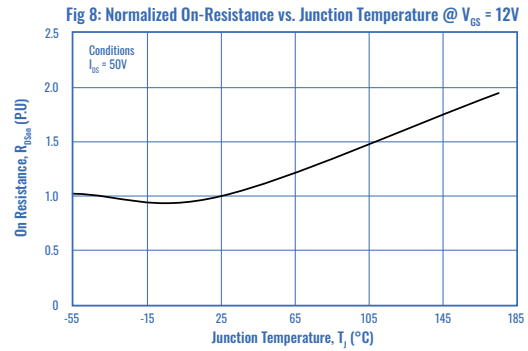
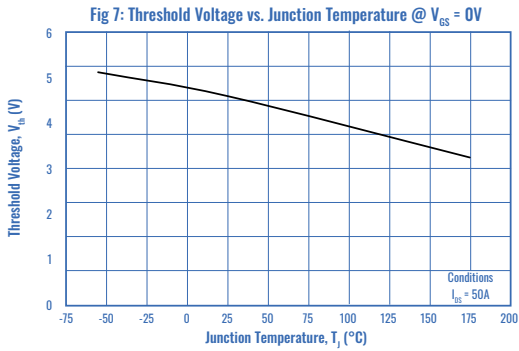
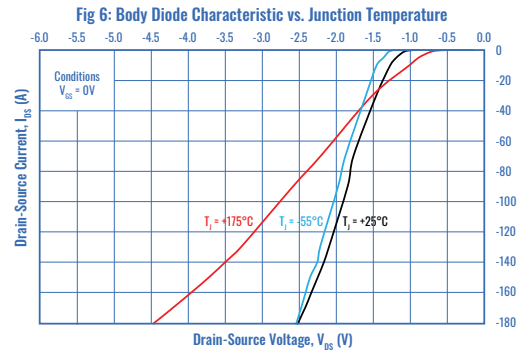
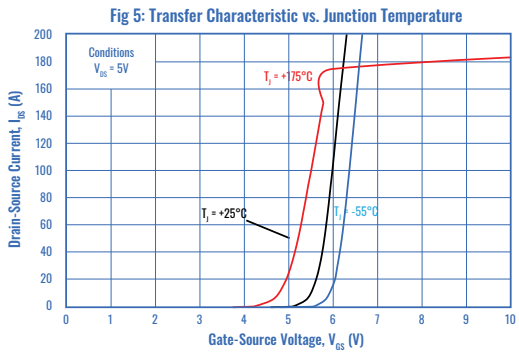
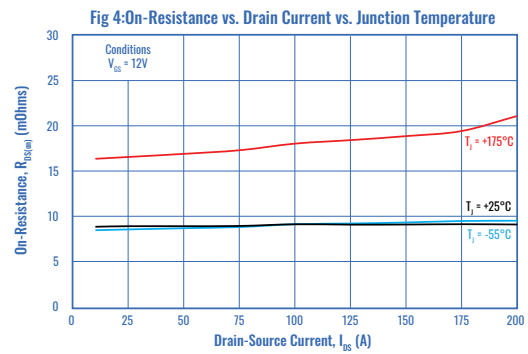
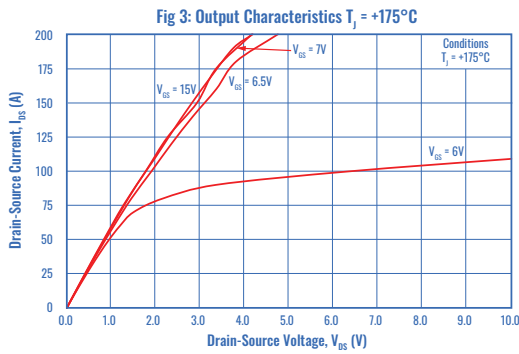
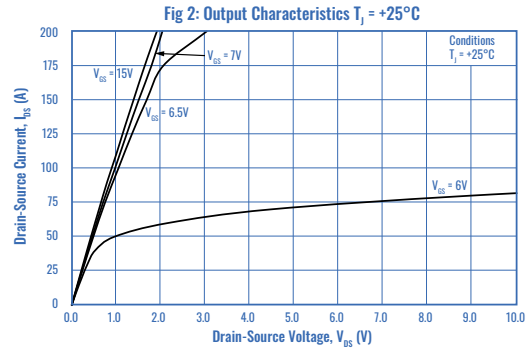
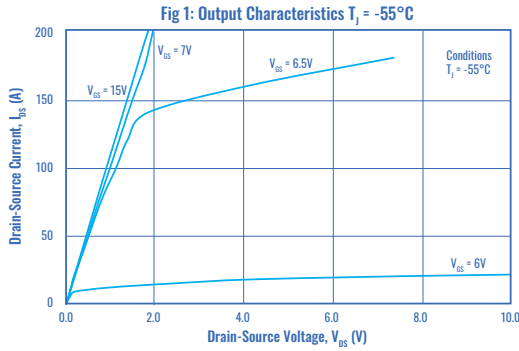
### ELECTRICAL CHARACTERISTICS - DYNAMIC ( $T_c = 25^\circ\text{C}$ )

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
$C_{iss}$	Input Capacitance	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}, f = 100\text{kHz}$		8512		pF	
$C_{oss}$	Output Capacitance			755		pF	
$C_{rss}$	Reverse Transfer Capacitance			9		pF	
$C_{oss(er)}$	Effective Output Capacitance, Energy Related	$V_{DS} = 0\text{V to } 800\text{V}, V_{GS} = 0\text{V}$		395		pF	
$C_{oss(tr)}$	Effective Output Capacitance, Time Related			870		pF	
$E_{oss}$	$C_{oss}$ Stored Energy			128		$\mu\text{J}$	
$Q_G$	Total Gate Charge	$V_{DS} = 800\text{V}, I_D = 100\text{A}, V_{GS} = -5\text{V to } 15\text{V}$		234		nC	
$Q_{GD}$	Gate-Drain Charge			40		nC	
$Q_{GS}$	Gate-Source Charge			96		nC	
$t_{d(on)}$	Turn-on Delay Time	$V_{DS} = 800\text{V}, I_D = 100\text{A}$ Gate Driver = -5V to 15V Turn-on $R_{G,EXT} = 1.5\ \Omega$ Turn-off $R_{G,EXT} = 5\ \Omega$ Inductive Load FWD: same device with $V_{GS} = -5\text{V}, R_G = 5\ \Omega, T_J = 25^\circ\text{C}$		32		ns	
$t_r$	Rise Time			58		ns	
$t_{d(off)}$	Turn-off Delay Time			113		ns	
$t_f$	Fall Time			16		ns	
$E_{ON}$	Turn-on Energy			3463		$\mu\text{J}$	
$E_{OFF}$	Turn-off Energy			722		$\mu\text{J}$	
$E_{TOTAL}$	Total Switching Energy			4185		$\mu\text{J}$	
$t_{d(on)}$	Turn-on Delay Time		$V_{DS} = 800\text{V}, I_D = 100\text{A}$ Gate Driver = -5V to 15V Turn-on $R_{G,EXT} = 1.5\ \Omega$ Turn-off $R_{G,EXT} = 5\ \Omega$ Inductive Load FWD: same device with $V_{GS} = -5\text{V}, R_G = 5\ \Omega, T_J = 150^\circ\text{C}$		28		ns
$t_r$	Rise Time				66		ns
$t_{d(off)}$	Turn-off Delay Time				126		ns
$t_f$	Fall Time			16		ns	
$E_{ON}$	Turn-on Energy			3539		$\mu\text{J}$	
$E_{OFF}$	Turn-off Energy			700		$\mu\text{J}$	
$E_{TOTAL}$	Total Switching Energy			4239		$\mu\text{J}$	
$t_{d(on)}$	Turn-on Delay Time	$V_{DS} = 800\text{V}, I_D = 100\text{A}$ Gate Driver = -5V to 15V Turn-on $R_{G,EXT} = 1.5\ \Omega$ Turn-off $R_{G,EXT} = 5\ \Omega$ Inductive Load FWD: UJ3D1250K, $T_J = 25^\circ\text{C}$			33		ns
$t_r$	Rise Time				50		ns
$t_{d(off)}$	Turn-off Delay Time				113		ns
$t_f$	Fall Time			15		ns	
$E_{ON}$	Turn-on Energy			1895		$\mu\text{J}$	
$E_{OFF}$	Turn-off Energy			680		$\mu\text{J}$	
$E_{TOTAL}$	Total Switching Energy			2575		$\mu\text{J}$	
$t_{d(on)}$	Turn-on Delay Time		$V_{DS} = 800\text{V}, I_D = 100\text{A}$ Gate Driver = -5V to 15V Turn-on $R_{G,EXT} = 1.5\ \Omega$ Turn-off $R_{G,EXT} = 5\ \Omega$ Inductive Load FWD: UJ3D1250K, $T_J = 150^\circ\text{C}$		33		ns
$t_r$	Rise Time				52		ns
$t_{d(off)}$	Turn-off Delay Time				127		ns
$t_f$	Fall Time			15		ns	
$E_{ON}$	Turn-on Energy			1989		$\mu\text{J}$	
$E_{OFF}$	Turn-off Energy			595		$\mu\text{J}$	
$E_{TOTAL}$	Total Switching Energy			2584		$\mu\text{J}$	

### TYPICAL PERFORMANCE CHARACTERISTICS



### TYPICAL PERFORMANCE CHARACTERISTICS, CONT.



#### PACKAGE OUTLINE - dimensions in inches (mm)

