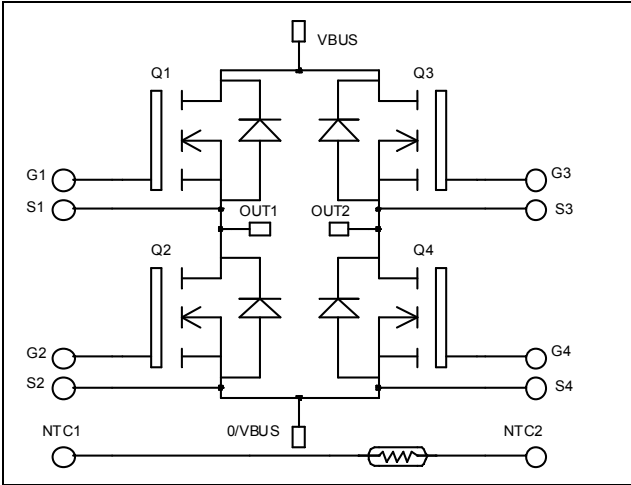


**Full - Bridge
MOSFET Power Module**

**$V_{DSS} = 200V$
 $R_{DSon} = 20m\Omega \text{ max @ } T_j = 25^\circ C$
 $I_D = 89A \text{ @ } T_c = 25^\circ C$**

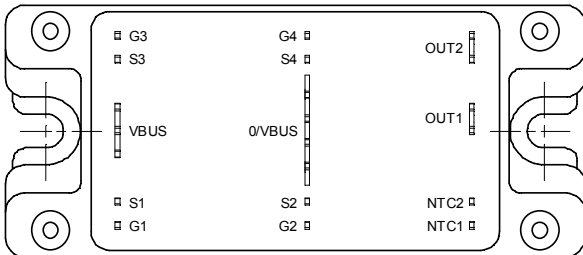


Application

- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies

Features

- Power MOS 7® FREDFETs
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Fast intrinsic reverse diode
 - Avalanche energy rated
 - Very rugged
- Kelvin source for easy drive
- Very low stray inductance
 - Symmetrical design
 - Lead frames for power connections
- Internal thermistor for temperature monitoring
- High level of integration



Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Solderable terminals both for power and signal for easy PCB mounting
- Low profile

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	200	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	89
		$T_c = 80^\circ C$	66
I_{DM}	Pulsed Drain current	356	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	20	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	357
I_{AR}	Avalanche current (repetitive and non repetitive)	89	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	2500	

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

All ratings @ $T_j = 25^\circ\text{C}$ unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
BV_{DSS}	Drain - Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	200			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 200V, T_j = 25^\circ\text{C}$			250	μA
		$V_{GS} = 0V, V_{DS} = 160V, T_j = 125^\circ\text{C}$			1000	
$R_{DS(on)}$	Drain - Source on Resistance	$V_{GS} = 10V, I_D = 44.5A$			20	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 2.5mA$	3		5	V
I_{GSS}	Gate - Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			± 100	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1MHz$		6850		pF
C_{oss}	Output Capacitance			2180		
C_{rss}	Reverse Transfer Capacitance			97		
Q_g	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 100V$ $I_D = 75A$		112		nC
Q_{gs}	Gate - Source Charge			43		
Q_{gd}	Gate - Drain Charge			47		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{GS} = 15V$ $V_{Bus} = 133V$ $I_D = 75A$ $R_G = 5\Omega$		28		ns
T_r	Rise Time			56		
$T_{d(off)}$	Turn-off Delay Time			81		
T_f	Fall Time			99		
E_{on}	Turn-on Switching Energy ❶	Inductive switching @ 25°C $V_{GS} = 15V, V_{Bus} = 133V$ $I_D = 75A, R_G = 5\Omega$		463		μJ
E_{off}	Turn-off Switching Energy ❷			455		
E_{on}	Turn-on Switching Energy ❶	Inductive switching @ 125°C $V_{GS} = 15V, V_{Bus} = 133V$ $I_D = 75A, R_G = 5\Omega$		608		μJ
E_{off}	Turn-off Switching Energy ❷			531		

Source - Drain diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I_S	Continuous Source current (Body diode)		$T_c = 25^\circ\text{C}$		89	A
			$T_c = 80^\circ\text{C}$		66	
V_{SD}	Diode Forward Voltage	$V_{GS} = 0V, I_S = -75A$			1.3	V
dv/dt	Peak Diode Recovery ❸				8	V/ns
t_{rr}	Reverse Recovery Time	$I_S = -75A$ $V_R = 133V$	$T_j = 25^\circ\text{C}$		220	ns
			$T_j = 125^\circ\text{C}$		420	
Q_{rr}	Reverse Recovery Charge	$di/dt = 100A/\mu s$	$T_j = 25^\circ\text{C}$	1.07		μC
			$T_j = 125^\circ\text{C}$	2.9		

❶ E_{on} includes diode reverse recovery.

❷ In accordance with JEDEC standard JESD24-1.

❸ dv/dt numbers reflect the limitations of the circuit rather than the device itself.

$$I_S \leq -75A \quad di/dt \leq 700A/\mu s \quad V_R \leq V_{DSS} \quad T_j \leq 150^\circ\text{C}$$

Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
R _{thJC}	Junction to Case			0.35	°C/W	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, I _{isol} <1mA, 50/60Hz	2500			V	
T _J	Operating junction temperature range	-40		150	°C	
T _{STG}	Storage Temperature Range	-40		125		
T _C	Operating Case Temperature	-40		100		
Torque	Mounting torque		To Heatsink	M5	4.7	N.m
Wt	Package Weight				160	g

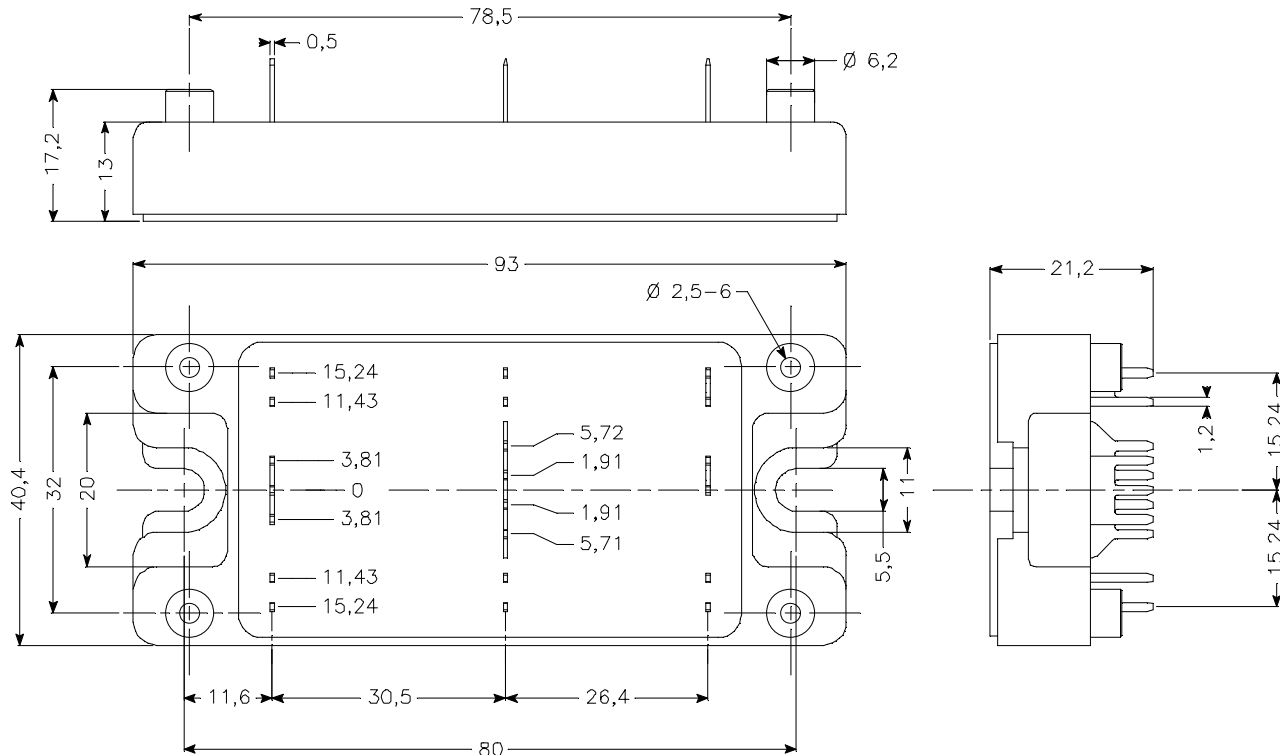
Temperature sensor NTC

Symbol	Characteristic	Min	Typ	Max	Unit
R ₂₅	Resistance @ 25°C		68		kΩ
B _{25/85}	T ₂₅ = 298.16 K		4080		K

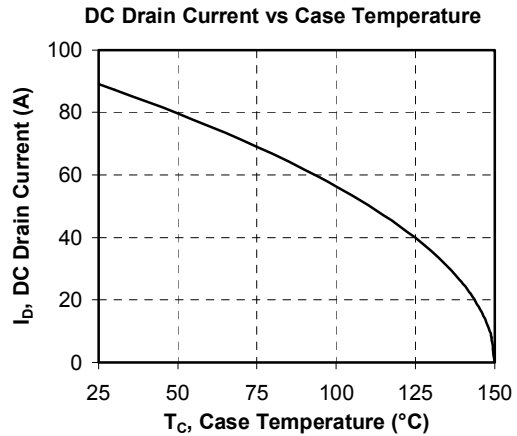
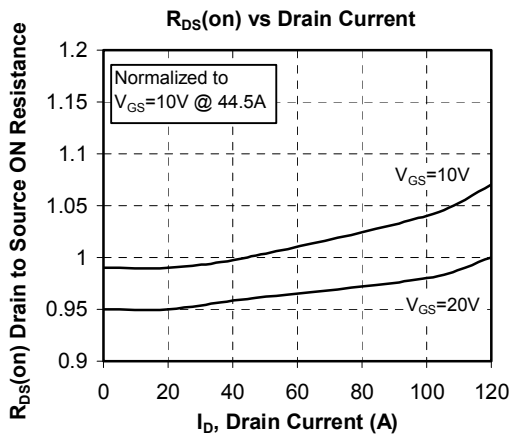
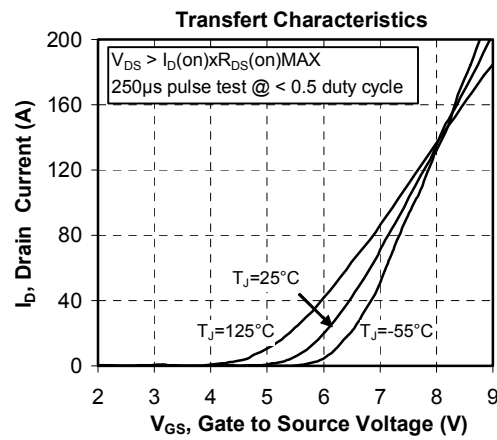
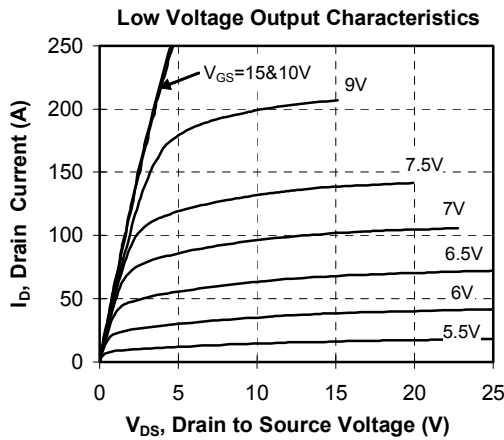
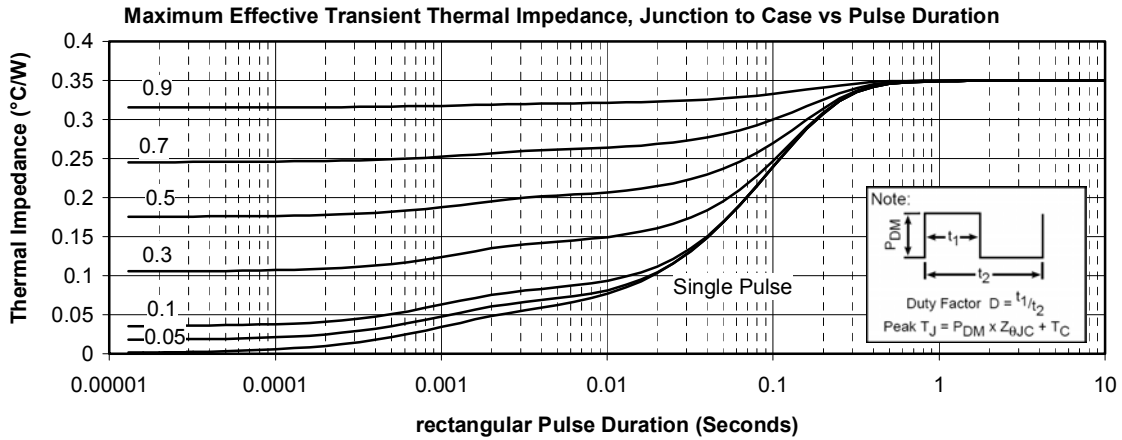
$$R_T = \frac{R_{25}}{\exp \left[B_{25/85} \left(\frac{1}{T_{25}} - \frac{1}{T} \right) \right]}$$

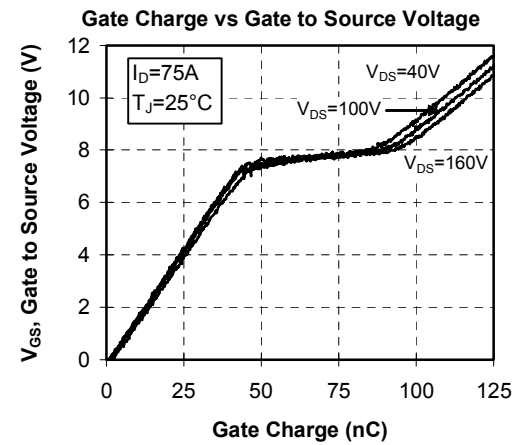
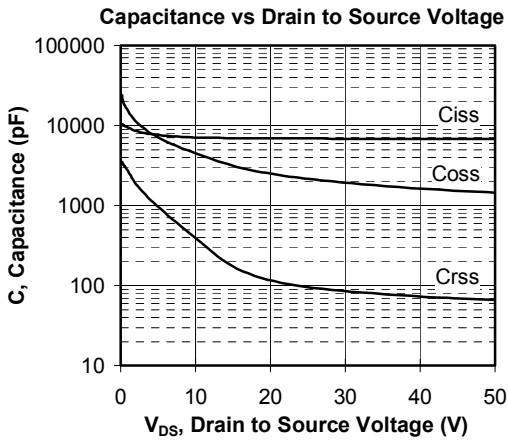
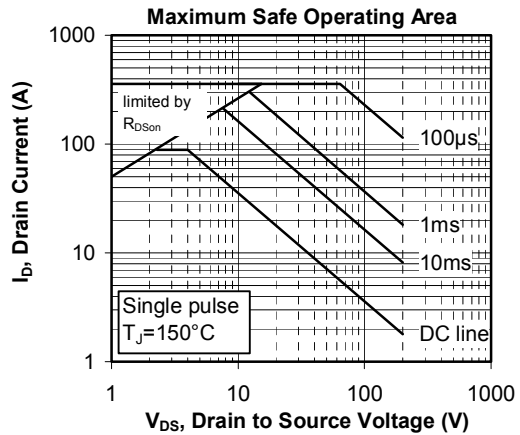
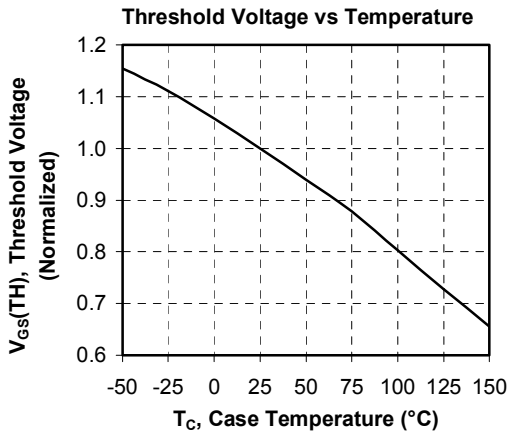
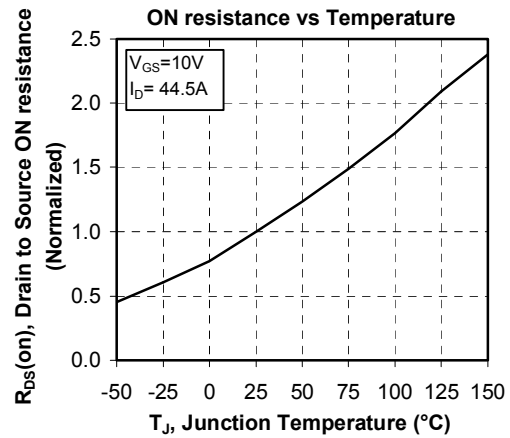
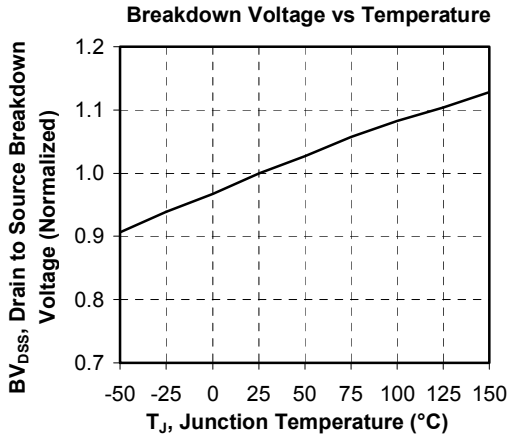
T: Thermistor temperature
R_T: Thermistor value at T

Package outline

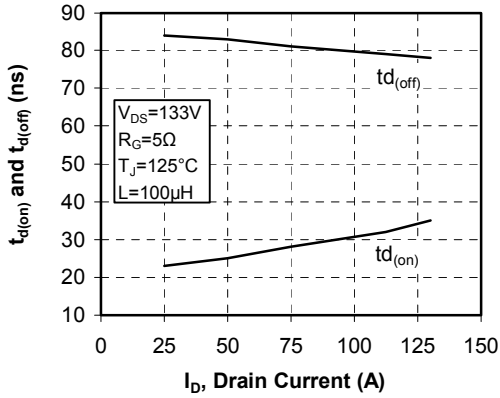


Typical Performance Curve

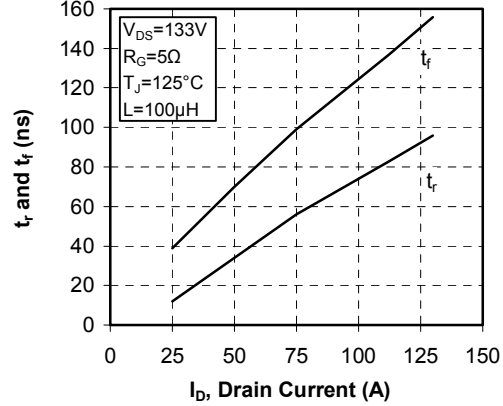




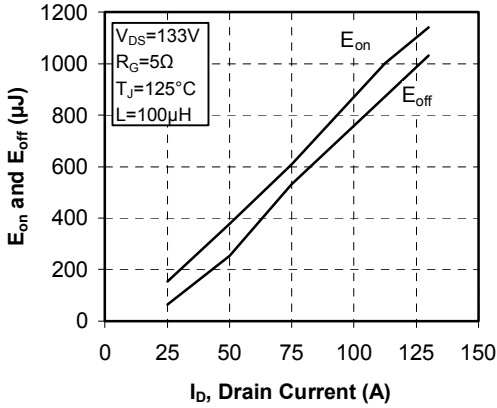
Delay Times vs Current



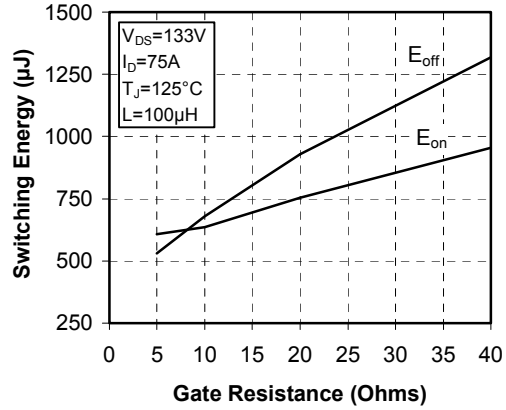
Rise and Fall times vs Current



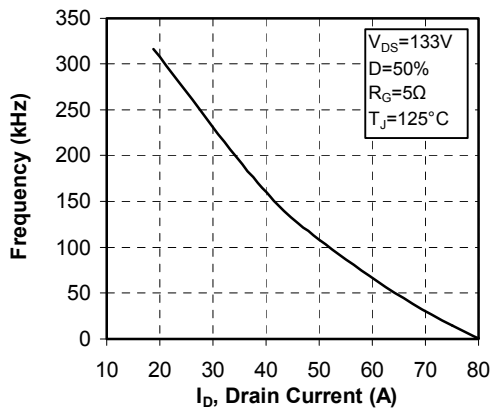
Switching Energy vs Current



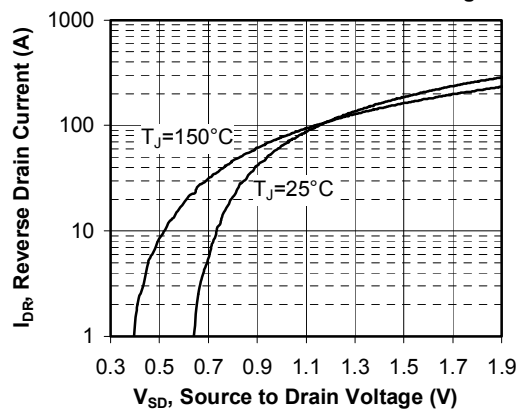
Switching Energy vs Gate Resistance



Operating Frequency vs Drain Current



Source to Drain Diode Forward Voltage



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