Trench gate field-stop IGBT
1200V M series

New M series IGBTs increase energy efficiency and ruggedness for solar and industrial power applications

Based on the third generation at 1200 V for IGBTs in ST's proprietary trench gate field-stop technology, the M series increases the efficiency of UPS, solar, welding and industrial drive applications. Working up to 20 kHz in hard-switching topologies thanks to the optimal trade-off between on state conduction and switching performance, these devices also offers outstanding robustness and EMI characteristics.

KEY FEATURES

- 10 us minimum short circuit capability at starting T_J of 150°C
- 175 °C maximum operating junction temperature (T_J)
- The lowest overall losses up to 20 kHz

KEY BENEFITS

- M series is tailored to improve efficiency of targeted applications
- Longer lifetime
- Safe paralleling
- Soft and fast recovery antiparallel diode
- High robustness

MAIN APPLICATIONS

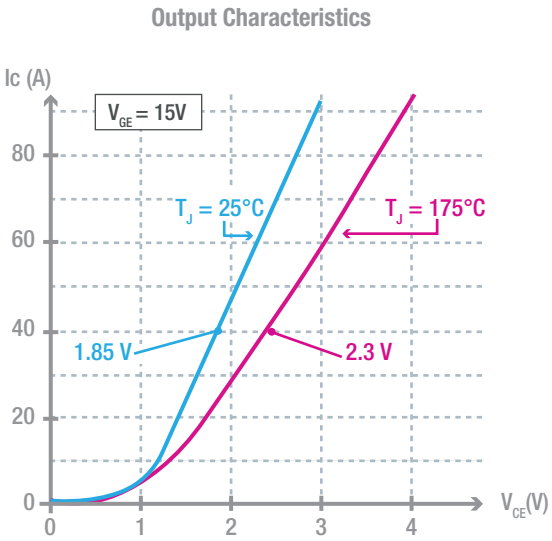
- Motor Control
- Industrial drives
- UPS
- Solar inverters
- Welding

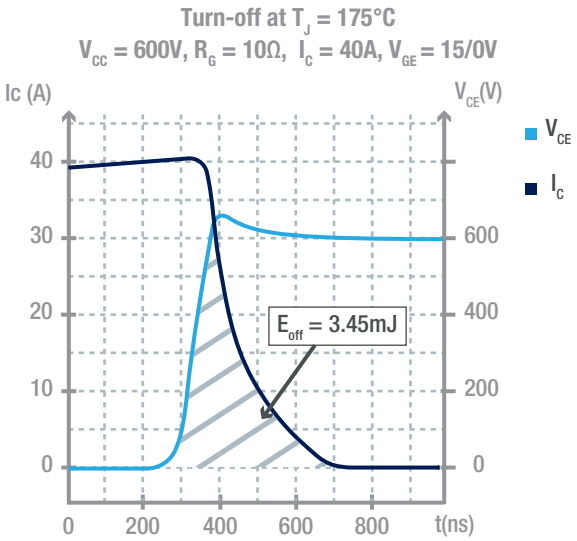
1200V M SERIES IGBTs

STGW40M120DF3 OUTPUT CHARACTERISTICS AND SWITCHING OFF

The typical output characteristics and switching-off are showed below.
On the left, the typical output characteristics for the STGWA40M120DF3 at both 25°C and 175°C. As shown below a positive derating of $V_{CE(sat)}$ is resulting: from 1.85V at 25°C to 2.3V at 175°C.
On the right, the typical switching-off is showed. Despite the extremely high temperature of 175°C, the switching-off loss are limited and no important tail current is resulting. This to show the best compromise between conduction and switching ideal for any industrial drive applications working up to 20 kHz in hard-switching circuitries.

TYPICAL CURVES





DEVICE SUMMARY

IGBT P/Ns	BVces	I_{CN} [1]	$V_{ce(sat)}$ [2]	E_{on} [3]	E_{off} [3]	t_{sc} [4]	Max. operating TJ	Package: TO-247	Package: TO-247 LL
	[V]	[A]	[V]	[mJ]	[mJ]	[µs]	[°C]		
STGx8M120DF3	1200	8	1.85	0.39	0.37	10	175	W	WA
STGx15M120DF3		15		0.55	0.85			W	WA
STGx25M120DF3		25		0.85	1.3			W	WA
STGx40M120DF3		40		1.5	2.25			W	WA

1) I_{CN}: Nominal collector current @ T_J=100°C
2) $V_{ce(sat)}$: Typical conduction losses @ I_{CN}, T_J=25°C
3) E_{on} / E_{off}: Typical switching energy losses @ I_{CN}, T_J=25°C, V_{CC}=600V
4) t_{sc}: min short circuit whitstand time @ V_{CC}≤600V, $T_{J\text{-}start}$≤150°C, V_{GE}= 15V

For more information on IGBT products and solution download and consult the APP ST-IGBT-Finder

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