



DMTH6004SCTB

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _C = +25°C (Note 9)
60V	3.4mΩ @ V _{GS} = 10V	100A

Description

This new generation MOSFET features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

Applications

- Engine Management Systems
- Body Control Electronics
- DC-DC Converters

60V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET

Features

- Rated to +175°C Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching Ensures More Reliable and Robust End Application
- Low R_{DS(ON)} Minimizes Power Losses
- Low Q_g Minimizes Switching Losses
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- An Automotive-Compliant Part is Available Under Separate Datasheet (<u>DMTH6004SCTBQ</u>)

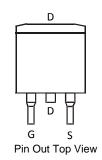
Mechanical Data

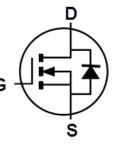
- Case: TO263AB
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 1.7 grams (Approximate)

TO263AB



Top View





Internal Schematic

Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH6004SCTB-13	TO263AB	800 / Tape & Reel

1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.

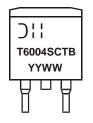
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.

3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

Notes:



T6004SCTB = Product Type Marking Code YYWW = Date Code Marking YY = Last Two Digits of Year (ex: 15 = 2015) WW = Week (01 to 53)



Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V _{DSS}	60	V	
Gate-Source Voltage	V _{GSS}	±20	V	
Continuous Drain Current (Note 6)	T _C = +25°C (Note 9)	ID	100	А
	$T_{C} = +100^{\circ}C$.0	100	
Maximum Continuous Body Diode Forward Current (Note 6)	T _C = +25°C	IS	100	A
Pulsed Drain Current (10µs Pulse, Duty Cycle=1%)	IDM	200	A	
Avalanche Current, L=0.2mH	I _{AS}	45	A	
Avalanche Energy, L=0.2mH	E _{AS}	200	mJ	

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	PD	4.7	W
Thermal Resistance, Junction to Ambient (Note 5)		R _{θJA}	32	°C/W
Total Power Dissipation (Note 6)	T _C = +25°C	PD	136	W
Thermal Resistance, Junction to Case (Note 6)		R _{eJC}	1.1	°C/W
Operating and Storage Temperature Range		T _{J,} T _{STG}	-55 to +175	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Turp	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)	Symbol	IVIIII	Тур	IVIdX	Unit	Test condition	
Drain-Source Breakdown Voltage	BV _{DSS}	60		_	V	$V_{GS} = 0V$, $I_D = 1mA$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μA	$V_{DS} = 48V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	V _{GS(TH)}	2		4	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance	R _{DS(ON)}	_	2.9	3.4	mΩ	V _{GS} = 10V, I _D =100A	
Diode Forward Voltage	V _{SD}		_	1.3	V	$V_{GS} = 0V, I_{S} = 100A$	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C _{iss}	-	4,556	—		$V_{DS} = 30V, V_{GS} = 0V$ f = 1MHz	
Output Capacitance	Coss	-	1,383	—	pF		
Reverse Transfer Capacitance	Crss		105.2	—			
Gate Resistance	R _g		0.66	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$	
Total Gate Charge	Qg		95.4	-		$V_{DD} = 30V, I_D = 90A,$ $V_{GS} = 10V$	
Gate-Source Charge	Q _{gs}	_	21.6	—	nC		
Gate-Drain Charge	Q _{gd}	_	20.4	_			
Turn-On Delay Time	t _{D(ON)}	_	13.2	_			
Turn-On Rise Time	t _R	_	11.7	—		$V_{DD} = 30V, V_{GS} = 10V,$ $I_D = 90A, R_G = 3.5\Omega$	
Turn-Off Delay Time	t _{D(OFF)}	_	31	—	ns		
Turn-Off Fall Time	t _F	_	12	—]		
Reverse Recovery Time	t _{RR}	_	50.5	—	ns	L 504 di/dt 1004/up	
Reverse Recovery Charge	Q _{RR}	_	80.8	—	nC	- I _F =50A, di/dt=100A/μs	

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.

6. Thermal resistance from junction to soldering point (on the exposed drain pad).

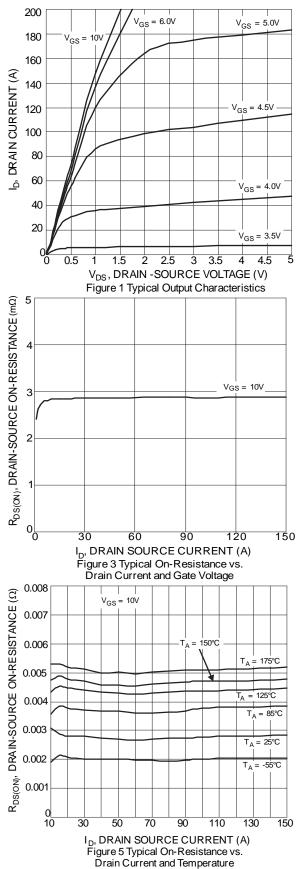
7. Short duration pulse test used to minimize self-heating effect.

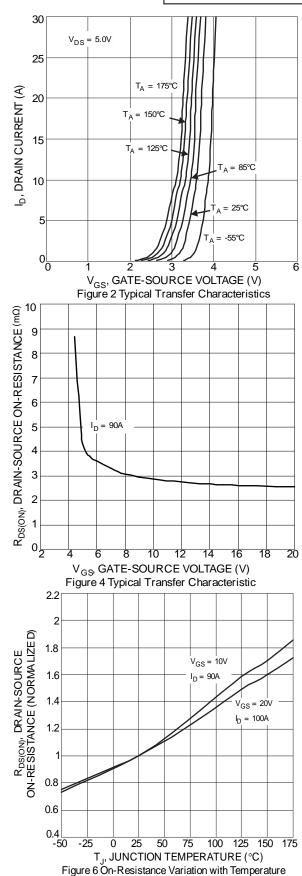
8. Guaranteed by design. Not subject to product testing.

9. Package limited.

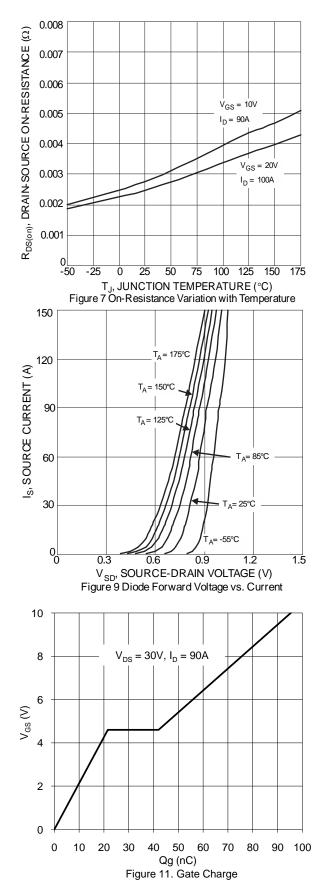


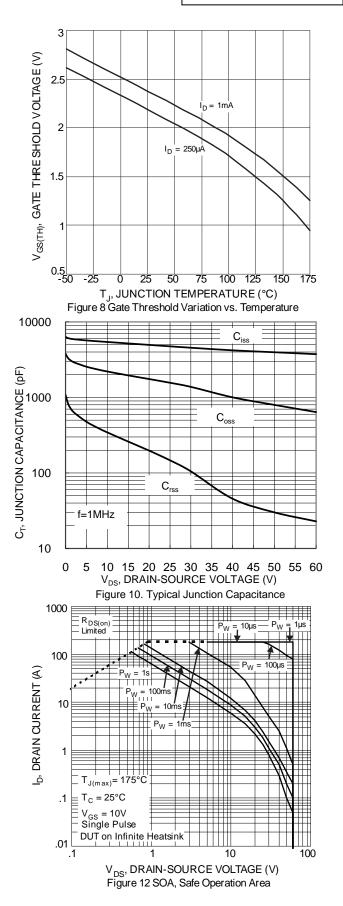






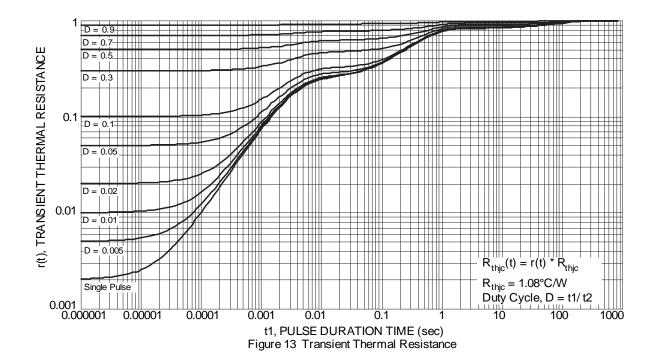






DMTH6004SCTB Document number: DS37382 Rev. 5 - 2

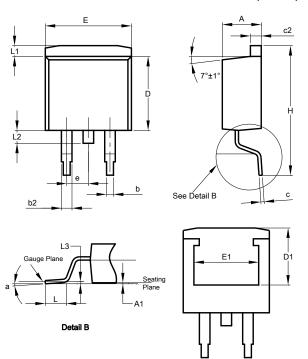






Package Outline Dimensions

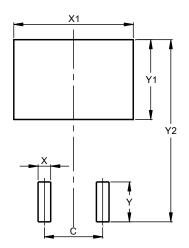
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



TO263AB (D2PAK)					
Dim	Min	Max	Тур		
Α	4.07	4.82	—		
A1	0.00	0.25	_		
b	0.51	0.99	—		
b2	1.15	1.77	_		
С	0.356	0.73	_		
c2	1.143	1.65	_		
D	8.39	9.65	_		
D1	6.55	6.95	_		
е		2.54 TYP			
Е	9.66	10.66			
E1	6.23	8.23	_		
Н	14.61	15.87	_		
L	1.78	2.79	_		
L1	_	1.67	_		
L2	—	1.77	_		
L3		_	0.254		
а	0°	8°	_		
All Dimensions in mm					

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



TO263AB (D2PAK)

Dimensions	Value (in mm)
С	5.08
Х	1.10
X1	10.41
Y	3.50
Y1	7.01
Y2	15.99

TO263AB (D2PAK)



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