



60V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _C = +25°C (Silicon Limited)	I _D T _C = +25°C (Package Limited)
60V	3.4mΩ @ V _{GS} = 10V	163A	100A

Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

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

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
- PPAP Capable (Note 4)

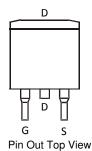
Mechanical Data

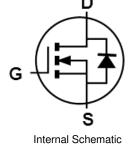
- Case: TO263AB (D2PAK)
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish Matte Tin Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 (23)
- Weight: 1.7 grams (Approximate)

TO263AB (D2PAK)



Top View





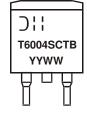
Ordering Information (Note 5)

Part Number	Case	Packaging
DMTH6004SCTBQ-13	TO263AB (D2PAK)	800 / Tape & Reel

Notes:

- 1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
- See http://www.diodes.com/quality/lead_free/ 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to https://www.diodes.com/quality/.
- 5. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



D\\ = Manufacturer's Marking
T6004SCTB = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 18 = 2018)
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 (Silicon Limited, Note 7)	$T_{C} = +25^{\circ}C$ $T_{C} = +100^{\circ}C$	I _D	163 115	Α
Continuous Drain Current (Package Limited, Note7)	$T_{C} = +25^{\circ}C$ $T_{C} = +100^{\circ}C$	I _D	100 100	А
Maximum Continuous Body Diode Forward Current (Note 7) $T_C = +25$ °C		Is	100	Α
Pulsed Drain Current (10µs Pulse, T _C =+25°C, Package Limited)	I _{DM}	400	Α	
Pulsed Body Diode Forward Current (10μs Pulse, T _C =+25°C, Packaç	I _{SM}	400	Α	
Avalanche Current, L=0.2mH	I _{AS}	45	Α	
Avalanche Energy, L=0.2mH	E _{AS}	200	mJ	

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 6) $T_A = +25^{\circ}C$		P _D	4.7	W
Thermal Resistance, Junction to Ambient (Note 6)		$R_{\theta JA}$	32	°C/W
Total Power Dissipation (Note 7) $T_C = +25^{\circ}C$		P _D	136	W
Thermal Resistance, Junction to Case (Note 7)		R _{eJC}	1.1	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +175	°C

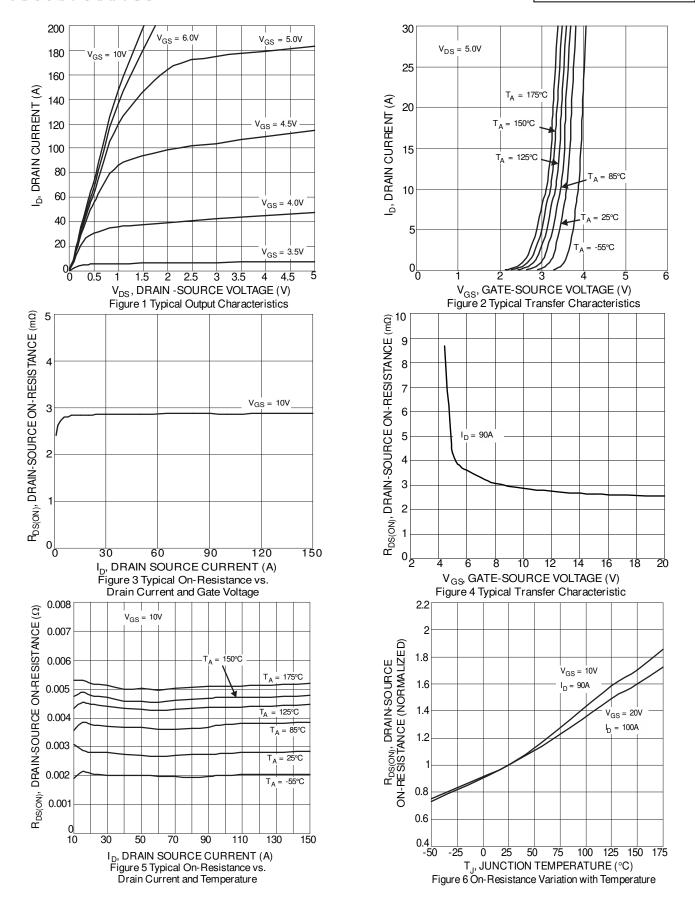
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	60	_	_	V	$V_{GS} = 0V$, $I_D = 1mA$	
Zero Gate Voltage Drain Current (Note 9)	I _{DSS}	_	_	1	μΑ	$V_{DS} = 48V, V_{GS} = 0V$	
Zero Gate Voltage Drain Current (Note 9)		_	_	100	μΑ	$V_{DS} = 48V, V_{GS} = 0V, T_{J} = 125^{\circ}C$	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
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 9)							
Input Capacitance	Ciss	_	4,556	_		.,	
Output Capacitance	Coss	_	1,383	_	pF	$V_{DS} = 30V, V_{GS} = 0V$ f = 1MHz	
Reverse Transfer Capacitance	C _{rss}	_	105.2	_		I = IIVIMZ	
Gate Resistance	Rg	0.1	0.66	1.9	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge	Q_g	_	95.4	_		V 00V I 00A	
Gate-Source Charge	Q _{qs}	_	21.6	_	nC	$V_{DD} = 30V, I_D = 90A,$ $V_{GS} = 10V$	
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/	
Reverse Recovery Charge	Q _{RR}	_	80.8	_	nC	I _F =50A, di/dt=100A/μs	

6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
7. Thermal resistance from junction to soldering point (on the exposed drain pad).
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

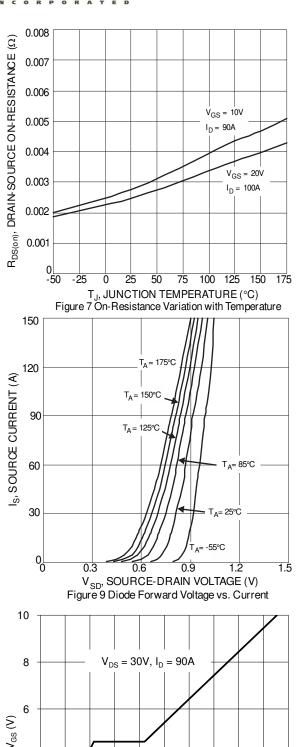


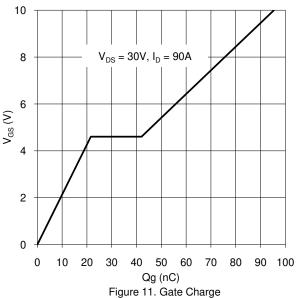


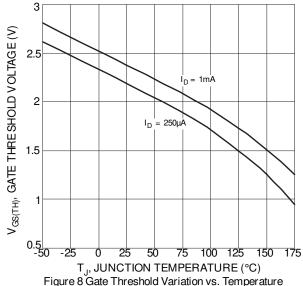


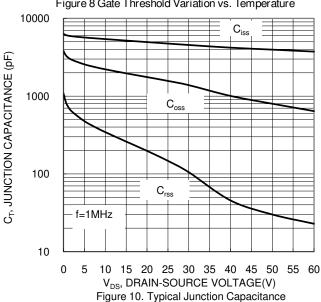


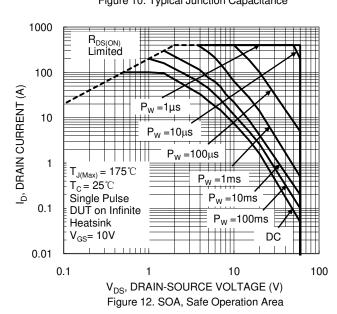




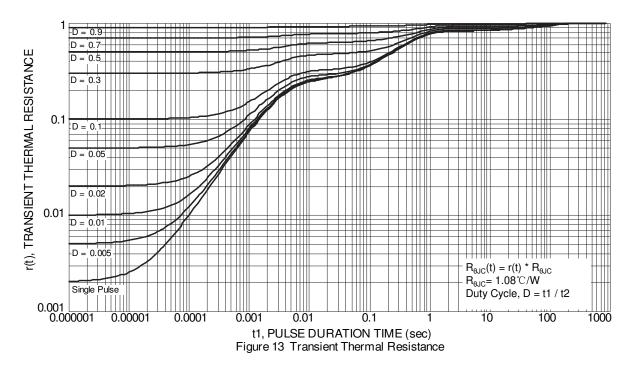










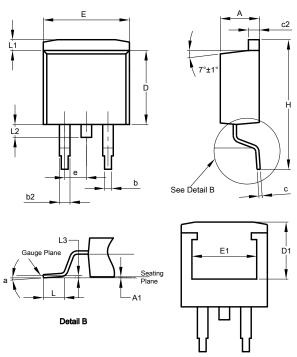




Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

TO263AB (D2PAK)

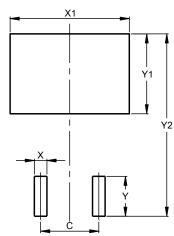


TO263AB (D2PAK)				
Dim	Min	Max	Тур	
Α	4.07	4.82	-	
A 1	A1 0.00 0.25 -		-	
b	0.51	0.99	-	
b2	1.15	1.77	-	
С	0.356	0.73	-	
c2	1.143	1.65	-	
D	8.39	9.65	-	
D1	6.55	6.95	-	
е	2.54 TYP			
Е	9.66 10.66 -		-	
E1	6.23 8.23 -		-	
Н	14.61 15.87 -		-	
L	1.78	2.79	-	
L1	- 1.67 -		-	
L2	- 1.77 -		-	
L3	-	-	0.254	
а	0°	8°	-	
All Dimensions in mm				

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html 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		
V2	15 99		



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